Albers Ranch Project

SCH# 2021100264

Draft Environmental Impact Report

Prepared for
City of Antioch

ANTIOCH
CALIFORNIA

July 2023

Prepared by

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Albers Ranch Project
Draft Environmental Impact Report

SCH# 2021100264

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TABLE OF CONTENTS

TABLE OF CONTENTS

CHAPTER **PAGE**

Appendices

LIST OF FIGURES

FIGURE **PAGE**

3. Project Description

4.0 Introduction to the Analysis

4.2 Transportation

LIST OF TABLES

TABLE **PAGE**

6. Alternatives Analysis

1. Introduction

1. Introduction

1.1 TYPE AND PURPOSE OF THE EIR

The Albers Ranch Project Environmental Impact Report (EIR) has been prepared in accordance with the California Environmental Quality Act (CEQA) of 1970, Public Resources Code [PRC] Section 21000-21178, as amended, and the Guidelines for Implementation of the California Environmental Quality Act, California Code of Regulations [CCR] Title 14, Section 15000-15387 (CEQA Guidelines). The City of Antioch is the lead agency for the environmental review of the Albers Ranch Project (proposed project) evaluated herein and has the principal responsibility for approving the project. As required by Section 15121 of the CEQA Guidelines, this EIR will (a) inform public agency decision-makers, and the public generally, of the significant environmental effects of the project, (b) identify possible ways to minimize the significant adverse environmental effects, and (c) describe reasonable and feasible project alternatives which reduce environmental effects. The public agency shall consider the information in the EIR along with other information that may be presented to the agency.

As provided in the CEQA Guidelines Section 15021, public agencies are charged with the duty to avoid or minimize environmental damage where feasible. The public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social issues. CEQA requires the preparation of an EIR prior to approving any project that may have a significant effect on the environment. For the purposes of CEQA, the term project refers to the whole of an action, which has the potential for resulting in a direct physical change or a reasonably foreseeable indirect physical change in the environment (CEQA Guidelines Section 15378[a]). With respect to the proposed project, the City has determined that the proposed development is a *project* within the definition of CEQA, which has the potential for resulting in significant environmental effects.

The lead agency, which is the City of Antioch for this project, is required to consider the information in the EIR along with any other available information in deciding whether to approve the application. The basic requirements for an EIR include discussions of the environmental setting, environmental impacts, mitigation measures, alternatives, growth-inducing impacts, and cumulative impacts.

The CEQA Guidelines identify several types of EIRs, each applicable to different project circumstances. This EIR has been prepared as a *project-level EIR* pursuant to CEQA Guidelines Section 15161, which is an analysis that examines the environmental impacts of a specific development project. A *project-level EIR* focuses primarily on the changes in the environment that would result from the development of the project, and examines all phases of the project including planning, construction, and operation.

1.2 KNOWN RESPONSIBLE AND TRUSTEE AGENCIES

“Responsible agency” means a public agency that proposes to carry out or approve a project for which a lead agency is preparing or has prepared an EIR or Negative Declaration. For the purpose of CEQA, the term responsible agency includes all California public agencies other than the lead agency that have discretionary approval power over the project or an aspect of the project. The

Bay Area Air Quality Management District (BAAQMD), Central Valley Regional Water Quality Control Board (RWQCB), California Division of Safety of Dams (DSOD), and the Contra Costa County Flood Control District (CCCFCD) would be considered responsible agencies for the proposed project.

"Trustee agency" means a State agency having jurisdiction by law over natural resources affected by a project, which are held in trust for the people of the State of California. The only known possible trustee agency is the California Department of Fish and Wildlife (CDFW).

Although not subject to California law, and, thus, outside the definitions of responsible agency or trustee agency, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Service (USFWS) will also be called upon to grant approvals — under federal law — necessary for the development of the project site. The above agencies do not have duties under CEQA, but, rather, are governed by a variety of federal statutes, such as the Clean Water Act, which governs the dredging and filling of waters of the U.S. (e.g., wetlands), and the Endangered Species Act, which requires USACE to consult with the USFWS as part of the review process for any wetland or fill permits that may be required.

1.3 PROJECT SUMMARY

This section provides an overview of the project location and components. For additional project description details, please refer to Chapter 3, Project Description, of this EIR.

Project Location and Setting

The 96.5-acre site, located east of the Deer Valley Road/Deer Hill Lane intersection in the City of Antioch, is currently undeveloped, consisting primarily of dry-farmed wheat, regularly disked, with native grassland areas. Sand Creek, a tributary to Marsh Creek, is located along the northern border of the site and a reach of Sand Creek extends through the western portion of the project site. The City of Antioch/Contra Costa County line borders the site to the south. The project site is situated within the Sand Creek Focus Area of the General Plan. Per the City's General Plan, the majority of the site is designated Hillside, Estate and Executive Residential/Open Space, while the western portion of the site, alongside Deer Valley Road, is designated Commercial/Open Space. The site is zoned Study District.

The majority of the surrounding area has been approved for residential development. Within the City of Antioch, the area to the north of the site is approved for development with the Aviano Project, the area to the northeast of the site is approved for development with the Promenade/Vineyards at Sand Creek Project, and the area to the east is approved for development for the Creekside/Vineyards at Sand Creek Project. Surrounding existing uses include rural single-family residential development located west of the site, across Deer Valley Road, and vacant CCCFCD property, Upper Sand Creek Basin, and Antioch School District to the north. The area south of the site is undeveloped, consisting of dry farmland outside the City's Sphere of Influence and Planning Area, within unincorporated Contra Costa County.

Project Components

The proposed project would include a multi-generational single-family residential subdivision with 294 units, as well as recreational amenities and associated improvements. The proposed project would also include future development of an assisted living facility and neighborhood commercial development upon issuance of a Conditional Use Permit (CUP). Development of the single-family residential subdivision, assisted living facility, and neighborhood commercial land uses, including proposed roadways, would total approximately 47.4 acres. The remaining 49.1 acres of the site would be retained as open space. The project would require City approval of the following: General Plan Amendment, Master Development Plan/Rezone, Development Agreement, and Vesting Tentative Map (VTM).

A fully detailed project description is provided in Chapter 3, Project Description, of this EIR.

1.4 EIR PROCESS

The EIR process begins with the decision by the lead agency to prepare an EIR, either during a preliminary review of a project or at the conclusion of an Initial Study. Once the decision is made to prepare an EIR, the lead agency sends a Notice of Preparation (NOP) to appropriate government agencies and, when required, to the State Clearinghouse (SCH) in the Office of Planning and Research (OPR), which will ensure that responsible and trustee State agencies reply within the required time. The SCH assigns an identification number to the project, which then becomes the identification number for all subsequent environmental documents on the project. Commenting agencies have 30 days to respond to the NOP and provide information regarding alternatives and mitigation measures they wish to have explored in the Draft EIR and to provide notification regarding whether the agency will be a responsible agency or a trustee agency for the project. An NOP, as well as a detailed Initial Study (see Appendix A), was prepared for the proposed project and circulated from October 15, 2021 to November 15, 2021. A public scoping meeting was held on October 28, 2021 for the purpose of informing the public and receiving comments on the scope of the environmental analysis to be prepared for the proposed project. See Section 1.6 below for a summary of comments received on the NOP.

As soon as the Draft EIR is completed, a Notice of Completion will be filed with the SCH and a public notice of availability will be published to inform interested parties that a Draft EIR is available for agency and public review. In addition, the notice provides information regarding the location of copies of the Draft EIR available for public review and any public meetings or hearings that are scheduled. The Draft EIR will be circulated for a period of 45 days, during which time reviewers may make comments. The lead agency must respond to comments in writing, describing the disposition of any significant environmental issues raised and explaining in detail the reasons for not accepting any specific comments concerning major environmental issues. If significant new information, as defined in CEQA Guidelines Section 15088.5, is added to an EIR after public notice of availability is given but before certification of the EIR, the revised EIR or affected chapters must be recirculated for an additional public review period with related comments and responses.

A Final EIR will be prepared, containing comments and responses to comments on the Draft EIR. The Final EIR will also include any changes to the Draft EIR text made as a result of public comment. Before approving a project, the lead agency shall certify that the Final EIR has been completed in compliance with CEQA, and that the Final EIR has been presented to the decision-making body of the lead agency, which has reviewed and considered the EIR. The lead agency shall also certify that the Final EIR reflects the lead agency's independent judgment and analysis.

The findings prepared by the lead agency must be based on substantial evidence in the administrative record and must include an explanation that bridges the gap between evidence in the record and the conclusions required by CEQA. If the decision-making body elects to proceed with a project that would have unavoidable significant impacts, then a Statement of Overriding

Considerations explaining the decision to balance the benefits of the project against unavoidable environmental impacts must be prepared.

1.5 SCOPE OF THE EIR

This EIR constitutes a project-level analysis for the Albers Ranch Project and, pursuant to CEQA Guidelines Section 15161, covers "all phases of the project including planning, construction, and operation." State CEQA Guidelines § 15126.2(a) states, in pertinent part:

> An EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced.

Pursuant to the CEQA Guidelines, the scope of this EIR addresses specific issues and concerns identified as potentially significant in the Initial Study prepared for the proposed project.

Environmental Issues Addressed in this EIR

The sections of the CEQA Guidelines Appendix G Checklist identified for study in this EIR include the following:

- Air Quality and Greenhouse Gas Emissions; and
- Transportation.

The evaluation of effects is presented on a resource-by-resource basis in Chapters 4.1 and 4.2 of the EIR. Each chapter is divided into the following four sections: Introduction, Existing Environmental Setting, Regulatory Context, and Impacts and Mitigation Measures. Impacts that are determined to be significant in Chapters 4.1 and 4.2, and for which feasible mitigation measures are not available to reduce those impacts to a less-than-significant level, are identified as *significant and unavoidable*. Chapter 5 presents a discussion of growth-inducing impacts, a summary of cumulative impacts, and significant irreversible as well as significant unavoidable environmental changes associated with the project. Alternatives to the proposed project are discussed in Chapter 6 of this EIR.

1.6 COMMENTS RECEIVED ON THE NOTICE OF PREPARATION

During the NOP public review period from October 15, 2021 to November 15, 2021, the City of Antioch received three comment letters. Verbal comments were not received at the public scoping meeting held on October 28, 2021. A copy of each letter submitted is provided in Appendix B to this EIR. The letters regarding the NOP were received from the following public agencies:

- California Department of Transportation — Mark Leong;
- Contra Costa County Flood Control and Water Conservation District — Joe Smithonic; and
- Native American Heritage Commission — Katy Sanchez.

The following list, categorized by issue, summarizes the concerns brought forth in the comment letters and verbal comments received on the scope of the EIR:

Air Quality and Greenhouse Gas Emissions (Chapter 4.1)	Concerns related to: • Provision of a Transportation Demand Management (TDM) Program to reduce greenhouse gas emissions.
Transportation (Chapter 4.2)	Concerns related to: • Increase in Vehicle Miles Traveled (VMT). • Compliance with the City's adopted VMT policy. • Safe access to the site and to transit facilities for pedestrians, bicyclists, travelers with disabilities, and transit users. • Access to transit connections, types of transit connections, and connection between project site and nearby activity centers. • Implementation of a TDM Program to reduce VMT. • Payment of transportation impact fees.
Initial Study (Appendix A)	Concerns related to: • Compliance with Assembly Bill 52 and Senate Bill 18 requirements. • Contacting the appropriate information centers regarding archaeological records searches and field surveys. • Conducting a Sacred Lands File search and attaining a Native American Tribal Consultation list from the Native American Heritage Commission (NAHC). • Inadvertently discovered Native American cultural items and/or human remains. • Potential for stream and channel erosion due to increased runoff. • Adequacy of storm drain facilities on-site to avoid diversion of the watershed. • Downstream impacts to drainage areas and impacts on the capacity of State facilities due to increased water flow. • Effects on and capacity of existing natural watercourses. • Effects on nearby FC District Basins. • Include Contra Costa County's hydrology and hydrograph standards in a hydrology study for the project. • Impacts of the project's runoff due to the increase in duration of flows and the effect on creeks and channels downstream of the project site. • Proper payment of FC District drainage fees. • Impacts to Sand Creek and its natural stream processes.

Concerns related to air quality and greenhouse gas emissions, as well as transportation are addressed in this EIR. All other issues are discussed in the Initial Study (see Appendix A) prepared for the proposed project.

1.7 DRAFT EIR AND PUBLIC REVIEW

This Draft EIR is being circulated for public review and comment for a period of 45 days. During this period, the general public, organizations, and agencies can submit comments to the Lead Agency on the Draft EIR's accuracy and completeness. Release of the Draft EIR marks the beginning of a 45-day public review period pursuant to CEQA Guidelines Section 15105. The public can review the Draft EIR at the City's website at:

https://www.antiochca.gov/community-development-department/planning-division/environmental-documents/

All comments or questions regarding the Draft EIR should be addressed to:

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1.8 ORGANIZATION OF THE DRAFT EIR

The EIR is organized into the following sections:

Chapter 1 – Introduction

Provides an introduction and overview describing the intended use of the Draft EIR and the review and certification process, as well as summaries of the chapters included in the Draft EIR and summaries of the issues and concerns received from the public and public agencies during the NOP review period.

Chapter 2 – Executive Summary

Summarizes the elements of the project and the environmental impacts that would result from implementation of the proposed project, describes proposed mitigation measures, and indicates the level of significance of impacts after mitigation.

Chapter 3 – Project Description

Provides a detailed description of the proposed project, including the project's location, background information, objectives, and technical characteristics.

Chapter 4.0 – Environmental Setting, Impacts, and Mitigation

Contains a project-level and cumulative analysis of environmental issue areas associated with the proposed project. The section for each environmental issue contains an introduction and description of the setting of the project site, identifies impacts, and recommends appropriate mitigation measures.

Chapter 4.1 – Air Quality and Greenhouse Gas Emissions

The Air Quality and Greenhouse Gas Emissions chapter of the EIR describes the impacts of construction and operation of the proposed project related to air quality and global climate change. The chapter was prepared using methodologies and assumptions recommended by the BAAQMD.

Chapter 4.2 – Transportation

The Transportation chapter of the EIR discusses existing transportation and circulation conditions within the project area and the effects to the roadway network as a result of the proposed project and future, projected growth. The analysis includes consideration of vehicle traffic impacts on roadway capacity for consistency with the General Plan, transit impacts, bicycle impacts, and pedestrian impacts. An analysis of the proposed project's VMT is also included.

Chapter 5 – Statutorily Required Sections

The Statutorily Required Sections chapter of the EIR provides discussions required by CEQA regarding impacts that would result from the proposed project, including a summary of cumulative impacts, potential growth-inducing impacts, significant and unavoidable impacts, and significant irreversible changes to the environment.

Chapter 6 – Alternatives Analysis

The Alternatives Analysis chapter of the EIR describes and evaluates the alternatives to the proposed project. It should be noted that the alternatives will be analyzed at a level of detail less than that of the proposed project; however, the analyses will include sufficient detail to allow for a meaningful comparison of impacts

Chapter 7 – EIR Authors and Persons Consulted

The EIR Authors and Persons Consulted chapter of the EIR lists EIR and technical report authors who provided technical assistance in the preparation and review of the EIR.

Chapter 8 – References

The References chapter of the EIR provides bibliographic information for all references and resources cited.

Appendices

The Appendices include the NOP and Initial Study, comments received during the NOP comment period, and technical reports prepared for the proposed project.

2. Executive Summary

2. Executive Summary

2.1 INTRODUCTION

The Executive Summary chapter of the EIR provides an overview of the Albers Ranch Project (proposed project) and summarizes the conclusions of the environmental analysis provided in Chapters 4.1 and 4.2. In addition, the chapter outlines the mitigation monitoring plan, summarizes the alternatives to the proposed project that are described in the Alternatives Analysis chapter, identifies the Environmentally Superior Alternative, and discusses areas of controversy and issues to be resolved. Table 2-1, found at the end of this chapter, provides a summary of the environmental effects of the proposed project, as identified in each technical chapter of this EIR and the Initial Study prepared for the project (see Appendix A). Table 2-1 also contains the potential environmental impacts associated with the proposed project, the significance of the impacts, the proposed mitigation measures for the impacts, and the significance of the impacts after implementation of the mitigation measures.

2.2 SUMMARY DESCRIPTION OF THE PROPOSED PROJECT

The 96.5-acre site, located east of the Deer Valley Road/Deer Hill Lane intersection in the City of Antioch, is currently undeveloped, consisting primarily of non-native vegetation. The site is identified by Assessor's Parcel Numbers (APNs) 057-042-006 and 057-050-021. Sand Creek, a tributary to Marsh Creek, is located along the northern border of the site and a reach of Sand Creek extends through the western portion of the project site. The City of Antioch/Contra Costa County line borders the site to the south. The project site is situated within the Sand Creek Focus Area of the General Plan. According to the City's General Plan, the majority of the site is designated Hillside, Estate and Executive Residential/Open Space, while the western portion of the site, alongside Deer Valley Road, is designated Commercial/Open Space. The entire project site is zoned Study District.

The proposed project would include development of a single-family residential subdivision with 294 units, as well as recreational amenities and associated improvements. The proposed project would also include future development of an assisted living facility and neighborhood commercial development upon issuance of a Conditional Use Permit (CUP). Development of the single-family residential subdivision, assisted living facility, and neighborhood commercial land uses, including proposed roadways, would total approximately 47.4 acres. The remaining 49.1 acres of the site would be retained as open space.

The proposed project would require City approval of the following:

- General Plan Amendment. The proposed project would require approval of a General Plan text and map amendment to the Sand Creek Focus Area of the General Plan to change the land use designations of the site from Hillside, Estate and Executive Residential/Open Space and Commercial/Open Space to Medium Low Density Residential/Open Space and Commercial/Open Space. A text amendment to the Sand Creek Focus Area of the General Plan would also be required to add the Albers Ranch Sub Area to the Sand Creek Focus Area.

- Master Development Plan/Rezone/Development Agreement. The proposed project would require a rezone from Study District to Hillside Planned Development (HPD). HPD would include development standards for the project. The Development Agreement would allow the City and the applicant to enter into an agreement to assure the City that the proposed project would be completed in compliance with the plans submitted by the applicant, and assure the applicant of vested rights to develop the project.
- Vesting Tentative Map. The proposed project would require approval of a Vesting Tentative Map for the subdivision of the project site into multiple parcels to accommodate 294 single-family residential units, a parcel for a potential future assisted living facility and neighborhood commercial land uses, and recreation, parks, and open space.
- Resource Management Plan. Pursuant to Section 4.4.6.7(t) of the City of Antioch General Plan, the applicant will prepare a Resource Management Plan for City approval.

In addition to approvals from the City of Antioch, the proposed project may require approvals/permits from the following State, federal, or local agencies:

- Bay Area Air Quality Management District (BAAQMD);
- California Department of Fish and Wildlife (CDFW);
- California Division of Safety of Dams (DSOD);
- Central Valley Regional Water Quality Control Board (RWQCB);
- Contra Costa County Flood Control District (CCCFCD);
- U.S. Army Corps of Engineers (USACE); and
- U.S. Fish and Wildlife Service (USFWS).

Please refer to Chapter 3, Project Description, of this EIR for a detailed description of the proposed project and entitlements, as well as a full list of the project objectives.

2.3 ENVIRONMENTAL IMPACTS AND PROPOSED AND RECOMMENDED MITIGATION

Under CEQA, a significant effect on the environment is defined as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, mineral, flora, fauna, ambient noise, and objects of historic or aesthetic significance. Mitigation measures must be implemented as part of the proposed project to reduce potential adverse impacts to a less-than-significant level. Such mitigation measures are noted in this EIR and are found in the Initial Study prepared for the proposed project (see Appendix A) and the following technical chapters: Air Quality and Greenhouse Gas Emissions, and Transportation. The mitigation measures presented in the EIR and Initial Study will form the basis of the Mitigation Monitoring and Reporting Program. Any impact that remains significant after implementation of mitigation measures is considered a significant and unavoidable impact.

A summary of the identified impacts in the technical chapters of the EIR is presented in Table 2-1. The table also includes a summary of those impacts identified in the Initial Study prepared for the proposed project as requiring mitigation. In addition, Table 2-1 includes the level of significance of each impact, any mitigation measures required for each impact, and the resulting level of significance after implementation of mitigation measures for each impact.

2.4 SUMMARY OF PROJECT ALTERNATIVES

The following section presents a summary of the evaluation of the alternatives considered for the proposed project, which include the following:

- No Project (No Build) Alternative;
- Buildout Pursuant to Existing Land Use Designations Alternative;
- Reduced Density Alternative; and
- Reduced Footprint Alternative.

For a more thorough discussion of project alternatives, refer to Chapter 6, Alternatives Analysis, of this EIR.

No Project (No Build) Alternative

The No Project (No Build) Alternative is defined as the continuation of the existing conditions of the project site, which currently consists primarily of ruderal grasses and is absent of structures. The No Project (No Build) Alternative would not require grading or ground disturbance within the project site. However, the City's General Plan identifies the site as an area suitable for development. The No Project (No Build) Alternative would not fulfill the stated aims of the City's General Plan or the project's objectives. Because changes would not occur to the project site under the No Project (No Build) Alternative, environmental impacts would not occur.

Buildout Pursuant to Existing Land Use Designations Alternative

The Buildout Pursuant to Existing Land Use Designations Alternative would consist of buildout of the project site per the current City of Antioch General Plan land use designations at the maximum allowable densities. Per the City's General Plan, the majority of the site is designated Hillside, Estate and Executive Residential/Open Space, while the western portion of the site, alongside Deer Valley Road, is designated Commercial/Open Space. It should be noted that the project site contains substantial constraints to development, such as excessive slopes and the Sand Creek Corridor. Although the site contains the foregoing development constraints, should the applicant find a solution to those constraints, the Alternative would be a viable option. Thus, in order to provide a more accurate comparison of impacts to the proposed project, the Alternative has been included in this EIR. Other alternatives within this chapter reflect development of the site with respect to the existing constraints.

Based on the maximum allowable density for the Hillside, Estate and Executive Residential/Open Space land use designation of 2.0 dwelling units per acre (du/ac), the Alternative would result in a maximum of approximately 127 single-family housing units. For this analysis, the 3.0 acres designated as Commercial/Open Space, were assumed to be developed at a floor-area-ratio (FAR) of 0.5 for a total of 65,340 square feet (sf) of commercial uses to be developed on-site. In addition, the assumption was made that the Alternative would generally include the development of the same amount of streets (13.2 acres) as compared to the proposed project. Similar to the proposed project, the remaining land on-site is assumed to be retained as parks, recreational land, and open space.

The Buildout Pursuant to Existing Land Use Designations Alternative would result in similar impacts related to air quality and greenhouse gas (GHG) emissions compared to the proposed project, but would result in fewer impacts related to transportation.

Reduced Density Alternative

The Reduced Density Alternative would consist of buildout of the project site with half as many residences as the proposed project. As such, the Alternative would develop 147 single-family residential units. The total disturbance area would be identical to the proposed project. Similar to the proposed project, the Alternative would include future development of an assisted living facility and neighborhood commercial development on 3.0 acres, 13.2 acres of streets, and 49.1 acres of parks/open space/recreational/water quality uses. Off-site improvements would also be identical to the proposed project.

The Reduced Density Alternative would result in similar impacts related to air quality and GHG emissions compared to the proposed project, but would result in fewer impacts related to transportation.

Reduced Footprint Alternative

The topography of the site is defined by two large knolls within the western and northeastern portions of the site. As part of the proposed project, the northeastern knoll is not proposed to be developed; however, the western knoll includes the proposed development of a 7.1-acre park as well as 12.1 acres of single-family residences. Under the Reduced Footprint Alternative, the proposed project would not include development within the western knoll. As such, the disturbance area would be reduced by 19.2 acres. The remaining 12 acres of land would be developed at the maximum density allowed under the Medium Density Residential/Open Space land use designation. As such, the Reduced Footprint Alternative would include the development of 120 single-family residential uses. Similar to the proposed project, the Alternative would include future development of an assisted living facility and neighborhood commercial development on 3.0 acres. However, the amount of streets developed as part of the Alternative would be reduced, and the amount of parks/open space/recreational/water quality uses would be increased as compared to the proposed project. Off-site improvements would be identical to the proposed project.

The Reduced Footprint Alternative would result in fewer impacts related to air quality and GHG emissions, as well as transportation.

Environmentally Superior Alternative

An EIR is required to identify the environmentally superior alternative from among the range of reasonable alternatives that are evaluated. Section 15126(e)(2) of the CEQA Guidelines requires that an environmentally superior alternative be designated and states, "If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." The No Project (No Build) Alternative would be considered the environmentally superior alternative, because the project site is assumed to remain in its current condition under the alternative. Consequently, the impacts resulting from the proposed project would not occur under the Alternative.

As discussed throughout the Alternatives Analysis Chapter of this EIR, the Buildout Pursuant to Existing Land Use Designations and the Reduced Density Alternative would result in similar impacts related to air quality and GHG emissions and fewer impacts related to transportation. However, all impacts related to air quality and GHG emissions and transportation would be fewer under the Reduced Footprint Alternative. In addition, although the Reduced Footprint Alternative would still require implementation of mitigation, overall vehicle miles traveled (VMT) as compared to the proposed project would ultimately be less. Nonetheless, impacts related to VMT and GHG emissions would be anticipated to remain significant and unavoidable.

Overall, because the Reduced Footprint Alternative would result in fewer impacts related to air quality and GHG emissions, as well as transportation, the Reduced Footprint Alternative would be considered the environmentally superior alternative to the proposed project.

2.5 AREAS OF CONTROVERSY

The CEQA Guidelines, Section 15123(b), require that this EIR consider areas of controversy known to the lead agency, including issues raised by agencies and the public. Areas of controversy that were identified in NOP comment letters should be considered, as well. The areas of known controversy for the project relate to the following:

- Provision of a Transportation Demand Management (TDM) Program to reduce GHG emissions and VMT.
- Increase in VMT.
- Safe access to the site and to transit facilities for pedestrians, bicyclists, travelers with disabilities, and transit users.
- Access to transit connections, types of transit connections, and connection between project site and nearby activity centers.
- Potential for stream and channel erosion due to increased runoff.
- Adequacy of storm drain facilities on-site to avoid diversion of the watershed.
- Downstream impacts to drainage areas and impacts on the capacity of State facilities due to increased water flow.
- Impacts of the project's runoff due to the increase in duration of flows and the effect on creeks and channels downstream of the project site.
- Effects on and capacity of existing natural watercourses, such as Sand Creek, and the nearby CCCFCD Basins.
- Potential for the presence of tribal cultural resources to be discovered on the project site.

Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
4.1 Air Quality and Greenhouse Gas Emissions			
4.1-1 Conflict with or obstruct implementation of the applicable air quality plan during project construction.	S	*4.1-1 Prior to approval of any grading plans, the project applicant shall show on the plans via notation that the contractor shall ensure that the heavy-duty off-road vehicles (50 horsepower or more) to be used in the construction project, including owned, leased, and subcontractor vehicles, shall achieve a project wide fleet average 28.6 percent NOX reduction compared to the year 2024 California Air Resources Board (CARB) fleet average. The 28.6 percent NOX reduction may be achieved by requiring a combination of engine Tier 3 or Tier 4 off-road construction equipment or the use of hybrid, electric, or alternatively fueled equipment. For instance, the emissions presented in Table 4.1-8 were achieved by requiring graders, scrapers, and rubber-tired dozers to be engine Tier 4.* *In addition, all off-road equipment operating at the construction site must be maintained in proper working condition according to manufacturer's specifications. Idling shall be limited to five minutes or less in accordance with the In-Use Off-Road Diesel Vehicle Regulation as required by CARB. Clear signage regarding idling restrictions shall be placed at the entrances to the construction site.* *Portable equipment over 50 horsepower must have either a valid BAAQMD Permit to Operate (PTO) or*	LS

N/A = *Not Applicable*; LS = *Less-than-Significant*; S = *Significant*; SU = *Significant and Unavoidable; LCC = Less than Cumulatively Considerable; CC = Cumulatively Considerable*

Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		a valid statewide Portable Equipment Registration Program (PERP) placard and sticker issued by CARB. *Conformance with the foregoing requirements shall be included as notes and be confirmed through review and approval of grading plans by the City of Antioch Community Development Department.*	
4.1-2 Conflict with or obstruct implementation of the applicable air quality plan during project operation.	LS	*None required.*	N/A
4.1-3 Expose sensitive receptors to substantial pollutant concentrations.	LS	*None required.*	N/A
4.1-4 Result in other emissions (such as those leading to odors) affecting a substantial number of people.	LS	*None required.*	N/A
4.1-5 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).	LCC	*None required.*	N/A

N/A = *Not Applicable*; LS = *Less-than-Significant*; S = *Significant*; SU = *Significant and Unavoidable; LCC = Less than Cumulatively Considerable; CC = Cumulatively Considerable*

Table 2-1
Summary of Impacts and Mitigation Measures

Impact		Level of Significance Prior to Mitigation	Mitigation Measures		Level of Significance After Mitigation
4.1-6	Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.	CC & S	*4.1-6(a)*	*Prior to the approval of project improvement plans, the applicant shall implement the following measure:* • *Consistent with the BAAQMD's Buildings standard a., natural gas shall be prohibited in proposed structures.* *Compliance with the foregoing measure shall be ensured by the City of Antioch Community Development Department.*	CC & SU
			4.1-6(b)	*Implement Mitigation Measures 4.2-3(a) and 4.2-3(b).*	
4.2 Transportation					
4.2-1	Conflict with a program, plan, ordinance, or policy addressing the circulation system during construction activities.	S	*4.2-1*	*Prior to issuance of grading and building permits, the project applicant shall submit a construction management plan, subject to review and approval by the City Engineer. The requirements within the construction management plan shall include, but are not necessarily limited to, the following elements:* • *Project staging plan to maximize on-site storage of materials and equipment;* • *A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak hours; lane closure proceedings; signs, cones, and other warning devices for drivers; and designation of construction access routes;*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		• *Permitted construction hours;* • *Location of construction staging;* • *Identification of parking areas for construction employees, site visitors, and inspectors, including on-site locations; and* • *Provisions for street sweeping to remove construction related debris on public streets.*	
4.2-2 Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.	S	*4.2-2 The following requirements shall be noted on project improvement plans, subject to review and approval by the City of Antioch Community Development Department:* • *City-standard ADA ramps shall be provided at all internal roadway intersections;* • *Pedestrian paths shall be identified and marked crosswalks shall be installed at key uncontrolled pedestrian crossing locations, such as trail crossings and park connections;* • *The project shall install all-way stop control and high visibility pedestrian crosswalks at the intersection of A Street and C Street;* • *City standard sidewalks shall be installed on A Street connecting the project site to Hillcrest Avenue; and* • *Bicycle parking shall be provided in accordance with Section 9-5.1707 of the City of Antioch Municipal Code for the retail and assisted living portions of the proposed project.*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
4.2-3 Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	S	*4.2-3(a) Prior to issuance of residential building permits, the project applicant shall develop a Transportation Demand Management (TDM) Plan for the residential components of the proposed project, including any anticipated phasing, and shall submit the TDM Plan to the City for review and approval. The TDM Plan shall identify trip reduction strategies as well as mechanisms for funding and overseeing the delivery of trip reduction programs and strategies. Trip reduction strategies applicable to the residential portions of the proposed project may include, but are not limited to, the following:* • *Increase Transit Accessibility;* • *Provide Traffic Calming Measures;* • *Provide Carpooling Programs;* • *Implement Car-Sharing Program;* • *Provide a Transit Riders Guide;* • *Provide an Online TDM Information Center;* • *Increase Bicycle and Pedestrian Facilities/Amenities;* • *Free Trial Rides on Transit Services; and* • *Implement a Subsidized or Discounted Transit Program.* *4.2-3(b) Prior to issuance of building permits for the assisted living facility, the project applicant shall develop a TDM Plan for the assisted living component of the proposed project, including any anticipated phasing,*	SU

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		and shall submit the TDM Plan to the City for review and approval. The TDM Plan shall identify trip reduction strategies as well as mechanisms for funding and overseeing the delivery of trip reduction programs and strategies. Trip reduction strategies applicable to the employment portions of the proposed project may include, but are not limited to, the following: • *Provide Bicycle Maintenance Facilities;* • *Price and Unbundle Parking;* • *Provide Carpooling Programs;* • *Implement Car-Sharing Program;* • *Implement Loaner Bike Program;* • *Provide a Transit Riders Guide;* • *Provide a Dedicated Transportation Coordinator;* • *Provide an Online TDM Information Center;* • *Increase Bicycle and Pedestrian Facilities/Amenities;* • *Increase Transit Accessibility;* • *Provide Secure and Accessible Bike Parking;* • *Free Trial Rides on Transit Services; and* • *Implement a Subsidized or Discounted Transit Program.*	
4.2-4 Substantially increase hazards to vehicle safety due to a geometric design feature (e.g., sharp	LS	*None required.*	N/A

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact		Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
	curves or dangerous intersections) or incompatible uses (e.g., farm equipment).			
4.2-5	Result in inadequate emergency access.	LS	*None required.*	N/A
Initial Study Impacts Requiring Mitigation				
IV-a.	Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	S	*Special-Status Plants* *IV-1. Prior to initiation of ground-disturbing activities on the project site and off-site improvement areas, the project applicant shall retain a qualified biologist to conduct focused botanical surveys for Contra Costa goldfields, alkali milk-vetch, heartscale, brittlescale, lesser saltscale, dwarf downingia, Jepson's coyote-thistle, shining navarretia, bearded popcirnflower, California alkali grass, long-styled sand spurrey, San Joaquin spearscale, and all plants that are considered locally rare as listed in the East Bay Chapter of the CNPS Database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties for the Marsh Creek/Lone Tree Valley area. Project construction shall not be initiated until all special-status plant surveys are completed and the mitigation is implemented, if necessary and required prior to starting construction.* *A special-status plant survey report that includes the methods used, survey participants, and associated findings shall be prepared and submitted to the City no more than 30 days following the completion of the*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		final site visit. A record of any special-status plant species identified within the project site during the preconstruction surveys shall be submitted to the CNDDB. If new special-status plant populations are not found on the site during the appropriately timed surveys, additional mitigation is not required. If construction is not started within two years after the rare plant surveys are completed, the City may require additional rare plant surveys. *If special-status plants are observed on the site during the survey, the populations shall be avoided to the maximum degree possible during project development, and a Mitigation and Monitoring Plan shall be prepared detailing the measures to be implemented to avoid the plant population. Measures shall include establishment of appropriate buffers during construction, fencing of the population prior to and during construction, and regular monitoring of the preserved population by a biologist during and after construction activities. The Mitigation and Monitoring Plan shall be implemented prior to the initiation of project grading. If the plant populations cannot be avoided, the applicant shall hire a qualified biologist to prepare a seed collection and replanting plan in coordination with the City of Antioch to reduce impacts to the identified special-status plant populations, subject to review and approval by the City of Antioch Community Development Department.*	

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Swainson's Hawk *IV-2(a). Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if a Swainson's hawk is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.* *IV-2(b). Prior to any project-related ground disturbance that occurs during the nesting season (March 15th to September 15th) within a half-mile of a potential nest tree, a qualified biologist shall conduct preconstruction surveys within the construction zones and adjacent lands to identify any nesting pairs of Swainson's hawks within 14 days prior to the onset of ground disturbance. Preconstruction surveys are not required for construction activities located farther than a half-mile from a potential nest tree. Surveys shall follow the protocol in the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000), including the survey period lengths identified therein.*	

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		A written summary of the survey results shall be submitted to the City of Antioch Community Development Department. *If active nests are not found during preconstruction surveys, further mitigation is not necessary. If any active nests are discovered in or near proposed construction zones, the qualified biologist shall establish a suitable construction-free buffer around the active nest site. The buffer shall be identified on the ground with flagging or fencing and shall be maintained until the qualified biologist has determined that the young have fledged.* *As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:* *1) Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the East Contra Costa County Habitat Conservancy (Conservancy), provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCCHCP/NCCP Covered Species; or* *2) Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including*	

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Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		payment of applicable fees, provided that CDFW and FWS have approved the conservation plan. *Golden Eagle* *IV-3(a). Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if a golden eagle is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.* *IV-3(b). Prior to initiation of ground-disturbing activities or tree removal, preconstruction surveys shall be conducted concurrently with the preconstruction surveys for Swainson's hawk nests as required by Mitigation Measure IV-2(b) above. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department.* *If no active nesting golden eagles are identified during survey(s), project construction may commence without further regard for protection of*	

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Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		nesting eagles. If active nesting golden eagles are identified during the preconstruction surveys within a half-mile of the site and within the line of sight from disturbance to the nest site, biological monitors shall monitor the nest in order to establish baseline behavioral data. Based on the baseline behavioral data and location of the nest (i.e., whether the nest is remote or in/close to town, and whether existing disturbances are present), a construction-free buffer shall be established. The construction-free buffer shall be a minimum of 800 feet and can be increased based on the biological monitor's observations of the behavior at the nest. Project-related disturbance shall not be allowed within any established buffer until the biologist has determined that the young have fledged. *Burrowing Owl* *IV-4(a). Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if a burrowing owl is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch*	

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Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Community Development Department within two weeks of training completion. *IV-4(b). Prior to initiation of ground-disturbing activities, a preconstruction survey for burrowing owls shall be conducted. The CDFG's Staff Report on Burrowing Owl Mitigation (CDFG 2012) states that take avoidance (preconstruction) surveys shall be conducted within 14 days prior to ground disturbance. As burrowing owls may recolonize a site after only a few days, time lapses between project activities trigger subsequent take avoidance surveys, including, but not limited to, a final survey conducted within 24 hours prior to ground disturbance to ensure absence of the species. Surveys shall ensure 100 percent visual coverage. The results of the survey shall be submitted to the City of Antioch Community Development Department.* *If burrowing owls or fresh sign of burrowing owls are not observed during preconstruction surveys, further mitigation is not required and construction may proceed. If burrowing owls or their recent sign are detected on the site, occupied burrows shall be identified by the monitoring biologist and a construction-free buffer (up to 250 feet) shall be established and maintained until a qualified biologist has determined the burrowing owl has abandoned the burrow.*	

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Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Nesting Migratory Birds, Including Nesting Raptors and Protected Birds *IV-5(a). Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if an active bird nest is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.* *IV-5(b). Prior to commencement of ground-disturbing activities or tree removal during the breeding season (typically between February 1st and August 31st, the project applicant shall retain a qualified biologist to conduct preconstruction migratory bird and raptor nesting surveys within 14 days prior to the onset of ground disturbance. The nesting migratory bird surveys shall cover the project site and the raptor nesting surveys shall encompass the site and lands within 250 feet of the site, where accessible. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department. If nesting migratory birds or raptors are*	

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Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		not identified during the surveys, further mitigation is not required. *If nesting migratory birds or raptors are identified during the surveys, an appropriate construction-free buffer shall be established. The actual size of the buffer, which would be determined by the qualified biologist, will depend on the species, topography, and type of activity that would occur in the vicinity of the nest. The project buffer shall be monitored periodically by the qualified biologist to ensure compliance. Construction or earth-moving activity shall not occur within the established buffer until determined by a qualified biologist that the young have fledged.* *Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp* *IV-6(a). Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if a listed shrimp is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch*	

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Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Community Development Department within two weeks of training completion. *IV-6(b). Prior to initiation of ground-disturbing activities, a protocol-level survey shall be conducted to assess the presence or absence of listed fairy shrimp within the project site. Surveys shall occur in a year wet enough to fill ephemeral wetlands for the USFWS to accept the results of the surveys. Should the surveys confirm absence of listed fairy shrimp, no further action will be necessary.* *Should the surveys identify listed fairy shrimp, to mitigate for permanent impacts to shrimp habitat, the project applicant shall preserve occupied and potentially occupied habitat at a minimum 2:1 ratio (preserved:impacted) and create additional habitat at a minimum 2:1 ratio (created:impacted). Preservation or created habitat shall be via the purchase of mitigation land in fee title or via recordation of a conservation easement over the mitigation land preserving it in perpetuity as wildlife habitat. The easement shall be granted to a qualified conservation organization as defined by Section 815.3 of the California Civil Code. The preserved or created habitat shall be established at least a year prior to on-site impacts to vernal pool fairy shrimp or vernal pool tadpole shrimp habitat in order to monitor the new habitat's effectiveness, including a comparison to the existing on-site habitat with*	

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		regards to appropriate hydrology for shrimp. Once the determination has been made that the created habitat supports the appropriate hydrology, the top four inches of topsoil of the on-site habitat planned to be impacted can be transferred to the mitigation site in the same day. Removal and placement of this topsoil shall be done in a systematic fashion that will avoid compaction of the soil. *Prior to the start of construction, the project applicant shall prepare and submit to the City of Antioch a Habitat Mitigation and Management Plan (HMMP), which shall outline the requirements for managing preserved areas and created areas for five years, as well as success criteria for the created habitat. The HMMP will follow the guidelines for mitigation and monitoring of vernal pools issued by the USFWS (1994). The project applicant shall also establish an endowment fund, or other funding mechanism to provide for the long-term management, maintenance, and monitoring of the mitigation site.* *In lieu of the above, prior to construction, the project applicant may purchase credits at a 1:1 ratio from an approved mitigation bank.* *The project applicant may satisfy the requirements of this mitigation measure by providing the City of Antioch Community Development Department with a copy of a biological opinion issued by the USFWS*	

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		that includes these, or other functionally equivalent, habitat preservation measures prior to the start of construction. *As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:* *1. Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or* *2. Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.* *If breeding habitat is planned to be removed, in addition to evaluating the potential of the project to affect listed fairy shrimp under CEQA, the applicant would need to comply with provisions of the federal Endangered Species Act and would need to seek take authorization from the USFWS for project-related losses as required by law. To obtain a take*	

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		permit, consultation with the USFWS would need to be initiated either through a federal nexus (i.e., Section 7 consultation, usually through the USACE or the Bureau of Land Management) or through the HCP process (i.e., Section 10 consultation). *California Tiger Salamander* *IV-7(a). Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if California tiger salamander is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.* *IV-7(b). Prior to initiation of ground-disturbing activities, a qualified biologist shall conduct a preconstruction survey of the seasonal wetlands in the eastern portion of the project site during the rainy season in order to determine whether they could be classified as breeding habitat for the California tiger salamander. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department. If breeding habitat is not*	

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		identified, further mitigation is not necessary. If the seasonal wetland is determined to be breeding habitat and cannot be avoided, the project applicant shall compensate for the loss of upland habitat at a minimum of a 2:1 impacts to replacement ratio. Mitigation land shall be permanently protected land within the Central California Distinct Population Segment (DPS) range of the California tiger salamander within 1.3 miles of a known breeding site, or as otherwise approved by CDFW and USFWS. Protection shall be accomplished through the purchase of the mitigation land in fee title or via recordation of a conservation easement over the mitigation land. In lieu of this mitigation prior to construction, the project applicant may purchase California tiger salamander credits at a 1:1 ratio from an approved mitigation bank. *In addition, if breeding habitat is planned to be removed, the applicant shall comply with the provisions of the federal Endangered Species Act and shall obtain take authorization from the USFWS for project-related losses of the California tiger salamander habitat, as required by law. To obtain a take permit, consultation with the USFWS would need to be initiated either through a federal nexus (Section 7 consultation, usually through the U.S. Army Corps of Engineers (USACE) or the Bureau of Land Management. Proof of compliance shall be*	

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Summary of Impacts and Mitigation Measures

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		submitted to the City of Antioch Community Development Department. *As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:* *1. Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or* *2. Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.* *California Red-Legged Frog* *IV-8(a). Prior to initiation of ground-disturbing activities on the project site and off-site improvement areas, the project applicant shall require all construction workers to attend tailgate training that includes a description of California red-legged frog and its habitat and measures to be implemented to protect the frog and minimize take if the frog is observed on*	

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		or near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion. *IV-8(b). A qualified biologist shall conduct preconstruction surveys for California red-legged frog prior to the initiation of ground-disturbing activities. If California red-legged frog are not encountered during the preconstruction surveys, further mitigation is not required. If California red-legged frog are present, they shall be relocated by the qualified biologist. The work areas shall be cleared and isolated with suitable wildlife exclusion fencing that would block the movement of California red-legged frogs from entering the work areas. A qualified biologist shall be on-site during particular times of construction to ensure California red-legged frog are not harmed, injured, or killed during project buildout.* *Upland habitats shall be managed via a long-term management plan to maintain the quality of the habitat for the movement and dispersal of California red-legged frog. Potential opportunities include, but are not limited to, enhancement of the channels and riparian corridor (e.g., formation of plunge pools), which would maximize opportunities to disperse from the ponds to even higher-quality habitat off-site.*	

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		In addition, if breeding habitat is planned to be removed, the applicant shall comply with the provisions of the federal Endangered Species Act and shall obtain take authorization from the USFWS for project-related losses, as required by law. To obtain a take permit, consultation with the USFWS would need to be initiated either through a federal nexus (Section 7 consultation, usually through the U.S. Army Corps of Engineers (USACE) or the Bureau of Land Management). Proof of compliance shall be submitted to the City of Antioch Community Development Department. *As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:* *1. Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or* *2. Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.*	

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Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Western Pond Turtle *IV-9(a). Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if western pond turtle is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.* *IV-9(b). Implement Mitigation Measures IV-8(b). If western pond turtle are observed on-site, they shall be allowed to leave the site on their own or be located by a CDFW-approved biologist. If a western pond turtle nest is observed, a 50-foot construction-free buffer around the nest site shall be established and maintained until a qualified biologist determines the nest is no longer active.* *American Badgers* *IV-10(a). Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and*	

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		instructions of what to do if an American badger is observed on or near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion. *IV-10(b). The project applicant shall retain a qualified biologist to conduct a preconstruction survey to determine the presence or absence of badgers prior to initiation of ground-disturbing activities. If badgers are not identified, further mitigation is not required. If an active badger den is identified during preconstruction surveys within or immediately adjacent to an area subject to construction, a qualified biologist shall establish a construction-free buffer of up to 300 feet around the badger den. Once the biologist has determined that the badger has vacated the burrow, the burrow can be collapsed or excavated, and ground disturbance can proceed. Should the burrow be determined to be a natal or reproductive den, and because badgers are known to use multiple burrows in a breeding burrow complex, a biological monitor shall be present on-site during construction activities in the vicinity of the burrows to ensure that the buffer is adequate to avoid direct impact to individuals or natal/reproductive den abandonment. The monitor shall be required to be present until it is determined that the badger young are of an independent age and*	

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		construction activities would not harm individual badgers. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department. San Joaquin Kit Fox *IV-11(a). Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if a kit fox is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.* *IV-11(b). A qualified biologist shall conduct preconstruction surveys no more than 14 days prior to site grading to determine the presence or absence of kit fox. If kit fox is not identified during the surveys, further mitigation is not required. If an active kit fox den is identified during preconstruction surveys within or immediately adjacent to an area subject to construction, a qualified biologist shall establish a construction free buffer of up to 300 feet around the San Joaquin kit fox den. Once the biologist has determined that the*	

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		San Joaquin kit fox has vacated the den, the den can be collapsed or excavated, and ground disturbance can proceed. Should the den be determined to be a natal or reproductive den, a biological monitor shall be present on-site during construction activities in the vicinity of the dens to ensure that the buffer is adequate to avoid direct impact to individuals or natal/reproductive den abandonment. The monitor shall be required to be present until it is determined that the young are of an independent age and construction activities would not harm individual San Joaquin kit fox. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department.	
IV-b. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service? IV-c. Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool,	S	*IV-12(a). Prior to the initiation of ground-disturbing activities, the project applicant shall submit a formal wetland delineation to the USACE for verification to determine the extent of all hydrological features, their jurisdictional status, and the extent of any impacts of the currently proposed project. A summary of the wetland delineation shall be submitted to the City of Antioch Community Development Department.* *IV-12(b). Prior to discharging any dredged or fill materials into any waters of the U.S. within the project site and/or the off-site improvement areas, the applicant shall obtain permit authorization to fill wetlands under Section 404 of the federal Clean Water Act (CWA)*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		*(Section 404 Permit) from USACE. The Section 404 Permit application shall include an assessment of directly impacted, avoided, and preserved acreages to waters of the U.S. Mitigation measures shall be developed as part of the Section 404 Permit to ensure no net loss of wetland function and values. Mitigation for direct impacts to waters of the U.S. within the project site and/or the off-site improvement areas would occur at a minimum of 1:1 ratio for direct impacts by purchasing seasonal wetland credits from the Cosumnes Mitigation Bank or other wetland mitigation bank that services the project site, as approved by the USACE and the RWQCB.* *Alternatively, the project applicant may create, preserve, and manage new seasonal wetlands on or off of the project site that is of equal or greater quality to the habitats being impacted at a minimum 1:1 mitigation ratio. A project-specific Wetland Mitigation and Monitoring Plan prepared by a qualified wetland restoration ecologist that includes the following information shall be provided to the City of Antioch Community Development Department prior to conducting any activity that would result in the placement of any fill material into a water of the U.S. or water of the State:* • *A description of the impacted water;*	

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		• *A map depicting the location of the mitigation site(s) and a description of existing site conditions;* • *A detailed description of the mitigation design that includes: (i) the location of the new seasonal wetlands; (ii) proposed construction schedule; (iii) a planting/vegetation plan; (iv) specific monitoring metrics, and objective performance and success criteria, such as delineation of created area as jurisdictional waters using USACE published methods; and (v) contingency measures if the created wetlands do not achieve the specified success criteria; and* • *Short-term and long-term management and monitoring methods.* *If the wetland mitigation site is a separate mitigation property, the project applicant will grant a conservation easement to a qualified entity, as defined by Section 81.5.3 of the California Civil Code, preserving the created seasonal wetland(s) in perpetuity, and establish an endowment fund to provide for the long-term management, maintenance, and monitoring of the created seasonal wetland(s). If the proposed project includes placing fill material into jurisdictional waters of the U.S. or waters of the State, the project applicant shall provide the City of Antioch Community Development*	

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Department with a copy of permits issued by the USACE and RWQCB authorizing the fill. *In addition, a Water Quality Certification or waiver pursuant to Section 401 of the CWA must be obtained for Section 404 permit actions. Proof of compliance with the mitigation measure shall be submitted to the City of Antioch Community Development Department prior to the issuance of grading permits.* *IV-12(c). Impacts to riparian habitat within CDFW's Section 1602 jurisdictional areas that would occur during construction shall be mitigated through planting California native trees and/or shrubs within the Sand Creek buffer area. Impacted trees and shrubs shall be mitigated with a 3:1 (replacement:impacts) ratio. Replacement trees and shrubs shall be a minimum of one gallon size trees/shrub replacements.* *In addition, the project applicant will implement appropriate BMPs to prevent construction related impacts that could introduce de minimus fill or other pollutants into Sand Creek and the creek's tributaries. The measures shall include the installation of wildlife-friendly hay wattles and/or silt fence that will prevent unintended de minimus fill impacts during construction activities associated with Sand Creek. In addition, orange silt fencing shall be installed at the top-of-bank of Sand Creek to*	

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact		Level of Significance Prior to Mitigation	Mitigation Measures		Level of Significance After Mitigation
				prevent unintended human and equipment traffic adjacent to Sand Creek. Finally, the dripline of all protected trees within the drainages on the project site, if near work areas, shall be protected through the installation of orange construction fencing. *The project applicant shall satisfy this mitigation by providing the City of Antioch Community Development Department with a fully executed copy of a Streambed Alteration Agreement (SBAA) with the CDFW that includes these, or other functionally equivalent, BMPs, prior to any construction activities associated with Sand Creek. The project applicant shall implement the conditions of the executed SBAA.*	
IV-e.	Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	S	*IV-13.*	*Prior to issuance of certificates of occupancy, all trees that are legally removed as part of the proposed project shall be replaced according to the following schedule, to the satisfaction of the City of Antioch Community Development Department:* *1. Each established tree: two 24-inch box trees.* *2. Each mature tree: two 48-inch box trees.* *The locations and sizes of the replacement trees shall be clearly shown on the final landscape plans, subject to review and approval by the City of Antioch Community Development Department.*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
V-a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5? V-b. Would the project Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5? V-c. Would the project disturb any human remains, including those interred outside of dedicated cemeteries.	S	*V-1. In the event that a cultural resource is inadvertently discovered during project activities, work shall be halted within 100 feet (30 meters) of the find and a qualified archaeologist (36 CFR Part 61) notified immediately so that an assessment of potential significance can be undertaken in accordance with City of Antioch General Plan Policy 10.9.2.d (2003). Construction activities may continue in other areas, but shall not resume in the area of the find until the City of Antioch Community Development Department provides written permission.* *If the discovery proves to be significant, additional work, such as data recovery excavation, may be warranted and would be discussed in consultation with the City of Antioch Community Development Department, any invested tribes, and other relevant regulatory agencies, as appropriate.* *V-2. In the event of the accidental discovery or recognition of any or human remains, further excavation or disturbance of the find or any nearby area reasonably suspected to overlie adjacent human remains shall not occur until compliance with the provisions of CEQA Guidelines Section 15064.5(e)(1) and (2) has occurred. The Guidelines specify that in the event of the discovery of human remains other than in a dedicated cemetery, no further excavation at the site or any nearby area suspected to contain human remains shall occur*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		until the County Coroner has been notified to determine if an investigation into the cause of death is required. If the coroner determines that the remains are Native American, then, within 24 hours, the Coroner must notify the Native American Heritage Commission, which in turn will notify the most likely descendants who may recommend treatment of the remains and any grave goods. If the Native American Heritage Commission is unable to identify a most likely descendant or most likely descendant fails to make a recommendation within 48 hours after notification by the Native American Heritage Commission, or the landowner or his authorized agent rejects the recommendation by the most likely descendant and mediation by the Native American Heritage Commission fails to provide a measure acceptable to the landowner, then the landowner or his authorized representative shall rebury the human remains and grave goods with appropriate dignity at a location on the property not subject to further disturbances. Should human remains be encountered, a copy of the resulting County Coroner report noting any written consultation with the Native American Heritage Commission shall be submitted as proof of compliance to the City's Community Development Department.	

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
VII-a. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: iii. Seismic-related ground failure, including liquefaction? iv. Landslides? VII-c. Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? VII-d. Would the project be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	S	*VII-1. All grading and foundation plans for the development shall be designed by a Civil and Structural Engineer and reviewed and approved by the City of Antioch Building Division prior to issuance of grading and building permits to ensure that all geotechnical recommendations specified in the Preliminary Geotechnical Exploration prepared for the proposed project are properly incorporated and utilized in the project design.* *VII-2. Prior to issuance of any grading permits, the project applicant shall submit to the City of Antioch Engineering Department, for review and approval, a design-level geotechnical exploration study produced by a California Registered Civil Engineer or Geotechnical Engineer and identify grading and building practices necessary to achieve compliance with the latest adopted edition of the California Building Standards Code's geologic, soils, and seismic requirements. Consistent with the Preliminary Geotechnical Exploration prepared for the proposed project, the design-level geotechnical exploration study shall include additional soil borings, test pits, laboratory testing, chemical testing for corrosivity, geologic mapping and fault trenching/evaluation.*	LS
IV-b. Would the project result in substantial soil erosion or the loss of topsoil?	S	*VII-3. Prior to issuance of grading and building permits, the project applicant shall submit, for the review and approval by the City Engineer, an erosion control*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures		Level of Significance After Mitigation
			plan that utilizes standard construction practices to limit the erosion effects during construction of the proposed project. Measures shall include, but are not limited to, the following: • *Hydro-seeding;* • *Placement of erosion control measures within drainage ways and ahead of drop inlets;* • *The temporary lining (during construction activities) of drop inlets with "filter fabric" (a specific type of geotextile fabric);* • *The placement of straw wattles along slope contours;* • *Directing subcontractors to a single designation "wash-out" location (as opposed to allowing them to wash-out in any location they desire);* • *The use of siltation fences; and* • *The use of sediment basins and dust palliatives.*	
IV-f. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	S	*VII-4.*	*Prior to the initiation of ground-disturbing activities, a qualified paleontologist shall be retained to administer Worker Environmental Awareness Program (WEAP) training to construction personnel so that a basic understanding of local geology and the paleontological sensitivity of the project area will be acquired by those involved in earth-moving activities. The training shall include information on the types of fossils that may be encountered during*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		project work, relevant compliance requirements, and the course to action to be taken in the event of an inadvertent fossil discovery. A sign-in sheet shall be kept with the signatures of all attendees for submission to the City of Antioch Community Development Department. *VII-5. In the event that a paleontological resource is inadvertently discovered during project-related work, regardless of the depth of excavation or location, work shall be halted within 50 feet (15 meters) of the find and a qualified paleontologist (Society of Vertebrate Paleontology [SVP] 2010) notified immediately so that an assessment of the resource's potential significance can be undertaken in accordance with City of Antioch General Plan Policy 10.9.2.d (City 2003). Construction activities could continue in other areas.* *If the find is determined to be significant under SVP criteria, the find shall be left in place without further disturbance, or if avoidance is not feasible, then additional work, such as fossil recovery excavation (salvage) and curation at a certified repository, such as the University of California Museum of Paleontology (UCMP), may be warranted and would be discussed in consultation with the City of Antioch Community Development Department, and any other relevant regulatory agency, as appropriate.*	

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
IX-b. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?	S	*IX-1. Prior to final map approval, the project applicant shall submit to the City of Antioch Engineering Department, for review and approval, plans which show that future inhabited structures will not be located over or within the required setback from any active petroleum pipelines in compliance with the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) Construction Site Review Program.* *IX-2. Prior to issuance of any grading permits, the project applicant shall coordinate with Conoco Phillips and Chevron to determine the accurate depths and alignment of the existing on-site pipelines and shall conduct field checking and potholing of the pipelines, if necessary. Arrangements for potholing of the pipelines shall be made at least 48 hours in advance. The project applicant shall be responsible for providing a backhoe and operator, as well as a surveyor if needed. All construction plans that involve pipeline easement encroachments shall be submitted to the applicable pipeline owner to allow for review.* *After determining the accurate depths and alignments of the existing pipelines, the results shall be noted on all project construction plans, subject to review by the City Engineer. For any work occurring within the pipeline easement, construction plans shall demonstrate compliance with applicable local,*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures		Level of Significance After Mitigation
			State, and federal regulations and development restrictions, which would include, but would not be limited to, the following: • *Maintain a minimum of 12 inches of clearance between the pipelines and other cross-lines that intersect at a 90-degree angle, or a minimum of 24 inches of clearance for intersection angles less than 90-degrees;* • *Maintain a minimum of 24 inches of undisturbed clearance between the top of pipe and bottom of the sub grade for paving and grass or shallow rooted plants within the pipeline easements;* • *Prohibit deep-rooted trees and structures within pipeline easements;* • *All excavations within 24-inches of the pipelines shall be accomplished using hand tools only;* • *Restrict use of heavy vibratory equipment over pipelines; and* • *Notify Underground Service Alert (USA) at 800-227-2600 at least 48 hours prior to any excavation work.*	
X-a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	S	*X-1.*	*Prior to issuance of grading permits, the contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP). The developer shall file the Notice of Intent (NOI) and associated fee to the SWRCB. The SWPPP shall serve as the framework for*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		identification, assignment, and implementation of BMPs. The contractor shall implement BMPs to reduce pollutants in stormwater discharges to the maximum extent practicable. The SWPPP shall be submitted to the Director of Public Works/City Engineer for review and approval and shall remain on the project site during all phases of construction. Following implementation of the SWPPP, the contractor shall subsequently demonstrate the SWPPP's effectiveness and provide for necessary and appropriate revisions, modifications, and improvements to reduce pollutants in stormwater discharges to the maximum extent practicable.	
X-c. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: iv. Impede or redirect flood flows?	S	*X-2. Prior to issuance of grading permits, the project applicant shall prepare a site-specific hydraulic analysis to determine the BFE within Zone A in the vicinity of the proposed EVA. If the analysis determines that the portion of the proposed EVA within the floodplain would be less than one foot above the BFE, the elevation of the portion of the EVA within the floodplain shall be raised to at least one foot above the BFE or to the satisfaction of the CCCFCD. The site-specific hydraulic analysis and proof of CCCFCD satisfaction shall be submitted to the City of Antioch Community Development Department.*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
XIII-a. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	S	*XII-1. Prior to approval of grading permits, the City shall establish the following requirements, via written notation on final improvement plans, subject to review and approval by the City of Antioch Community Development Department:* • *Construction activities shall be limited to the hours of 8:00 AM and 5:00 PM Monday through Friday when work is within 300 feet of occupied dwellings, and to between the hours of 7:00 AM and 7:00 PM Monday through Friday when work occurs greater than 300 feet from occupied dwellings. Such activities should be limited to the hours of 9:00 AM and 5:00 PM on Saturdays. No construction shall be allowed on Sundays and public holidays.* • *The construction contractor shall use temporary noise attenuation fences to protect sensitive receptors west of the project site.* • *The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.* • *Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		• *When not in use, motorized construction equipment shall not be left idling for more than five minutes.* • *Stationary equipment (power generators, compressors, etc.) shall be located at the furthest practical distance from nearby noise-sensitive land uses or sufficiently shielded to reduce noise-related impacts.*	
XVIII-a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is: listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	S	*XVIII-1. Implement Mitigation Measures V-1 and V-2.*	LS

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
XVIII-b. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?			

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Table 2-1
Summary of Impacts and Mitigation Measures

Impact		Level of Significance Prior to Mitigation	Mitigation Measures		Level of Significance After Mitigation
XXI-a.	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	S	*XXI-1.*	*Implement Mitigation Measures IV-1 through IV-13, V-1, and V-2.*	LS

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3. Project Description

3. PROJECT DESCRIPTION

3.1 INTRODUCTION

Section 15125 of CEQA Guidelines requires an EIR to include a description of the physical environmental conditions of the project site and the site vicinity, as they exist at the time the Notice of Preparation is published, from a local and regional perspective. Knowledge of the existing environmental setting is critical to the assessment of environmental impacts. Per CEQA Guidelines Section 15125, the description of the environmental setting shall not be longer than necessary to understand the potential significant effects of the project. Please note that detailed discussions of the existing setting in compliance with CEQA Guidelines Section 15125, specific to each environmental resource area, are included in each corresponding technical chapter of this EIR.

The Project Description chapter of the EIR provides a comprehensive description of the Albers Ranch Project (proposed project) in accordance with CEQA Guidelines Section 15124. A detailed description of the project location, project setting and surrounding land uses, project objectives, project components, and required project approvals is presented below.

3.2 PROJECT LOCATION

The project site consists of approximately 96.5 acres located east of the Deer Valley Road/Deer Hill Lane intersection in the City of Antioch, California. The City of Antioch is within eastern Contra Costa County and is bordered to the north by the San Joaquin River Delta; to the east by the City of Brentwood and the City of Oakley; to the west by the City of Pittsburg and unincorporated portions of Contra Costa County; and to the south by unincorporated portions of Contra Costa County (see Figure 3-1). The site is identified by Assessor's Parcel Numbers (APNs) 057-042-006 and 057-050-021.

The project site is bordered by the City of Antioch/Contra Costa County line to the south. The City of Antioch/City of Brentwood limit is further east of the site (see Figure 3-2). Sand Creek is located along the northern border of the site, and State Route (SR) 4 is located approximately 1.44 miles east of the site.

3.3 PROJECT SETTING AND SURROUNDING LAND USES

The following sections describe the existing setting of the project site and the surrounding land uses in the project vicinity.

Project Site Setting

The project site is situated within the Sand Creek Focus Area of the General Plan, which contains lands designated by the Antioch General Plan for open space, residential, commercial, and mixed-use development. Per the City's General Plan, the majority of the site is designated Hillside, Estate and Executive Residential/Open Space, while the western portion of the site, alongside Deer Valley Road, is designated Commercial/Open Space. The site is zoned Study District.

Figure 3-1
Regional Project Location

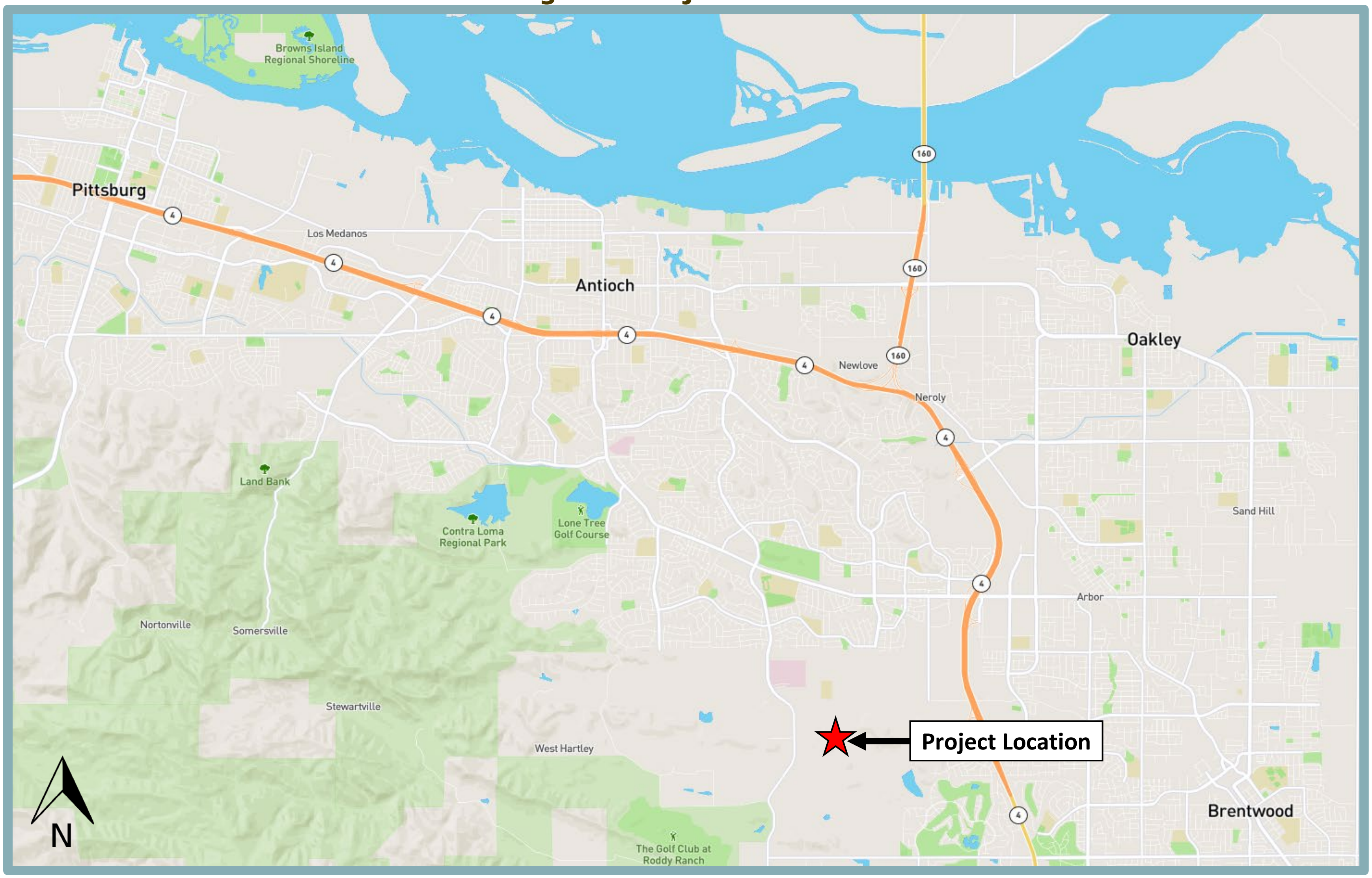
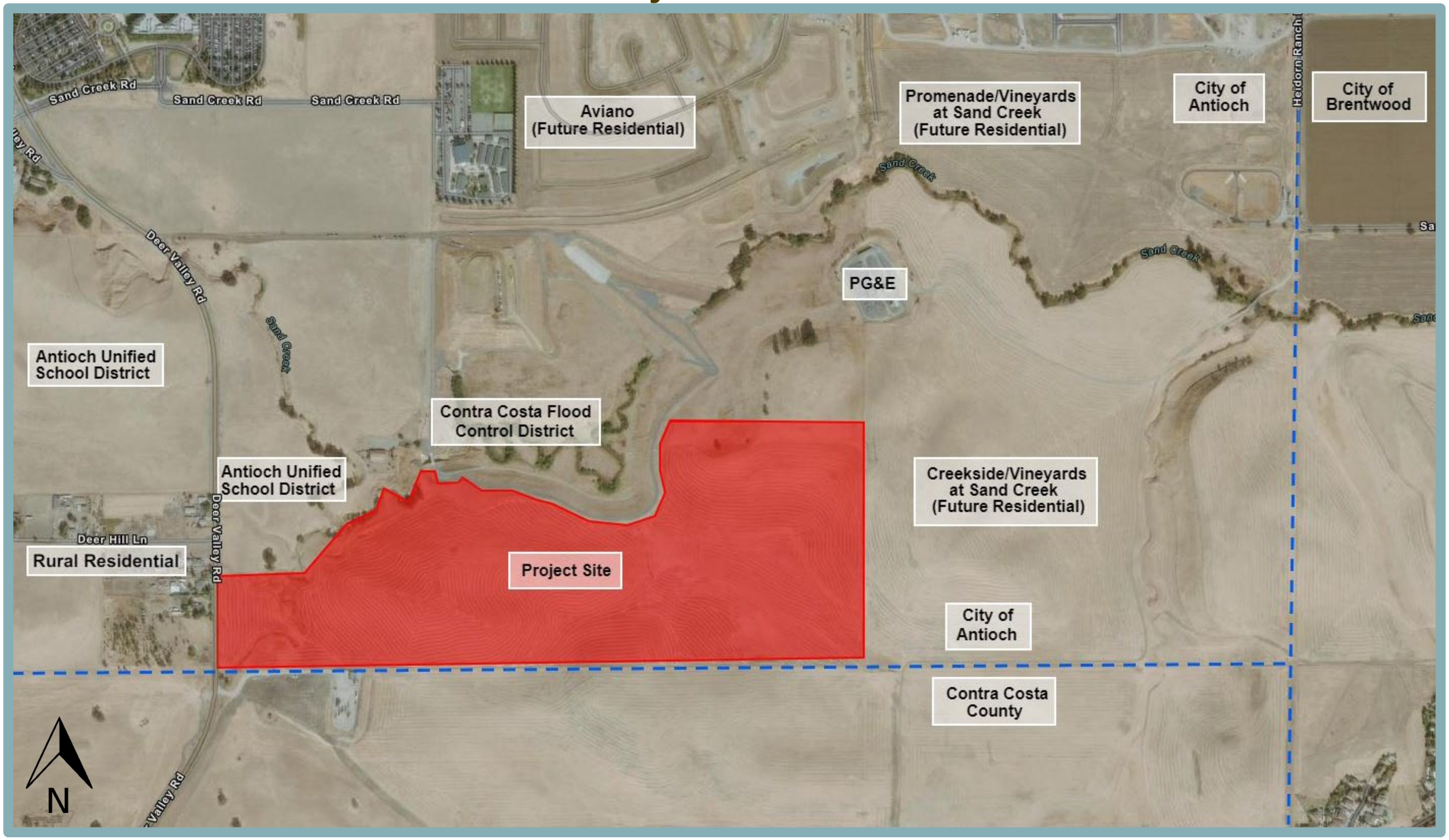


Figure 3-2
Project Location



The project site is generally rectangular, with the southern, western, and eastern boundaries linear, and the northern property line meandering in and out as it follows Sand Creek towards the respective property corners as shown in Figure 3-2. Currently, the project site is undeveloped, consisting primarily of non-native vegetation. A reach of Sand Creek, a tributary to Marsh Creek, extends through the western portion of the project site.

The topography of the site is defined by two large knolls within the western and northeastern portions of the site. Elevations on the project site range from approximately 324 feet above mean sea level (msl) at the top of the western knoll, to 175 feet at the southeastern corner of the site. It should be noted that currently, 16.5-foot-wide and 10-foot-wide utility easements are located parallel to each other along the site's western boundary. In addition, a second pair of utility easements extends from Deer Valley Road diagonally toward the southern site boundary.

As shown in Figure 3-2, the majority of the surrounding area has been approved for residential development. Within the City of Antioch, the area to the north of the site is approved for development with the Aviano Project, the area to the northeast of the site is approved for development with the Promenade/Vineyards at Sand Creek Project, and the area to the east is approved for development for the Creekside/Vineyards at Sand Creek Project.

Surrounding Land Uses

Surrounding existing uses include rural single-family residential located west of the site, across Deer Valley Road, and Contra Costa County Flood Control District (CCCFCD) infrastructure, Upper Sand Creek Basin (Basin), and vacant Antioch School District property to the north. The CCCFCD's Basin is owned in fee title by the CCCFCD and includes additional CCCFCD rights-of-way in the form of easements along the Basin's south and east side. An existing Pacific Gas and Electric Company (PG&E)-owned parcel with an electrical substation, designated Public/Quasi Public per the General Plan, is located northeast of the site. The area south of the site is undeveloped, consisting of dry farmland outside the City's Sphere of Influence and Planning Area, within unincorporated Contra Costa County.

3.4 PROJECT OBJECTIVES

The proposed project is intended and designed to be able to serve all single-family market segments in the City of Antioch. The project, thus, seeks the flexibility to be a true multi-generational market-rate residential community of up to 300 homes and related amenities where families may live the majority of their lives within the three primary components; traditional market rate homes, active adult senior, and assisted living seniors. The project applicant has developed the following objectives for the proposed project:

1. To create the only intentionally designed multi-generational community in the east Bay Area with active adult seniors that may age-in-place in the same neighborhood as traditional family homes.

2. To maximize the opportunity for development of housing and help the City of Antioch provide its fair share of housing, and help alleviate a regional housing shortage, by providing a mix of housing types and sizes, some moderately affordable, and that can meet the needs of a variety of different and growing household sizes.

3. To provide onsite amenities, such as parks space, a clubhouse, and recreational and social opportunities for residents.

4. To permanently protect nearly 50 percent of the project site as undeveloped open space.

5. To create public meeting places and pedestrian trails and exercise opportunities throughout the site with connections between new open space amenities including preserved areas of Sand Creek and planned City facilities, including the Sports Complex.

6. To implement the County's Growth Management Program by providing for urban development within the Urban Limit Line.

7. To contribute to the City of Antioch's economic and social viability by creating a community that attracts investment and positive attention by adding residents who tend to shop locally, maintain high volunteerism, and travel less frequently during peak traffic hours.

8. To provide for various infrastructure improvements that would benefit the community, including the extension of Hillcrest Avenue in conjunction with Subdivision 9501, public roadway improvements to serve the project, extension of utilities within those roadways, and drainage facilities to appropriately collect and convey storm water runoff to designated detention basins.

9. To create, preserve, and maintain open space and critical biological habitat on- and off-site so as to responsibly address the environmental sensitivity of the site.

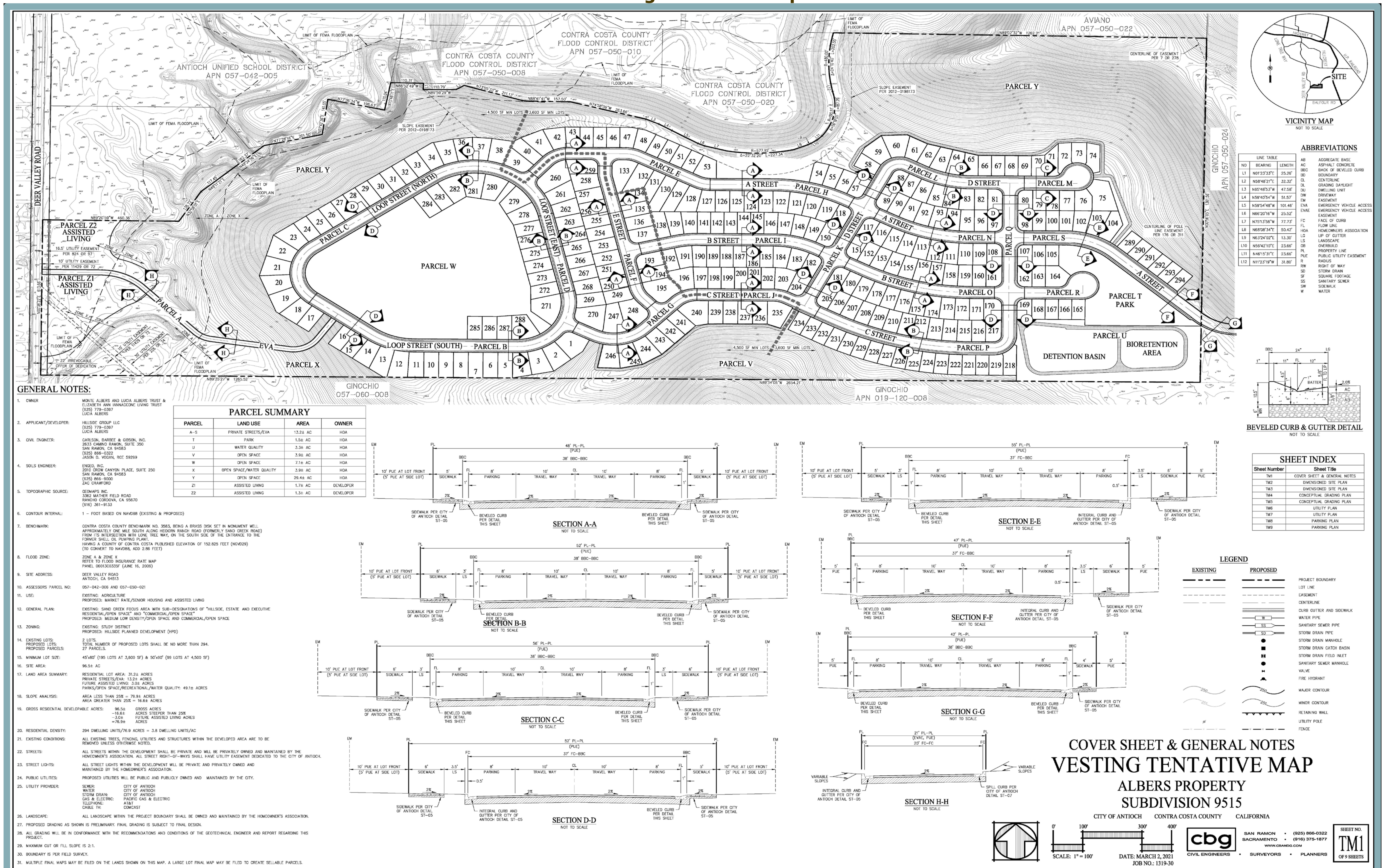
10. To create an economically viable project that provides a fair share contribution of infrastructure to the community through payment of fees, and/or land-based financing, and/or construction of required capital improvements, while providing a well-designed community of the type and style desired by current and future active adult citizens and families of Antioch and the greater Bay Area.

3.5 PROJECT COMPONENTS

The proposed project would include development of a single-family residential subdivision with 294 units, as well as recreational amenities and associated improvements (see Figure 3-3). The proposed project would also include future development of an assisted living facility and neighborhood commercial development upon issuance of a Conditional Use Permit (CUP). Development of the single-family residential subdivision, assisted living facility, and neighborhood commercial land uses, including proposed roadways, would total approximately 47.4 acres. The remaining 49.1 acres of the site would be retained as open space.

The project would require City approval of the following: General Plan Amendment, Master Development Plan/Rezone, Development Agreement, Vesting Tentative Map, and Resource Management Plan. The details of the proposed project, including required approvals, are described in further detail below.

Figure 3-3
Vesting Tentative Map



General Plan Amendment

The proposed project would include a General Plan Amendment to the land use map for the Sand Creek Focus Area of the General Plan to change the portion of the site currently designated Hillside, Estate and Executive Residential/Open Space to Medium Low Density Residential/Open Space. The western portion of the site; designated Commercial/Open Space, will retain the existing designations.

The proposed project would also include a General Plan Amendment to the text of the Sand Creek Focus Area of the General Plan in order to add a sub area to the Sand Creek Focus Area called the Albers Ranch Sub Area.

Master Development Plan/Rezone/Development Agreement

The proposed project would require approval of a rezone to change the zoning designation of the site from Study District to Hillside Planned Development (HPD), subject to a Master Development Plan. The Master Development Plan and HPD district would list the development standards applicable to the project site, including setbacks, lot sizes, and building heights for the single-family residential subdivision. The future assisted living facility and neighborhood commercial land uses would be required to comply with the Zoning Ordinance. In addition, the applicant is requesting City approval of a Development Agreement, which would assure the City that the proposed project would proceed to its completion in compliance with the plans submitted by the applicant, and assure the applicant of vested rights to develop the project.

Vesting Tentative Map

The proposed project would include a Vesting Tentative Map (see Figure 3-3) to subdivide the project site into 294 single-family lots. Of the 96.5-acre site, only 79.9 acres are considered developable due to site constraints (e.g., slopes greater than 25 percent), three acres of which are proposed for future development of an assisted living facility and neighborhood commercial land uses. Approximately 31.2 acres are proposed for development of single-family residential lots, 13.2 acres would be developed with private streets, and 49.1 acres would be used for parks, open space, recreation, and water quality/detention purposes. Table 3-1 provides a summary of the proposed land uses.

Table 3-1
Proposed Land Uses

Proposed Land Use	Parcels	Acreage
Single-Family Residential	-	31.2
Private Streets/EVA	A-S	13.2
Parks/Open Space/Recreational/Water Quality	T, V, W, X, Y, U	49.1
Future Assisted Living Facility and Neighborhood Commercial	Z1, Z2	3.0
Total	**--**	**96.5**

The areas to remain open space would include the hillside within the northeastern portion of the site, the hillside along the center of the southern site boundary, the upper reaches of the existing knoll within the western portion of the site, and a setback between the future development parcels and the proposed homes.

Single-Family Residential

The proposed single-family residential uses would represent a continuation of other planned development in the project vicinity. The average density of the proposed residential development would be approximately 3.8 dwelling units per acre (294 units/76.9 acres of developable land). Six different models, each with three different elevations, would be constructed. Residential lot sizes would generally transition from larger sizes within the eastern portion of the site, closer to the Creekside/Vineyards at Sand Creek Project, to slightly smaller sizes within the western portion of the site ranging from a minimum of 3,600 square feet (sf) to a maximum of 9,000 sf.

Access and Circulation

The area to the east of the site is planned for future development with the Creekside/Vineyards at Sand Creek Project, which would include extension of a new roadway, Hillcrest Avenue, to the eastern site boundary. Primary access to the proposed project would be provided by a new on-site roadway connecting to the planned Hillcrest Avenue extension east of the site. The connection to Hillcrest Avenue is contingent upon construction of the Creekside/Vineyards at Sand Creek Project. In the event that the Creekside/Vineyards at Sand Creek Project is not constructed, access to the proposed project may be provided by an alternate roadway connecting the northern portion of the project site to the future Sand Creek Road included as an Irrevocable Offer of Dedication (IOD) as part of the Aviano Project. If the developer desires the optional roadway for development, the developer would need to acquire a portion of the right-of-way from the CCCFCD in order to construct the optional road. The sale of right-of-way is at the CCCFCD discretion. An emergency vehicle access (EVA) only roadway would provide secondary access from Deer Valley Road to the western portion of the project site. The EVA would follow the existing alignment of the unimproved private access road over a culvert. Within the project site, all proposed internal streets would be private and would be consistent with applicable City of Antioch design standards. Parking would be allowed on both sides of the internal roadways, providing for a total of 362 spaces. In addition, two covered garage parking spaces would be provided within each residential unit, providing a total of 588 spaces.

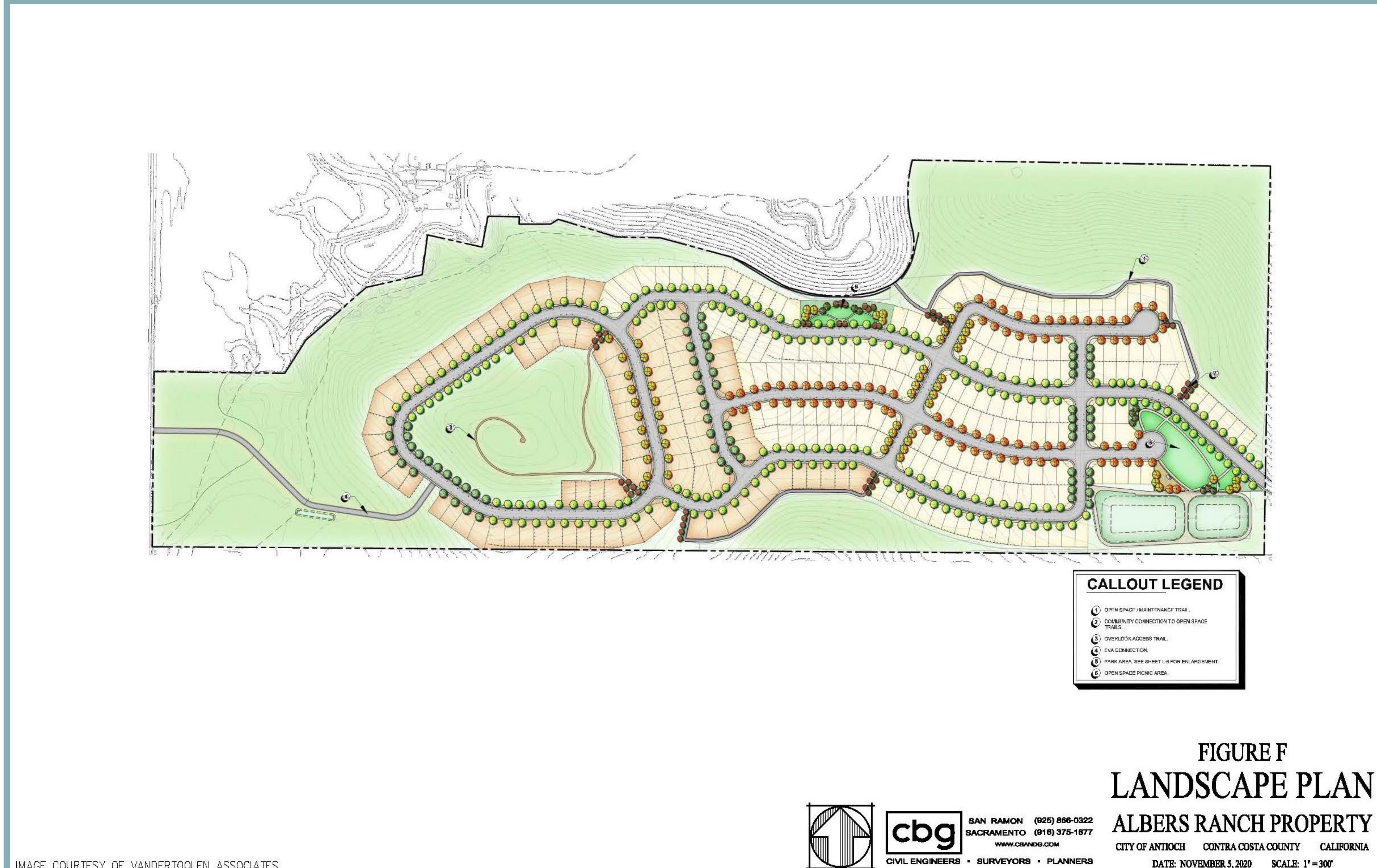
Parks, Trails, Open Space, and Landscaping

As part of the proposed project, a total of 41.9 acres would be reserved for private parks and recreational facilities and retained as open space (see Figure 3-4).

Parcel T, located in the southeastern portion of the project site, would include a 1.5-acre park to provide recreational amenities for the project site. Parcel X, located south of the EVA, would be retained as open space, with a portion of the parcel to be used for water quality/bioretention purposes. Parcels V, W, and Y would be preserved as open space and would include trails accessible to future residents. Parcel V would be located on the southern border of the project site and would include an open space/maintenance trail. Parcel W is located on the western knoll of the project site surrounded by proposed residential lots and would include an overlook access trail. Parcel Y would be located along the northern portion of the project site and would also include an open space/maintenance trail.

The proposed project would include community trails between lots throughout the project site to provide access to the designated open space/trails in Parcels V, W, and Y. Two community trails, located north of Parcel V, would provide residential access to the designated open space/maintenance trail in Parcel V. Additionally, two community trails, east of Parcel W, would provide residential access to the overlook access trail in Parcel W.

Figure 3-4
Landscaping Plan



Three community trails, located in the northeast portion of the project site, would provide residential access to the designated open space/maintenance trail in Parcel Y. The designated open space/maintenance trail in Parcel Y would provide community access to Sand Creek. The proposed project would also include an open space picnic area between lots 53 and 54 south of Sand Creek.

Landscaping features would be provided throughout the proposed development area and would conform to the requirements and provisions of Section 9-5.1001 of the City of Antioch Municipal Code. Individual residences would also be landscaped with trees, shrubs, groundcover and some lawns, and would be maintained by the individual owners. Public spaces, open spaces, and private landscaping areas would have an emphasis on drought-tolerant and adaptive plant species.

Utilities

Figure 3-5 illustrates the proposed water, sewer, and stormwater utility improvements associated with the project.

Water supply for the proposed development would be provided by the City. Potable water would be distributed to the project site by an existing 12-inch Zone III trunk line in the future Hillcrest Avenue. The water line would continue south to I Street planned by the Creekside/Vineyards at Sand Creek Project, then head west to the proposed project boundary.

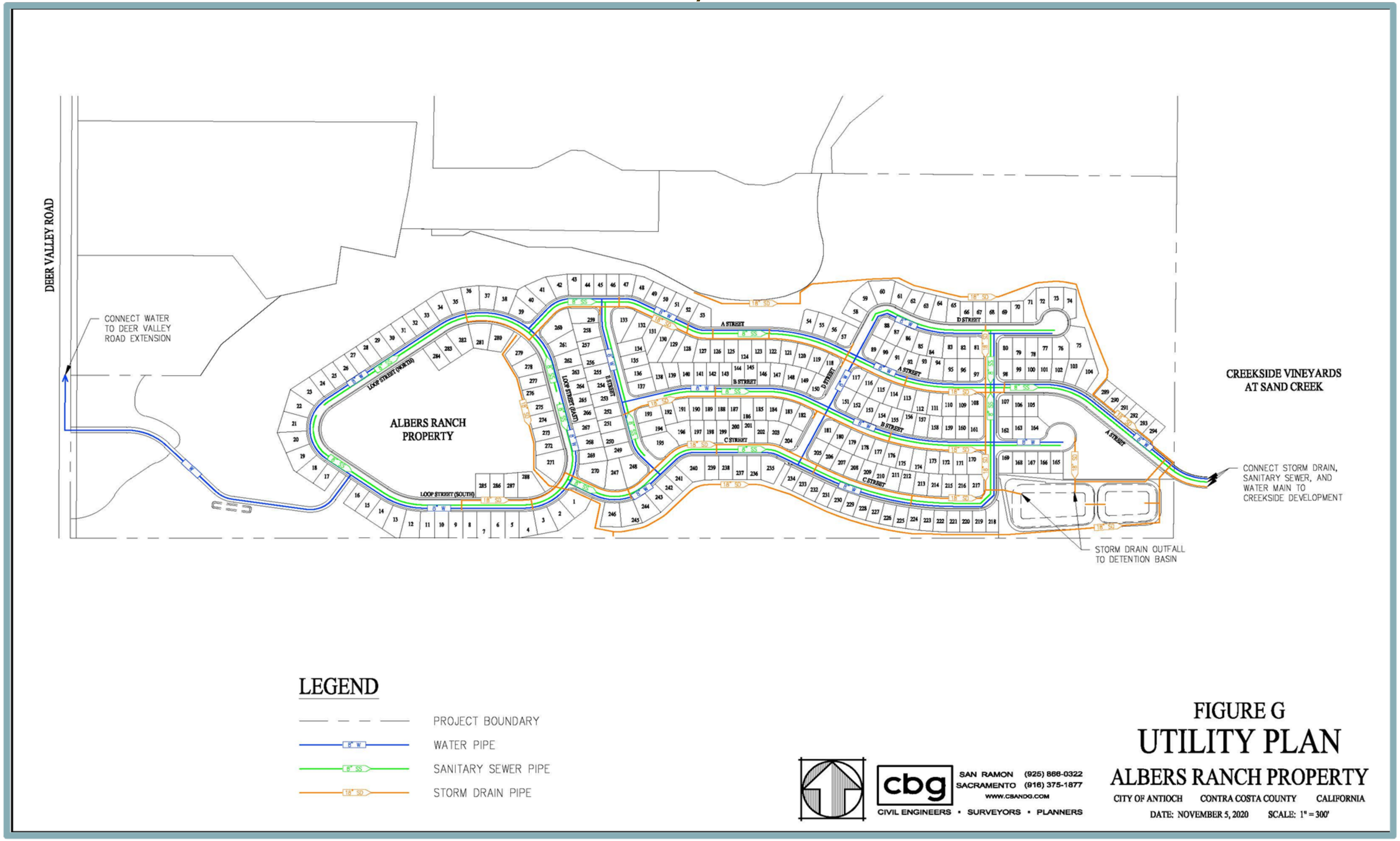
The internal private streets within the proposed project would include water lines that would connect to the water line from the Creekside/Vineyards at Sand Creek Project. In addition, a water line would be undergrounded below the proposed EVA road in the western portion of the site, and follow Deer Valley Road north to connect to the City's existing water system (see Figure 3-5).

Wastewater conveyance for the proposed development would be provided by the City. The proposed project would include construction of sanitary sewer lines beneath the proposed private streets that would connect to I Street in the Creekside/Vineyards at Sand Creek Project. The Creekside/Vineyards at Sand Creek Project includes a main sewer line that would eventually connect to a planned sewer line in Sand Creek Road.

The project site naturally drains to the east. The proposed project would include construction of a series of drain inlets and underground storm drain pipes to capture stormwater runoff from impervious surfaces created by the project. Runoff would be routed to a detention basin and bio-retention basin located within the southeastern portion of the project site (Parcel U). The basin would provide for treatment and detention of captured stormwater runoff.

The stormwater flows would be metered from the basin to match pre-development rates. A discharge line would be constructed into I Street of the Creekside/Vineyards at Sand Creek Project. The proposed EVA road in the western portion of the site would generate a relatively small amount of runoff. The runoff from the EVA road would be collected into a proposed bio-swale within Parcel X and eventually discharge through a new outfall into Sand Creek. Detention of the runoff from the EVA would not be necessary as Sand Creek drains into the Basin.

Figure 3-5
Utility Plan



Electricity for the proposed project would be provided by PG&E. Telecommunication services would be provided by AT&T. Comcast and Astound would provide cable television and internet services to the project site. Dry utilities, electrical, gas, and technology lines would be extended from Sand Creek Road beneath future Hillcrest Avenue to the project site.

The proposed project would not conflict with the existing utility easements located along the site's western boundary or southwestern portion of the site.

Off-Site Improvements

As noted above, should the Creekside/Vineyards at Sand Creek Project not be developed, an alternative roadway to the north may be constructed as part of the proposed project. Figure 3-6 below illustrates the proposed alternative roadway connection configuration. As shown in the figure, the alternative roadway would connect the northern portion of the site to the future Sand Creek Road, following the eastern boundary of the CCCFCD property and Basin and crossing Sand Creek. Any roadway and associated grading of the alternate roadway near the Basin's main dam and/or saddle dike would require Division of Safety of Dams (DSOD) discretionary approval. In addition, the project applicant would be required to obtain a CCCFCD encroachment permit for any work planned within the CCCFCD property. The optional roadway was included as part of the Aviano Project and has been analyzed within the associated EIR.

Project Construction

All project improvements, including off-site improvements, are anticipated to be built over two phases. While detailed phasing information is not available at this time, each phase would involve development of single-family homes arranged into several neighborhoods and each phase will require approval of a CUP.

Project grading would be balanced on-site with import/export minimized to the extent feasible. Final grading is dependent on utility configurations and geotechnical considerations. While portions of the open space areas would not be subject to ground disturbances as part of the project, limited grading would be required at the western knoll within the site, along the southeastern site boundary, and along the perimeter of the lots within the northeastern portion of the site. Overall, a total of 66 acres within the project site would be subject to grading as part of the proposed project. The limits of the proposed grading activity are shown in Figure 3-7 and Figure 3-8. As shown in the figures, five-foot-tall (maximum) and 15-foot-tall (maximum) retaining walls would be required along the perimeter of the proposed lots in certain locations to accommodate the sloping topography of the site.

Future Assisted Living and Neighborhood Commercial Development

The three acres retained for future assisted living and neighborhood commercial development would consist of two parcels totaling 1.7 and 1.3 acres, respectively, located along Deer Valley Road within the western portion of the project site. Upon issuance of a CUP, the future development is anticipated to include an approximately 150-bed assisted living facility and approximately 40,000 sf of neighborhood commercial land uses. While not anticipated for development as part of the proposed project, this EIR includes analysis of the future buildout of the parcels.

Figure 3-6
Off-site Improvement Areas

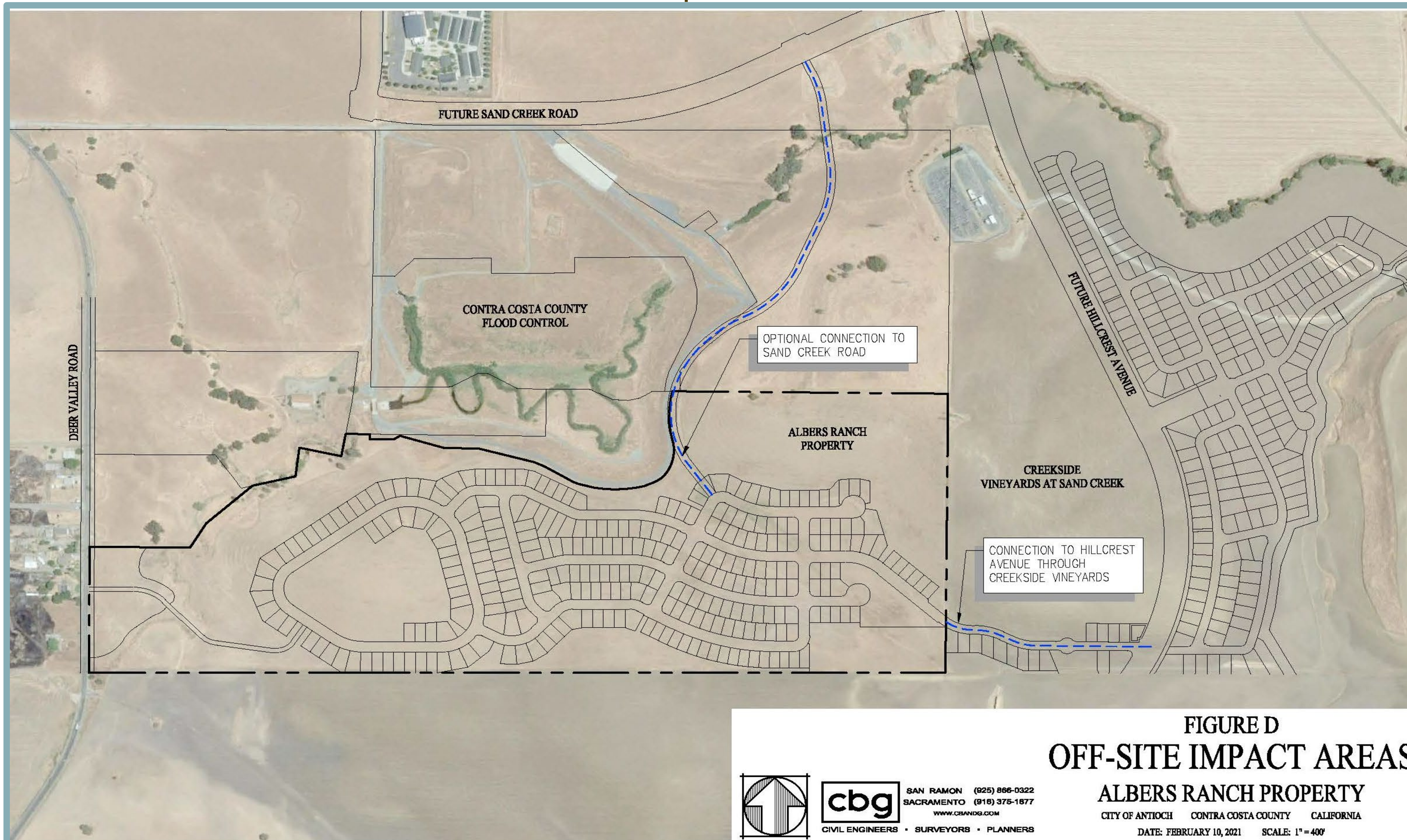


Figure 3-7
Conceptual Grading Plan (West)

Figure 3-8
Conceptual Grading Plan (East)

3.6 PROJECT APPROVALS

The proposed project would require City approval of the following:

- General Plan Amendment. The proposed project would require approval of a General Plan text and map amendment to the Sand Creek Focus Area of the General Plan to change the land use designations of the site from Hillside, Estate and Executive Residential/Open Space and Commercial/Open Space to Medium Low Density Residential/Open Space and Commercial/Open Space. A text amendment to the Sand Creek Focus Area of the General Plan would also be required to add the Albers Ranch Sub Area to the Sand Creek Focus Area.
- Master Development Plan/Rezone/Development Agreement. The proposed project would require a rezone from Study District to HPD. HPD would include development standards for the project. The Development Agreement would allow the City and the applicant to enter into an agreement to assure the City that the proposed project would be completed in compliance with the plans submitted by the applicant, and assure the applicant of vested rights to develop the project.
- Vesting Tentative Map. The proposed project would require approval of a Vesting Tentative Map for the subdivision of the project site into multiple parcels to accommodate 294 single-family residential units, a parcel for a potential future assisted living facility and neighborhood commercial land uses, and recreation, parks, and open space.
- Resource Management Plan. Pursuant to Section 4.4.6.7(t) of the City of Antioch General Plan, the applicant will prepare a Resource Management Plan for City approval.

In addition to approvals from the City of Antioch, the proposed project may require approvals/permits from the following State, federal, or local agencies:

- Bay Area Air Quality Management District (BAAQMD);
- California Department of Fish and Wildlife (CDFW);
- California DSOD;
- Central Valley Regional Water Quality Control Board (RWQCB);
- CCCFCD;
- U.S. Army Corps of Engineers (USACE); and
- U.S. Fish and Wildlife Service (USFWS).

4. Existing Environmental Setting, Impacts, and Mitigation

4.0 Introduction to the Analysis

4.0 INTRODUCTION TO THE ANALYSIS

4.0.1 INTRODUCTION

The technical chapters of the EIR analyze the potential impacts of buildout of the proposed project on Air Quality and Greenhouse Gas Emissions, and Transportation. Chapters 4.1 and 4.2 of the EIR include the following: the environmental setting as the setting relates to the specific issue; standards of significance; method of analysis; and project-specific impacts and mitigation measures. Additionally, Chapters 4.1 and 4.2 describe the cumulative impacts of the project combined with past, present and reasonably probable future projects for each issue area. The format of each of the technical chapters is described at the end of this chapter. It should be noted that all technical reports are either attached to this EIR or available at the City by request.

4.0.2 DETERMINATION OF SIGNIFICANCE

Under CEQA, a significant effect is defined as a substantial or potentially substantial adverse change in the environment (Public Resources Code Section 21068). The Guidelines implementing CEQA direct that the determination be based on scientific and factual data. The specific criteria for determining the significance of a particular impact are identified within the impact discussion in each chapter and are consistent with significance criteria set forth in the CEQA Guidelines.

4.0.3 ENVIRONMENTAL ISSUES DISMISSED IN THE INITIAL STUDY

The Initial Study prepared for the proposed project and circulated with the Notice of Preparation (NOP) (Appendix A to this EIR) includes a detailed environmental checklist addressing a range of technical environmental issues. For each technical environmental issue, the Initial Study identifies the level of impact for the proposed project. The Initial Study identifies the environmental effects as “no impact,” “less than significant,” “less than significant with mitigation incorporated,” and “potentially significant.”

Impacts identified in the Initial Study as less than significant or no impact are summarized below. All remaining issues identified in the Initial Study as potentially significant are discussed in the subsequent technical chapters of this EIR.

- *Aesthetics (All Sections):* The proposed project site is not located within the vicinity of a designated scenic vista. In addition, the project site is located approximately 14 miles northeast of the nearest designated State Scenic Highway, Interstate 680 (I-680). Therefore, the proposed project would not have a substantial adverse effect on a scenic vista and would not substantially damage scenic resources. In addition, the Initial Study concluded that impacts related to substantially degrading the visual character or quality of the site and introduction of new sources of light and glare would be less than significant. Overall, the proposed project would result in *less-than-significant* impacts related to aesthetics.

- *Agriculture and Forest Resources (All Sections):* The project site is identified by the California Department of Conservation Farmland Mapping and Monitoring Program as

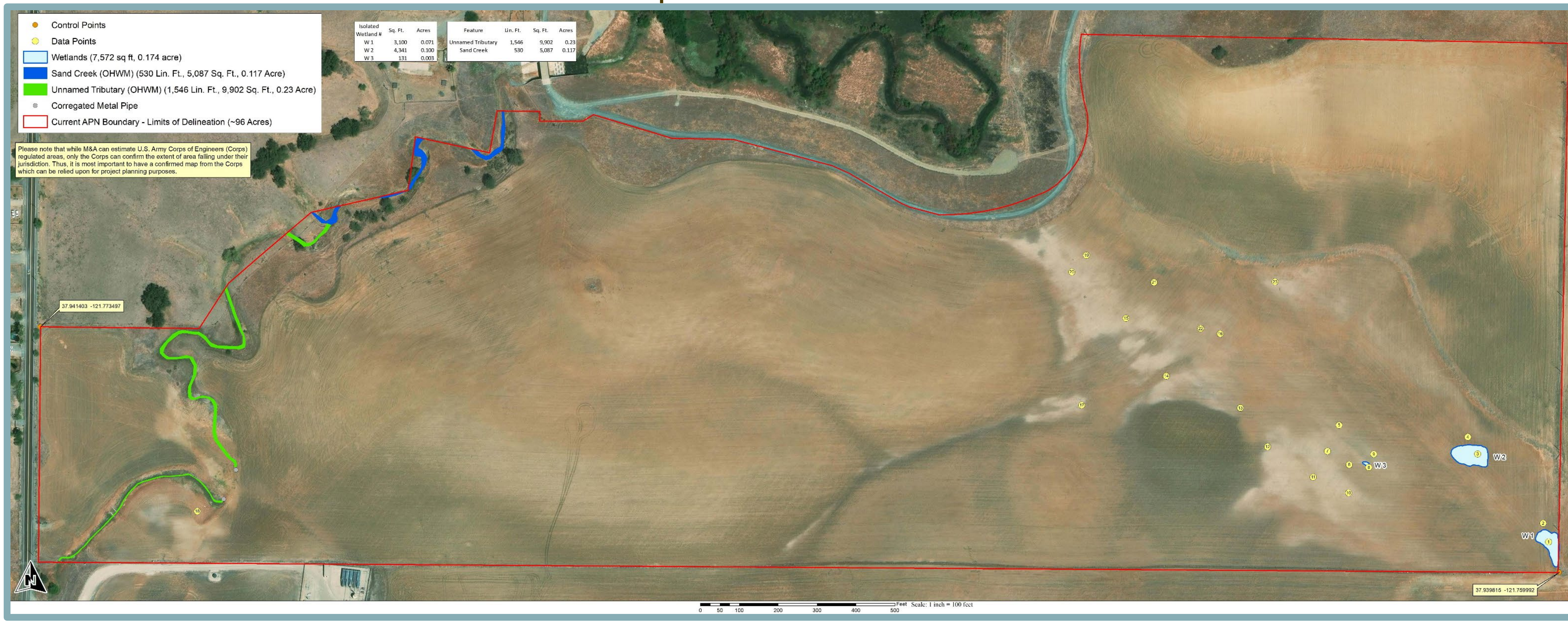
Farmland of Local Importance and Grazing Land. The site does not contain Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, and the site is not currently designated for agriculture by the City's General Plan. Therefore, development of the proposed project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use, or otherwise result in the loss of Farmland to non-agricultural use. Furthermore, the site is not under a Williamson Act Contract. The project is not considered forest land or timberland, and is not zoned for Timberland Production. Therefore, the proposed project would have *no impact* or a *less-than-significant* impact with regard to agricultural and forest resources.

- *Biological Resources (All Sections):* Per the Initial Study, the proposed project could result in potential impacts to special-status plants and wildlife. Additionally, construction of the proposed emergency vehicle access road could result in permanent and potentially significant impacts to waters of the U.S. and/or the State. However, the Initial Study includes mitigation to reduce such impacts to less-than-significant levels. Given the surrounding area is approved for buildout of single-family residential subdivisions, and most wildlife in the area would use the adjacent Sand Creek and associated tributary as a local movement corridor, which would remain undisturbed in designated open spaces, impacts related to wildlife corridors and nursery sites were determined to be less-than-significant. The possibility exists that existing trees would require removal during construction; thus, the Initial Study includes mitigation to ensure compliance with the City's Tree Preservation and Regulation Ordinance. The project site is not located in an area subject to an approved Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP); therefore, no impact would occur regarding a conflict with an HCP/NCCP. Overall, the Initial Study concluded that the proposed project would result in *no impact* or *less-than-significant* impacts with implementation of mitigation related to biological resources.

  It should be noted that since the Initial Study was prepared for the proposed project, the project applicant contracted with Monk & Associates to prepare an additional Biological Resources Analysis (BRA) for the project site. As part of the Monk & Associates BRA, an Aquatic Resources Delineation (ARD) was conducted and submitted to the U.S. Army Corp of Engineers (USACE) (see Figure 4.0-1). The ARD was certified by the USACE on January 30, 2023 (see Appendix C). According to the certified ARD, as shown in Figure 4.0-1, a total of 0.174-acre of wetlands, 0.117-acre of Sand Creek, and 0.23-acre of unnamed tributary are located within the project site. The acreage of aquatic resources on-site differ from what is presented on Figure 11 of the Live Oak Associates Technical Biological Report (TBR), which includes a 9.26-acre Dry Farmed Agriculture/Wetland complex area, as well as three separate wetland areas. The ARD conducted by Monk & Associates and certified by the USACE satisfies the requirements of Mitigation Measure IV-12(a) included in the Initial Study and supersedes the aquatic resources information within the Live Oak Associates TBR. However, Mitigation Measures IV-12(b) and IV-12(c) would still be required to ensure impacts on riparian habitat, sensitive natural communities, or State or federally protected wetlands are less than significant.

  Live Oak Associates reviewed the applicant-provided BRA to determine if modifications to their previously prepared TBR were needed, and prepared a revised TBR to address such modifications (see Appendix D).

Figure 4.0-1
Aquatic Resources Delineation



Based on the revised TBR prepared by Live Oak Associates, the following Mitigation Measures included in the Initial Study prepared for the proposed project are hereby revised as follows:

IV-6(b). *Prior to initiation of ground-disturbing activities, a protocol-level survey shall be conducted to assess the presence or absence of listed fairy shrimp within the project site. Surveys shall occur in a year wet enough to fill ephemeral wetlands for the USFWS to accept the results of the surveys. Should the surveys confirm absence of listed fairy shrimp, no further action will be necessary.*

Should the surveys identify listed fairy shrimp, to mitigate for permanent impacts to shrimp habitat, the project applicant shall preserve occupied and potentially occupied habitat at a minimum 2~~3~~:1 ratio (preserved:impacted) and create additional habitat at a minimum 2:1 ratio (created:impacted). Preservation or created habitat shall be via the purchase of mitigation land in fee title or via recordation of a conservation easement over the mitigation land preserving it in perpetuity as wildlife habitat. The easement shall be granted to a qualified conservation organization as defined by Section 815.3 of the California Civil Code. The preserved or created habitat shall be established at least a year prior to on-site impacts to vernal pool fairy shrimp or vernal pool tadpole shrimp habitat in order to monitor the new habitat's effectiveness, including a comparison to the existing on-site habitat with regards to appropriate hydrology for shrimp. Once the determination has been made that the created habitat supports the appropriate hydrology, the top four inches of topsoil of the on-site habitat planned to be impacted can be transferred to the mitigation site in the same day. Removal and placement of this topsoil shall be done in a systematic fashion that will avoid compaction of the soil.

Prior to the start of construction, the project applicant shall prepare and submit to the City of Antioch a Habitat Mitigation and Management Plan (HMMP), which shall outline the requirements for managing preserved areas and created areas for five years, as well as success criteria for the created habitat. The HMMP will follow the guidelines for mitigation and monitoring of vernal pools issued by the USFWS (1994). The project applicant shall also establish an endowment fund, or other funding mechanism to provide for the long-term management, maintenance, and monitoring of the mitigation site.

In lieu of the above, prior to construction, the project applicant may purchase credits at a 1:1 ratio from an approved mitigation bank.

The project applicant may satisfy the requirements of this mitigation measure by providing the City of Antioch Community Development Department with a copy of a biological opinion issued by the USFWS that includes these, or other functionally equivalent, habitat preservation measures prior to the start of construction.

As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. *Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or*
2. *Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.*

If breeding habitat is planned to be removed, in addition to evaluating the potential of the project to affect listed fairy shrimp under CEQA, the applicant would need to comply with provisions of the federal Endangered Species Act and would need to seek take authorization from the USFWS for project-related losses as required by law. To obtain a take permit, consultation with the USFWS would need to be initiated either through a federal nexus (i.e., Section 7 consultation, usually through the USACE or the Bureau of Land Management) or through the HCP process (i.e., Section 10 consultation).

IV-7(b) *Prior to initiation of ground-disturbing activities, a qualified biologist shall conduct a preconstruction survey of the seasonal wetlands in the eastern portion of the project site during the rainy season in order to determine whether they could be classified as breeding habitat for the California tiger salamander. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department. If breeding habitat is not identified, further mitigation is not necessary. If the seasonal wetland is determined to be breeding habitat and cannot be avoided, the project applicant shall compensate for the loss of upland habitat at a minimum of a 2~~3~~:1 impacts to replacement ratio. Mitigation land shall be permanently protected land within the Central California Distinct Population Segment (DPS) range of the California tiger salamander within 1.3 miles of a known breeding site, or as otherwise approved by CDFW and USFWS. Protection shall be accomplished through the purchase of the mitigation land in fee title or via recordation of a conservation easement over the mitigation land. In lieu of this mitigation prior to construction, the project applicant may purchase California tiger salamander credits at a 1:1 ratio from an approved mitigation bank.*

In addition, if breeding habitat is planned to be removed, the applicant shall comply with the provisions of the federal Endangered Species Act and shall obtain take authorization from the USFWS for project-related losses of the California tiger salamander habitat, as required by law. To obtain a take permit, consultation with the USFWS would need to be initiated either through a federal nexus (Section 7 consultation, usually through

> *the U.S. Army Corps of Engineers (USACE) or the Bureau of Land Management. Proof of compliance shall be submitted to the City of Antioch Community Development Department.*
>
> *As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:*
>
> 1. *Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or*
> 2. *Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.*

Several additional differences between the Live Oak revised TBR and the Monk & Associates BRA were noted. Specifically, the TBR states that impacts to San Joaquin kit fox from the proposed project could be potentially significant and warrants mitigation, while the TBR determined that impacts to San Joaquin kit fox would not occur. In addition, the Live Oak TBR states a line-of-site exists between the project site and a known Golden Eagle nest roughly 0.5-mile away and warrants mitigation, while the BRA determined that the nest does not have a line of sight to the project site, and impacts to Golden Eagle would not occur. The TBR also states that suitable aquatic habitat exists on the project site for vernal pool tadpole shrimp, while the BRA determined that the seasonal wetlands onsite are not suitable for vernal pool tadpole shrimp as they are too shallow and small in area for the species. Finally, the TBR concludes that Sand Creek, its ephemeral tributary, and the seasonal wetlands on the project site are suitable breeding habitat for California tiger salamander, while the BRA concluded that the aquatic resources are not suitable breeding habitat for the species. However, while the TBR includes additional mitigation measures for San Joaquin kit fox, Golden Eagle, vernal pool tadpole shrimp, and California tiger salamander that are not included in the BRA, the measures can be completed concurrently with other similar measures required as part of the proposed project. Therefore, the mitigation measures included in the TBR for San Joaquin kit fox, Golden Eagle, vernal pool tadpole shrimp, and California tiger salamander would not require significant additional effort or expenses to the project proponent. It should be noted that the adjacent Creekside/Vineyards at Sand Creek Project was also subject to mitigation for San Joaquin kit fox, Golden Eagle, and California tiger salamander.

- *Cultural Resources (All Sections).* According to the Initial Study, the project site and the off-site improvement areas do not contain any known historical or cultural resources. The Initial Study includes mitigation sufficient to ensure that, in the event resources are encountered during construction, impacts would be reduced to a *less-than-significant* level.

- *Energy (All Sections):* The proposed project is anticipated to result in increased energy usage during construction and operations of the project. However, the energy usage would not be considered a wasteful, inefficient, or unnecessary consumption of energy resources and would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Thus, the proposed project would result in a *less-than-significant* impact related to energy.

- *Geology and Soils (All Sections):* Due to the site's proximity to nearby active faults, the potential exists for the proposed residential buildings to be subject to seismic ground shaking. However, conformance with the appropriate engineering standards set forth by the California Building Standards Code (CBSC) and design standards enforced through the City of Antioch Building Division would ensure that impacts related to seismic surface rupture and strong seismic ground shaking would be less than significant. In addition, the potential for liquefaction, landslides, lateral spreading, and subsidence/settlement is low, and the Initial Study includes mitigation sufficient to ensure that impacts related to expansive soils and soil erosion would be reduced to less-than-significant levels. Furthermore, while the potential exists for the project to result in the uncovering of paleontological fossils, the Initial Study includes mitigation sufficient to ensure that, in the event such resources are encountered during construction, significant impacts would not occur. Overall, impacts related to geology and soils would be *less than significant.*

- *Hazards and Hazardous Materials (All Sections):* The potential exists for ground-disturbing activities related to the proposed project to encounter oil/gas pipelines associated with former petroleum extraction operations on the project site. However, the Initial Study includes mitigation to reduce the impacts associated with hazardous materials being released into the environment to a less-than-significant level. As noted in the Initial Study, the proposed project would not involve the routine transport, use, or disposal of hazardous materials. The project site is not located within a quarter mile of any existing or proposed schools. In addition, the project site is not identified on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. The project site is not located within two miles of any public airports, and does not fall within an airport land use plan area. The Initial Study concluded that development of the proposed project would not impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. The proposed project would not expose people or structures to the risk of loss, injury or death involving wildland fires. Overall, the proposed project would result in *no impact* or *less-than-significant* impacts with implementation of mitigation related to hazards and hazardous materials.

- *Hydrology and Water Quality (All Sections):* The proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge and would not conflict with an applicable groundwater management plan or water quality control plan. While the proposed project would alter the existing drainage pattern of the site through the addition of impervious surfaces, the project would comply with applicable standards related to stormwater management and would not result in substantial risks related to flooding or erosion. Due to the project's distance from the coast and other large bodies of water, impacts related to tsunamis or seiches would not occur. The Initial Study determined that a potentially significant impact with regard to violation of water quality standards and degradation of water quality could occur. However, the Initial Study includes mitigation measures to reduce such impacts to a less-than-significant level. Overall, impacts related to hydrology and water quality would be *less than significant*.

  It should be noted that a comment letter on the NOP by the Contra Costa County Flood Control and Water Conservation District (CCCFCD) was received on November 15, 2021.

The majority of comments included in the letter can be addressed by information provided within the Initial Study. However, the CCCFCD requested a map of the watersheds where the project is located, including watershed boundaries, which has been included as Figure 4.0-2, below. As shown in Figure 4.0-2, the eastern two-thirds of the site has historically drained to the unnamed creek along the east side of the Creekside/Vineyards at Sand Creek Project, and the western one-third of the site has historically drained to Horse Creek. The grading concept for the proposed project has considered the historical drainage patterns of the site, and project runoff would be conveyed to a watercourse with a defined bed and bank through the proposed storm drain system. The CCCFCD also requested that hydrological studies prepared for the proposed project use Contra Costa County's hydrology and hydrograph standards, and that impacts of the proposed project's runoff due to the increase in duration (length of time) of flows and the effect on creeks and channels downstream of the project be addressed. The Preliminary Stormwater Control Plan and EVA Culvert Sizing Analysis were prepared for the proposed project using the County design standards. Further, the proposed project is required to meet the hydromodification requirements in the City's National Pollutant Discharge Elimination System (NPDES) permit. Based on the preliminary design of the proposed project, the combination detention basin and water quality facility would satisfy such requirements. Nonetheless, the City would require, as a condition of project approval, that a final stormwater management plan (SWMP) be submitted to the City for review and approval in conjunction with the project construction documents to ensure all County requirements have been met.

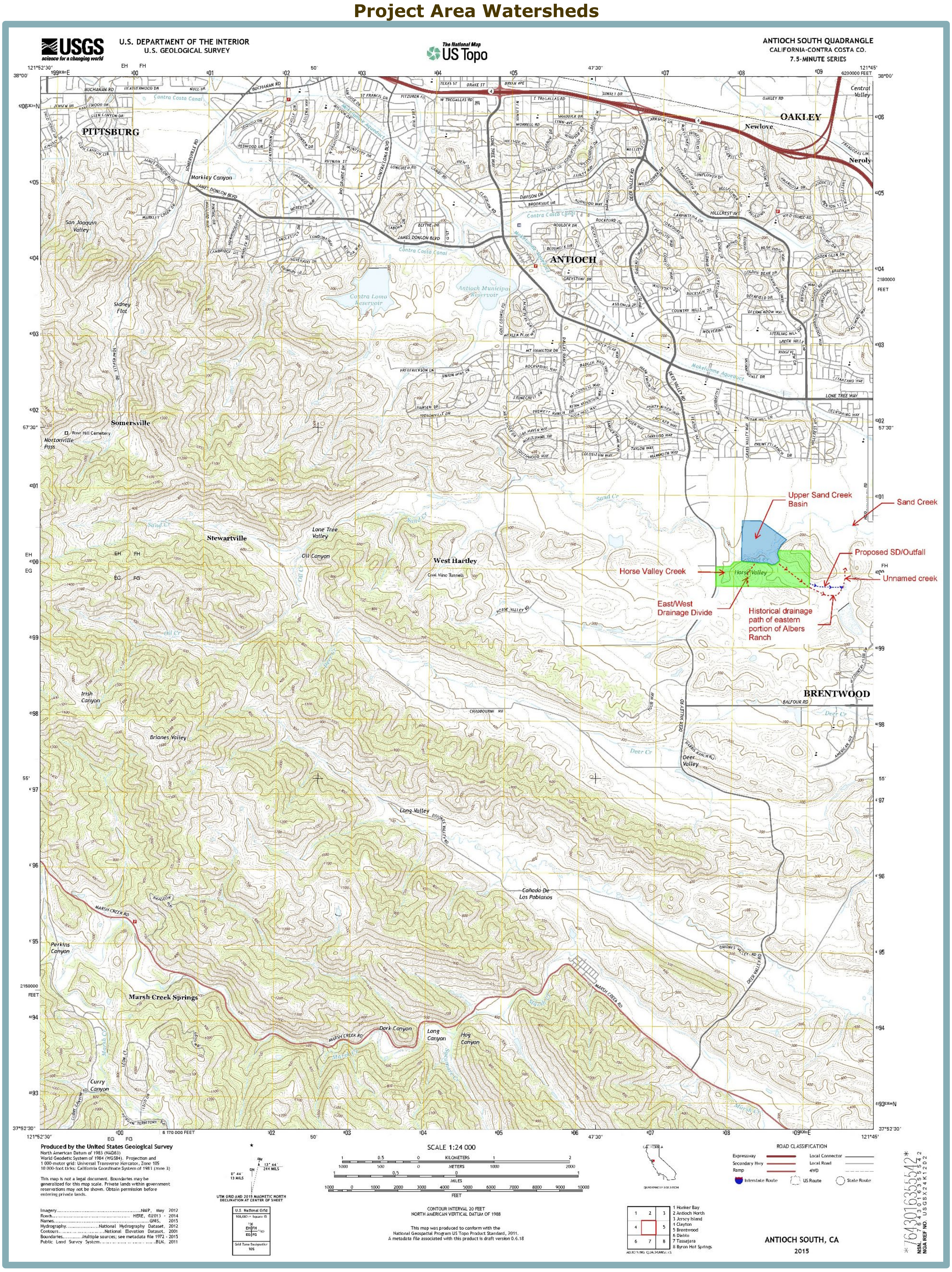
- *Land Use and Planning (All Sections):* The proposed project would not physically divide an established community or conflict with City policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect. The project would be consistent with nearby urban development. As such, the proposed project would result in a *less-than-significant* impact.

- *Mineral Resources (All Sections):* The project site does not constitute a likely source of minerals that would be of value to the region or residents of the State. Because the proposed project would not result in the loss of availability of a known mineral resource or locally important recovery site, *no impact* would occur.

- *Noise (All Sections):* Vibration generated by construction activities associated with the proposed project would fall below the threshold at which vibration levels become distinctly perceptible. Additionally, the project site is not located within an airport land use plan or in the vicinity of a private airstrip. The Initial Study determined that the proposed project could generate a substantial temporary or permanent increase in ambient noise levels. However, the Initial Study includes mitigation to ensure compliance with the applicable standards during construction and operation of the proposed project. Overall, the proposed project would result in *no impact* or a *less-than-significant* impact related to noise.

- *Population and Housing (All Sections):* The project site is currently vacant; thus, the proposed project would not result in the displacement of existing housing or residents. While the proposed project would directly induce population growth in the area, population growth itself does not constitute an environmental impact.

Figure 4.0-2
Project Area Watersheds



Rather, increased demands on the physical environment resulting from increases in population are considered environmental impacts. Physical environmental effects associated with development of the proposed project area would be evaluated throughout the Initial Study and this EIR. Therefore, the proposed project would result in *no impact* or a *less-than-significant* impact related to population and housing.

- *Public Services (All Sections):* The project would be required to comply with General Plan policies and to pay development fees that support emergency police and fire services. In addition, the project would be required to pay applicable fees to the Antioch Unified School District (AUSD). The proposed project would meet the park dedication requirements established by Section 9-4.1005 through 9-4.1007 of the Antioch Municipal Code through dedication of parkland, payment of in-lieu park fees, or a combination of both. Overall, the proposed project would result in a *less-than-significant* impact related to public services.

- *Recreation (All Items):* The proposed project would include the construction of new park facilities within the project site and would be required to comply with the City's parkland requirements. While the project would include the construction of new park facilities within the project site, the physical effects associated with construction of such facilities has been evaluated throughout the Initial Study and this EIR. Overall, a *less-than-significant* impact would occur related to recreation.

- *Tribal Cultural Resources (All Items):* Based on the history of disturbance at the project site as a result of past development and agricultural uses, as well as the lack of identified tribal cultural resources at the site, known tribal cultural resources are not expected to occur within the site. Nevertheless, in the event that tribal cultural resources are discovered on the site during construction, the Initial Study includes mitigation sufficient to reduce any potential impacts to a *less-than-significant* level.

- *Utilities and Service Systems (All Sections):* The proposed project would not require or result in the relocation or construction of new or expanded water, storm drainage, or sewer infrastructure. Sufficient capacity of existing utilities and service systems exists to adequately serve the proposed project. Therefore, the proposed project would result in a *less-than-significant* impact related to utilities and service systems.

- *Wildfire (All Sections):* According to the California Department of Forestry and Fire Protection, the Fire and Resource Assessment Program indicates that the project site is not located within or adjacent to a Very High Fire Hazard Severity Zone. In addition, the site is not located in or near a State Responsibility Area. Thus, the proposed project would not be expected to be subject to or result in substantial adverse effects related to wildfires, and a *less-than-significant* impact would occur.

- *Mandatory Findings of Significance (a):* Implementation of the proposed project would have the potential to result in adverse effects to special-status plant and wildlife species, in addition to eliminating important examples of major historical or cultural resources. However, the project would be required to comply with applicable General Plan and Municipal Code policies in addition to the mitigation measures provided by the Initial Study that would reduce any potential impacts to *less-than-significant* levels.

4.0.4 ENVIRONMENTAL ISSUES ADDRESSED IN THIS EIR

The EIR provides the analysis necessary to address the technical environmental impacts of the proposed project. The following environmental issues are addressed in this EIR:

- Air Quality and Greenhouse Gas Emissions; and
- Transportation.

See Chapter 5, Section 5.3, for additional information on the scope of the cumulative impact analysis for each environmental issue addressed in the EIR.

4.0.5 CHAPTER FORMAT

Each technical chapter addressing a specific environmental issue begins with an **introduction** describing the purpose of the section. The introduction is followed by a description of the project's **existing environmental setting** as the setting pertains to that particular issue. The setting description is followed by the **regulatory context** and the **impacts and mitigation measures** discussion, which contains the **standards of significance**, followed by the **method of analysis**. The **impact and mitigation** discussion includes impact statements prefaced by a number in bold-faced type (for both project-level and cumulative analyses). An explanation of each impact and an analysis of the impact's significance follow each impact statement. All mitigation measures pertinent to each individual impact follow directly after the impact statement (see below). The degree of relief provided by identified mitigation measures is also evaluated. An example of the format is shown below.

Project-Specific Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in comparison with the standards of significance.

4.x-1 Statement of Project-Specific Impact

Discussion of impact for the proposed project in paragraph format.

Statement of ***level of significance*** of impact prior to mitigation is included at the end of each impact discussion. The following levels of significance are used in the EIR: less than significant, significant, or significant and unavoidable. If an impact is determined to be significant, mitigation will be included in order to reduce the specific impact to the maximum extent feasible.

Mitigation Measure(s)

Statement of *level of significance* after the mitigation is included immediately preceding mitigation measures.

4.x-1(a) *Required mitigation measure(s) presented in italics and listed in consecutive order.*

4.x-1(b) *Required additional mitigation measure, if necessary.*

Cumulative Impacts and Mitigation Measures

The following discussion of cumulative impacts is based on implementation of the proposed project in combination with cumulative development within the applicable area or region.

4.x-2 Statement of Cumulative Impact

Discussion of cumulative impacts for the proposed project in paragraph format.

As discussed in detail in Chapter 5, Statutorily Required Sections, of the EIR, the cumulative setting for the proposed project is generally considered to be development anticipated to occur upon buildout of the Antioch General Plan (i.e., Antioch City limits), as well as buildout of a number of approved or reasonably foreseeable projects within the project region.

Statement of ***level of significance*** of cumulative impact prior to mitigation is included at the end of each impact discussion. The following levels of significance are used in the EIR for cumulative impacts: less than significant, less than cumulatively considerable, cumulatively considerable, or significant and unavoidable. If an impact is determined to be cumulatively considerable, mitigation will be included in order to reduce the specific impact to the maximum extent feasible.

Mitigation Measure(s)

Statement of *level of significance* after the mitigation is included immediately preceding mitigation measures.

4.x-2(a) *Required mitigation measure(s) presented in italics and listed in consecutive order.*

4.x-2(b) *Required additional mitigation measure, if necessary.*

4.1 Air Quality and Greenhouse Gas Emissions

4.1 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

4.1.1 INTRODUCTION

The Air Quality and Greenhouse Gas Emissions chapter of the EIR describes the potential impacts of the proposed project on local and regional air quality emissions, and potential impacts related to greenhouse gas (GHG) emissions and climate change. The chapter includes a discussion of the existing air quality and GHG setting, construction-related air quality impacts resulting from grading and equipment emissions, direct and indirect emissions associated with operations of the project, the impacts of these emissions on both the local and regional scale, and mitigation measures warranted to reduce or eliminate any identified significant impacts. The chapter relies on information obtained from the City of Antioch General Plan[1] and associated EIR,[2] the California Emissions Estimator Model (CalEEMod) version 2020.4.0,[3] and is primarily based on information, guidance, and analysis protocol provided by the Bay Area Air Quality Management District (BAAQMD).

4.1.2 EXISTING ENVIRONMENTAL SETTING

The following information provides an overview of the existing environmental setting in relation to air quality within the proposed project area. Air basin characteristics, ambient air quality standards (AAQS), attainment status and regional air quality plans, local air quality monitoring, odors, sensitive receptors, and GHGs are discussed.

Air Basin Characteristics

The project site is located in the eastern portion of the nine-county San Francisco Bay Area Air Basin (SFBAAB), and is within the jurisdictional boundaries of the BAAQMD. The SFBAAB consists of coastal mountain ranges, inland valleys, and bays. The proposed project is located on the south side of the San Joaquin River delta, east of the Carquinez Strait, and would be considered to be within the Carquinez Strait region of the SFBAAB. Being located between the greater Bay Area and the Central Valley has great influence on the climate and air quality of the area. During the summer and fall months, marine air is drawn eastward through the Carquinez Strait, with common wind speeds of 15 to 20 miles per hour throughout the region. The general west-to-east flow of the winds in the straits tends to move pollutants east. Thus, the winds dilute pollutants and transport them away from the area, so that emissions released in the project area have more influence on air quality in the Sacramento and San Joaquin Valleys than locally. However, stationary sources located in upwind cities could influence the local air quality.

Average daily maximum temperatures (in degrees Fahrenheit) are in the mid to high 50s in the winter and the high 80s in the summer. Average minimum temperatures are in the high 30s to low 40s in the winter and the mid-50s in the summer. Rainfall amounts in the region vary from 14.4 inches annually in Antioch to 22 inches annually in Fairfield.

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1 City of Antioch. *City of Antioch General Plan*. Updated November 24, 2003.
2 City of Antioch. *General Plan Update Environmental Impact Report*. July 2003.
3 California Air Pollution Control Officers Association. *California Emissions Estimator Model User Guide Version 2020.4.0*. May 2021.

Ambient Air Quality Standards

Both the U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) have established AAQS for common pollutants. The federal standards are divided into primary standards, which are designed to protect the public health, and secondary standards, which are designed to protect the public welfare. AAQS for each contaminant represent safe levels that avoid specific adverse health effects. Pollutants for which air quality standards have been established are called “criteria” pollutants. Table 4.1-1 identifies the major pollutants, characteristics, health effects and typical sources. The federal and California ambient air quality standards (NAAQS and CAAQS, respectively) are summarized in Table 4.1-2. The NAAQS and CAAQS were developed independently with differing purposes and methods. As a result, the federal and State standards differ in some cases. In general, the State of California standards are more stringent than the federal standards, particularly for ozone and particulate matter (PM).

A description of each criteria pollutant and its potential health effects is provided in the following section.

Ozone

Ozone is a reactive gas consisting of three oxygen atoms. In the troposphere, ozone is a product of the photochemical process involving the sun's energy, and is a secondary pollutant formed as a result of a complex chemical reaction between reactive organic gases (ROG) and oxides of nitrogen (NO_X) emissions in the presence of sunlight. As such, unlike other pollutants, ozone is not released directly into the atmosphere from any sources. In the stratosphere, ozone exists naturally and shields Earth from harmful incoming ultraviolet radiation. The primary source of ozone precursors is mobile sources, including cars, trucks, buses, construction equipment, and agricultural equipment.

Ground-level ozone reaches the highest level during the afternoon and early evening hours. High levels occur most often during the summer months. Ground-level ozone is a strong irritant that could cause constriction of the airways, forcing the respiratory system to work harder in order to provide oxygen. Ozone at the Earth's surface causes numerous adverse health effects and is a major component of smog. High concentrations of ground level ozone can adversely affect the human respiratory system and aggravate cardiovascular disease and many respiratory ailments.

Reactive Organic Gas

ROG refers to several reactive chemical gases composed of hydrocarbon compounds typically found in paints and solvents that contributes to the formation of smog and ozone by involvement in atmospheric chemical reactions. A separate health standard does not exist for ROG. However, some compounds that make up ROG are toxic, such as the carcinogen benzene.

Oxides of Nitrogen

NO_X are a family of gaseous nitrogen compounds and are precursors to the formation of ozone and particulate matter. The major component of NO_X, nitrogen dioxide (NO_2), is a reddish-brown gas that discolors the air and is toxic at high concentrations. NO_X results primarily from the combustion of fossil fuels under high temperature and pressure. On-road and off-road motor vehicles and fuel combustion are the major sources of NO_X. NO_X reacts with ROG to form smog, which could result in adverse impacts to human health, damage the environment, and cause poor visibility. Additionally, NO_X emissions are a major component of acid rain. Health effects related to NO_X include lung irritation and lung damage and can cause increased risk of acute and chronic respiratory disease.

Table 4.1-1
Summary of Criteria Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
Ozone	A highly reactive gas produced by the photochemical process involving a chemical reaction between the sun's energy and other pollutant emissions. Often called photochemical smog.	• Eye irritation • Wheezing, chest pain, dry throat, headache, or nausea • Aggravated respiratory disease such as emphysema, bronchitis, and asthma	Combustion sources such as factories, automobiles, and evaporation of solvents and fuels.
Carbon Monoxide	An odorless, colorless, highly toxic gas that is formed by the incomplete combustion of fuels.	• Impairment of oxygen transport in the bloodstream • Impaired vision, reduced alertness, chest pain, and headaches • Can be fatal in the case of very high concentrations	Automobile exhaust, combustion of fuels, and combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide	A reddish-brown gas that discolors the air and is formed during combustion of fossil fuels under high temperature and pressure.	• Lung irrigation and damage • Increased risk of acute and chronic respiratory disease	Automobile and diesel truck exhaust, industrial processes, and fossil-fueled power plants.
Sulfur Dioxide	A colorless, irritating gas with a rotten egg odor formed by combustion of sulfur-containing fossil fuels.	• Aggravation of chronic obstruction lung disease • Increased risk of acute and chronic respiratory disease	Diesel vehicle exhaust, oil-powered power plants, and industrial processes.
Particulate Matter (PM_{10} and $PM_{2.5}$)	A complex mixture of extremely small particles and liquid droplets that can easily pass through the throat and nose and enter the lungs.	• Aggravation of chronic respiratory disease • Heart and lung disease • Coughing • Bronchitis • Chronic respiratory disease in children • Irregular heartbeat • Nonfatal heart attacks	Combustion sources such as automobiles, power generation, industrial processes, and wood burning. Also from unpaved roads, farming activities, and fugitive windblown dust.
Lead	A metal found naturally in the environment as well as in manufactured products.	• Loss of appetite, weakness, apathy, and miscarriage • Lesions of the neuromuscular system, circulatory system, brain, and gastrointestinal tract	Industrial sources and combustion of leaded aviation gasoline.

Sources:

- ***California Air Resources Board. California Ambient Air Quality Standards (CAAQS). Available at: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards. Accessed March 2022.***
- ***Sacramento Metropolitan, El Dorado, Feather River, Placer, and Yolo-Solano Air Districts, Spare the Air website. Air Quality Information for the Sacramento Region. Available at: sparetheair.com. Accessed March 2022.***
- ***California Air Resources Board. Glossary of Air Pollution Terms. Available at: https://ww2.arb.ca.gov/glossary. Accessed March 2022.***

Table 4.1-2 Ambient Air Quality Standards				
Pollutant	**Averaging Time**	**CAAQS**	**NAAQS Primary**	**NAAQS Secondary**
Ozone	1 Hour	0.09 ppm	-	Same as primary
	8 Hour	0.070 ppm	0.070 ppm	
Carbon Monoxide	8 Hour	9 ppm	9 ppm	-
	1 Hour	20 ppm	35 ppm	
Nitrogen Dioxide	Annual Mean	0.030 ppm	53 ppb	Same as primary
	1 Hour	0.18 ppm	100 ppb	-
Sulfur Dioxide	24 Hour	0.04 ppm	-	-
	3 Hour	-	-	0.5 ppm
	1 Hour	0.25 ppm	75 ppb	-
Respirable Particulate Matter (PM_{10})	Annual Mean	20 ug/m^3	-	Same as primary
	24 Hour	50 ug/m^3	150 ug/m^3	
Fine Particulate Matter ($PM_{2.5}$)	Annual Mean	12 ug/m^3	12 ug/m^3	15 ug/m^3
	24 Hour	-	35 ug/m^3	Same as primary
Lead	30 Day Average	1.5 ug/m^3	-	-
	Calendar Quarter	-	1.5 ug/m^3	Same as primary
Sulfates	24 Hour	25 ug/m^3	-	-
Hydrogen Sulfide	1 Hour	0.03 ppm	-	-
Vinyl Chloride	24 Hour	0.010 ppm	-	-
Visibility Reducing Particles	8 Hour	see note below	-	-

ppm = parts per million
ppb = parts per billion
μg/m^3 = micrograms per cubic meter

Note: Statewide Visibility Reducing Particle Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

***Source:** California Air Resources Board. Ambient Air Quality Standards. May 4, 2016. Available at: https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf. Accessed March 2022.*

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, poisonous gas produced by incomplete burning of carbon-based fuels such as gasoline, oil, and wood. When CO enters the body, the CO combines with chemicals in the body, which prevents blood from carrying oxygen to cells, tissues, and organs. Symptoms of exposure to CO can include problems with vision, reduced alertness, and general reduction in mental and physical functions. Exposure to CO can result in chest pain, headaches, reduced mental alertness, and death at high concentrations.

Sulfur Dioxide

Sulfur Dioxide (SO_2) is a colorless, irritating gas with a rotten egg odor formed primarily by the combustion of sulfur-containing fossil fuels from mobile sources, such as locomotives, ships, and off-road diesel equipment. SO_2 is also emitted from several industrial processes, such as petroleum refining and metal processing. Similar to airborne NO_X, suspended sulfur oxide particles contribute to poor visibility. The sulfur oxide particles are also a component of particulate matter, discussed below.

Particulate Matter

Particulate matter, also known as particle pollution or PM, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health impacts. The USEPA is concerned about particles that are 10 micrometers in diameter or smaller (PM_{10}) because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, the particles could affect the heart and lungs and cause serious health effects. USEPA groups particle pollution into three categories based on their size and where they are deposited:

- "Inhalable coarse particles ($PM_{2.5-10}$)," which are found near roadways and dusty industries, are between 2.5 and 10 micrometers in diameter. $PM_{2.5-10}$ is deposited in the thoracic region of the lungs.
- "Fine particles ($PM_{2.5}$)," which are found in smoke and haze, are 2.5 micrometers in diameter and smaller. $PM_{2.5}$ particles could be directly emitted from sources such as forest fires, or could form when gases emitted from power plants, industries, and automobiles react in the air. They penetrate deeply into the thoracic and alveolar regions of the lungs.
- "Ultrafine particles (UFP)," are very, very small particles (less than 0.1 micrometers in diameter) largely resulting from the combustion of fossil fuels, meat, wood, and other hydrocarbons. While UFP mass is a small portion of $PM_{2.5}$, their high surface area, deep lung penetration, and transfer into the bloodstream could result in disproportionate health impacts relative to their mass. UFP is not currently regulated separately, but is analyzed as part of $PM_{2.5}$.

PM_{10}, $PM_{2.5}$, and UFP include primary pollutants, which are emitted directly to the atmosphere and secondary pollutants, which are formed in the atmosphere by chemical reactions among precursors. Generally speaking, $PM_{2.5}$ and UFP are emitted by combustion sources like vehicles, power generation, industrial processes, and wood burning, while PM_{10} sources include the same sources plus roads and farming activities. Fugitive windblown dust and other area sources also represent a source of airborne dust. Long-term PM pollution, especially fine particles, could result in significant health problems including, but not limited to, the following: increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing; decreased lung function; aggravated asthma; development of chronic respiratory disease in children; development of chronic bronchitis or obstructive lung disease; irregular heartbeat; heart attacks; and increased blood pressure.

Lead

Lead is a relatively soft and chemically resistant metal that is a natural constituent of air, water, and the biosphere. Lead forms compounds with both organic and inorganic substances. As an air pollutant, lead is present in small particles. Sources of lead emissions in California include a variety of industrial activities. Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels. The use of leaded fuel has been mostly phased out, with the result that ambient concentrations of lead have dropped dramatically. However, because lead was emitted in large amounts from vehicles when leaded gasoline was used, lead is present in many soils (especially urban soils) as a result of airborne dispersion and could become re-suspended into the air.

Because lead is only slowly excreted by the human body, exposures to small amounts of lead from a variety of sources could accumulate to harmful levels. Effects from inhalation of lead above the level of the AAQS may include impaired blood formation and nerve conduction. Lead can adversely affect the nervous, reproductive, digestive, immune, and blood-forming systems. Symptoms could include fatigue, anxiety, short-term memory loss, depression, weakness in the extremities, and learning disabilities in children. Lead also causes cancer.

Sulfates

Sulfates are the fully oxidized ionic form of sulfur and are colorless gases. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. The sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.

The sulfates standard established by CARB is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and, because they are usually acidic, can harm ecosystems and damage materials and property.

Hydrogen Sulfide

Hydrogen Sulfide (H_2S) is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations. Hydrogen sulfide is extremely hazardous in high concentrations, especially in enclosed spaces (800 parts per million [ppm] can cause death).

Vinyl Chloride

Vinyl Chloride (C_2H_3Cl, also known as VCM) is a colorless gas that does not occur naturally, but is formed when other substances such as trichloroethane, trichloroethylene, and tetrachloro-ethylene are broken down. Vinyl chloride is used to make polyvinyl chloride (PVC) which is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials.

Visibility Reducing Particles

Visibility Reducing Particles are a mixture of suspended particulate matter consisting of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. The standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are also a category of environmental concern. TACs are present in many types of emissions with varying degrees of toxicity. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases. Common stationary sources of TACs include gasoline stations, dry cleaners, and diesel backup generators, which are subject to BAAQMD stationary source permit requirements. The other, often more significant, common source type is on-road motor vehicles, such as cars and trucks, on freeways and roads, and off-road sources such as construction equipment, ships, and trains.

Fossil fueled combustion engines, including those used in cars, trucks, and some pieces of construction equipment, release at least 40 different TACs. In terms of health risks, the most volatile contaminants are diesel particulate matter (DPM), benzene, formaldehyde, 1,3-butadiene, toluene, xylenes, and acetaldehyde. Gasoline vapors contain several TACs, including benzene, toluene, and xylenes. Diesel engines emit a complex mixture of air pollutants, including both gaseous and solid material. The solid material in diesel exhaust, DPM, is composed of carbon particles and numerous organic compounds, including over 40 known cancer-causing organic substances. Examples of such chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. Diesel exhaust also contains gaseous pollutants, including volatile organic compounds and NO_X. Due to the published evidence of a relationship between diesel exhaust exposure and lung cancer and other adverse health effects, the CARB has identified DPM from diesel-fueled engines as a TAC. Although a variety of TACs are emitted by fossil fueled combustion engines, the cancer risk due to DPM exposure represents a more significant risk than the other TACs discussed above.[4]

More than 90 percent of DPM is less than one micrometer in diameter, and, thus, DPM is a subset of $PM_{2.5}$. As a California statewide average, DPM comprises about eight percent of $PM_{2.5}$ in outdoor air, although DPM levels vary regionally due to the non-uniform distribution of sources throughout the State. Most major sources of diesel emissions, such as ships, trains, and trucks, operate in and around ports, rail yards, and heavily-traveled roadways. Such areas are often located near highly populated areas. Accordingly, elevated DPM levels are mainly an urban problem, with large numbers of people exposed to higher DPM concentrations, resulting in greater health consequences compared to rural areas.

Due to the high levels of diesel activity, high volume freeways, stationary diesel engines, rail yards and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. Construction-related activities also have the potential to generate concentrations of DPM from on-road haul trucks and off-road equipment exhaust emissions.

Health risks from TACs are a function of both the concentration of emissions and the duration of exposure, which typically are associated with long-term exposure and the associated risk of contracting cancer. Health effects of exposure to TACs other than cancer include birth defects, neurological damage, and death. Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level. The identification, regulation, and monitoring of TACs is relatively new compared to criteria air pollutants that have established AAQS. TACs are regulated or evaluated on the basis of risk to human health rather than comparison to an AAQS or emission-based threshold.

Attainment Status and Regional Air Quality Plans

The Federal Clean Air Act (FCAA) and the California Clean Air Act (CCAA) require all areas of California to be classified as attainment, nonattainment, or unclassified as to their status with regard to the NAAQS and/or CAAQS. Areas not meeting the NAAQS presented in Table 4.1-2 above are designated by the USEPA as nonattainment. Further classifications of nonattainment

4 California Air Resources Board. *Reducing Toxic Air Pollutants in California's Communities*. February 6, 2002.

areas are based on the severity of the nonattainment problem, with marginal, moderate, serious, severe, and extreme nonattainment classifications for ozone. Nonattainment classifications for PM range from marginal to serious. Because of the differences between the national and State standards, the designation of nonattainment areas is different under the federal and State legislation. The FCAA requires areas violating the NAAQS to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The SIP contains the strategies and control measures for states to use to attain the NAAQS. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, rules, and regulations of air basins as reported by the agencies with jurisdiction over them. The USEPA reviews SIPs to determine if they conform to the mandates of the FCAA amendments and would achieve air quality goals when implemented. The CCAA requires local air pollution control districts with air quality that is in violation of CAAQS to prepare air quality attainment plans that demonstrate district-wide emission reductions of five percent per year averaged over consecutive three-year periods, unless an approved alternative measure of progress is developed.

Table 4.1-3 presents the current attainment status of the SFBAAB, including Contra Costa County. As shown in the table, the area is currently designated as a nonattainment area for the State and federal ozone, State and federal $PM_{2.5}$, and State PM_{10} standards. The SFBAAB is designated attainment or unclassified for all other AAQS.

Table 4.1-3
Contra Costa County Attainment Status Designations

Pollutant	Averaging Time	California Standards	Federal Standards
Ozone	1 Hour	**Nonattainment**	Revoked in 2005
	8 Hour	**Nonattainment**	**Nonattainment**
Carbon Monoxide	8 Hour	Attainment	Attainment
	1 Hour	Attainment	Attainment
Nitrogen Dioxide	Annual Mean	-	Attainment
	1 Hour	Attainment	Unclassified
Sulfur Dioxide	Annual Mean	Attainment	Attainment
	24 Hour	Attainment	Attainment
	3 Hour	-	Unclassified
	1 Hour	Attainment	Attainment
Respirable Particulate Matter (PM_{10})	Annual Mean	**Nonattainment**	-
	24 Hour	**Nonattainment**	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Annual Mean	**Nonattainment**	Attainment
	24 Hour	-	**Nonattainment**
Lead	30 Day Average	-	-
	Calendar Quarter	-	Attainment
	Rolling 3-Month Average	-	Attainment
Sulfates	24 Hour	Attainment	-
Hydrogen Sulfide	1 Hour	Unclassified	-
Visibility Reducing Particles	8 Hour	Unclassified	-

***Source:** Bay Area Air Quality Management District. Air Quality Standards and Attainment Status. Available at: http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status. Accessed May 2022.*

In compliance with the FCAA and CCAA, the BAAQMD periodically prepares and updates air quality plans that provide emission reduction strategies to achieve attainment of the AAQS, including control strategies to reduce air pollutant emissions through regulations, incentive programs, public education, and partnerships with other agencies. The current air quality plans were prepared in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG).

The most recent federal ozone plan is the 2001 Ozone Attainment Plan, which is a proposed revision to the Bay Area part of the SIP to achieve the federal ozone standard.[5] The plan was adopted on October 24, 2001 and approved by the CARB on November 1, 2001.

The most recent State ozone plan is the 2017 Clean Air Plan, adopted on April 19, 2017.[6] The 2017 Clean Air Plan was developed as a multi-pollutant plan that provides an integrated control strategy to reduce ozone, PM, TACs, and GHGs. The control strategies included in the 2017 Clean Air Plan serve as the backbone of the 2017 Clean Air Plan, and build upon existing regional, state, and national programs for emissions reductions. The 2017 Clean Air Plan includes 85 control measures, which provide an integrative approach to reducing ozone, PM, TAC, and GHG emissions. Although a plan for achieving the State PM_{10} standard is not required, the BAAQMD has prioritized measures to reduce PM in developing the control measures for the 2017 Clean Air Plan.

The aforementioned air quality plans contain mobile source controls, stationary source controls, and transportation control measures to be implemented in the region to attain the State and federal AAQS within the SFBAAB. The plans are based on population and employment projections provided by local governments, usually developed as part of the General Plan update process.

Local Air Quality Monitoring

Air quality is monitored by BAAQMD and CARB at various locations in the region that provide information on ambient concentrations of criteria air pollutants and TACs to help determine which air quality standards are being violated, and to direct the BAAQMD emission reduction efforts, such as developing attainment plans and rules, incentive programs, etc. The nearest monitoring station to the project site is the Bethel Island Road monitoring site, which is located approximately eight miles northeast of the project site at 5551 Bethel Island Road. Data for $PM_{2.5}$, was not available for the Bethel Island Road monitoring site; thus, such data was obtained from the next nearest monitoring site, which is the Concord monitoring site, located approximately 14 miles west of the project site at 2975 Treat Boulevard. Table 4.1-4 shows historical occurrences of pollutant levels exceeding the State and federal AAQS for the three-year period from 2018 to 2020. As shown in the table, the State 1-hour ozone, the State and the federal 8-hour ozone, the State PM_{10}, and the federal $PM_{2.5}$ AAQS were exceeded. All other State and federal AAQS were met in the area.

Odors

While offensive odors rarely cause physical harm, they can be unpleasant, leading to considerable annoyance and distress among the public and can generate citizen complaints to local governments and air districts. Adverse effects of odors on residential areas and other sensitive receptors warrant the closest scrutiny; but consideration should also be given to other land use types where people congregate, such as recreational facilities, worksites, and

[5] Bay Area Air Quality Management District. *Air Quality Plans*. Available at: http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans.aspx. Accessed March 2022.
[6] *Ibid.*

commercial areas. The potential for an odor impact is dependent on a number of variables including the nature of the odor source, distance between a receptor and an odor source, and local meteorological conditions.

Table 4.1-4
Air Quality Data Summary for the Bethel Island Road Air Quality Monitoring Site

Pollutant	Standard	Days Standard Was Exceeded		
		2018	2019	2020
1-Hour Ozone	State	0	0	1
	Federal	0	0	0
8-Hour Ozone	State	1	1	2
	Federal	1	1	2
24-Hour PM_{10}	State	--	26.2	--
	Federal	--	0	--
24-Hour $PM_{2.5}$*	Federal	14.2	0	16.2
1-Hour Nitrogen Dioxide	State	0	0	0
	Federal	0	0	0

Notes:
-- Sufficient data was not available.
* Data obtained from the Concord monitoring site.

***Source:** California Air Resources Board, Aerometric Data Analysis and Management (iADAM) System, http://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed May 2022.*

One of the most important factors influencing the potential for an odor impact to occur is the distance between the odor source and receptors, also referred to as a buffer zone or setback. The greater the distance between an odor source and receptor, the less concentrated the odor emission would be when reaching the receptor. Meteorological conditions also affect the dispersion of odor emissions, which determines the exposure concentration of odiferous compounds at receptors. The predominant wind direction in an area influences which receptors are exposed to the odiferous compounds generated by a nearby source. Receptors located upwind from a large odor source may not be affected due to the produced odiferous compounds being dispersed away from the receptors. Wind speed also influences the degree to which odor emissions are dispersed away from any area. The prevailing wind direction in the City of Antioch is from the west.[7]

Odiferous compounds could be generated from a variety of source types including both construction and operational activities. Examples of common land use types that typically generate significant odor impacts include, but are not limited to, wastewater treatment plants; composting/green waste facilities; recycling facilities; petroleum refineries; chemical manufacturing plants; painting/coating operations; rendering plants; and food packaging plants. Although less common, diesel fumes associated with substantial diesel-fueled equipment and heavy-duty trucks, such as from construction activities, freeway traffic, or distribution centers, can be found to be objectionable.

7 WeatherSpark. *Climate and Average Weather Year Round in Antioch California, United States*. Available at: https://weatherspark.com/y/1111/Average-Weather-in-Antioch-California-United-States-Year-Round. Accessed May 2022.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the effects of air pollution. Accordingly, land uses that are typically considered to be sensitive receptors include residences, schools, day care centers, playgrounds, and medical facilities. The nearest sensitive receptors to the project site are the rural residences located to the west, across Deer Valley Road, with the closest being located approximately 90 feet away.

Greenhouse Gas Emissions

GHGs are gases that absorb and emit radiation within the thermal infrared range, trapping heat in the earth's atmosphere. Some GHGs occur naturally and are emitted into the atmosphere through both natural processes and human activities. Other GHGs are created and emitted solely through human activities. The principal GHGs that enter the atmosphere due to human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated carbons. Other common GHGs include water vapor, ozone, and aerosols. Since the beginning of the Industrial Revolution, global atmospheric concentrations of GHGs have increased due to human activities such as the burning of fossil fuels, clearing of forests and other activities. The increase in atmospheric concentrations of GHG due to human activities has resulted in more heat being held within the atmosphere, which is the accepted explanation for global climate change.[8]

The primary GHG emitted by human activities is CO_2, with the next largest components being CH_4 and N_2O. A wide variety of human activities result in the emission of CO_2. Some of the largest sources of CO_2 include the burning of fossil fuels for transportation and electricity, industrial processes including fertilizer production, agricultural processing, and cement production. The primary sources of CH_4 emissions include domestic livestock sources, decomposition of wastes in landfills, releases from natural gas systems, coal mine seepage, and manure management. The main human activities producing N_2O are agricultural soil management, fuel combustion in motor vehicles, nitric acid production, manure management, and stationary fuel combustion. Emissions of GHG by economic sector indicate that energy-related activities account for the majority of U.S. emissions. Electricity generation is the largest single-source of GHG emissions, and transportation is the second largest source, followed by industrial activities. The agricultural, commercial, and residential sectors account for the remainder of GHG emission sources.[9]

Emissions of GHG are partially offset by uptake of carbon and sequestration in trees, agricultural soils, landfilled yard trimmings and food scraps, and absorption of CO_2 by the Earth's oceans. Additional emission reduction measures for GHG could include, but are not limited to, compliance with local, State, or federal plans or strategies for GHG reductions, on-site and off-site mitigation, and project design features. Attainment concentration standards for GHGs have not been established by the federal or State government.

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8 U.S. Environmental Protection Agency. *Climate Change Indicators: Atmospheric Concentrations of Greenhouse Gases*. Available at: https://www.epa.gov/climate-indicators/climate-change-indicators-atmospheric-concentrations-greenhouse-gases. Accessed March 2022.

9 U.S. Environmental Protection Agency. *Sources of Greenhouse Gas Emissions*. Available at: https://19january2017snapshot.epa.gov/ghgemissions/sources-greenhouse-gas-emissions_.html. Accessed May 2022.

Global Warming Potential

Global warming potential (GWP) is one type of simplified index (based upon radiative properties) that can be used to estimate the potential future impacts of emissions of various gases. According to the USEPA, the GWP of a gas, or aerosol, to trap heat in the atmosphere is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas." The reference gas for comparison is CO_2. GWP is based on a number of factors, including the heat-absorbing ability of each gas relative to that of CO_2, as well as the decay rate of each gas relative to that of CO_2. The GWP of each gas is determined by comparing the radiative forcing associated with emissions of that gas versus the radiative forcing associated with emissions of the same mass of CO_2, for which the GWP is set at one. Methane gas, for example, is estimated by the USEPA to have a comparative global warming potential 25 times greater than that of CO_2, as shown in Table 4.1-5.

Table 4.1-5
GWPs and Atmospheric Lifetimes of Select GHGs

Gas	Atmospheric Lifetime (years)	GWP (100 year time horizon)
Carbon Dioxide (CO_2)	50-200[1]	1
Methane (CH_4)	12	25
Nitrous Oxide (N_2O)	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC: Tetrafluoromethane (CF_4)	50,000	7,390
PFC: Hexafluoroethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

1. For a given amount of CO_2 emitted, some fraction of the atmospheric increase in concentration is quickly absorbed by the oceans and terrestrial vegetation, some fraction of the atmospheric increase will only slowly decrease over a number of years, and a small portion of the increase will remain for many centuries or more.

Source: U.S. Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019 [Table 1-2]. April 14, 2021

As shown in the table, at the extreme end of the scale, sulfur hexafluoride is estimated to have a comparative GWP 22,800 times that of CO_2. The atmospheric lifetimes of such GHGs are estimated by the USEPA to vary from 50 to 200 years for CO_2, to 50,000 years for CF_4. Longer atmospheric lifetimes allow GHG to buildup in the atmosphere; therefore, longer lifetimes correlate with the GWP of a gas. The common indicator for GHG is expressed in terms of metric tons of CO_2 equivalents ($MTCO_2e$), which is calculated based on the GWP for each pollutant.

Effects of Global Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The Intergovernmental Panel on Climate Change's (IPCC) Climate Change 2021: The Physical Science Basis report indicated that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia.[10] Signs that global climate change has occurred include:

10 Intergovernmental Panel on Climate Change. *Climate Change 2021: The Physical Science Basis Summary for Policymakers*. Available at: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf. Accessed May 2022.

- Warming of the atmosphere and ocean;
- Diminished amounts of snow and ice;
- Rising sea levels; and
- Ocean acidification.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The Office of Environmental Health Hazard Assessment (OEHHA) identified various indicators of climate change in California, which are scientifically based measurements that track trends in various aspects of climate change. Many indicators reveal discernable evidence that climate change is occurring in California and is having significant, measurable impacts in the State. Changes in the State's climate have been observed, including:

- An increase in annual average air temperature with record warmth from 2012 to 2016;
- More frequent extreme heat events;
- More extreme drought;
- A decline in winter chill; and
- An increase in variability of statewide precipitation.

Warming temperatures and changing precipitation patterns have altered California's physical systems—the ocean, lakes, rivers and snowpack—upon which the State depends. Winter snowpack and spring snowmelt runoff from the Sierra Nevada and southern Cascade Mountains provide approximately one-third of the State's annual water supply. Impacts of climate on physical systems have been observed, such as high variability of snow-water content (i.e., amount of water stored in snowpack), decrease in snowmelt runoff, glacier change (loss in area), rise in sea levels, increase in average lake water temperature and coastal ocean temperature, and a decrease in dissolved oxygen in coastal waters. Impacts of climate change on biological systems, including humans, wildlife, and vegetation, have also been observed, including climate change impacts on terrestrial, marine, and freshwater ecosystems.

In the City of Antioch, specifically, the number of extreme heat days (defined as days where temperatures exceed 103.3 F) could reach an average of 36 days per year, as compared to the four days per year that occur now. While California could not see the average annual precipitation changing significantly in the next 50 to 75 years, precipitation could likely be delivered in more intense storms and within a shorter wet season. For example, the 30-year average length of dry spell in the City is 117 days. By the end of the century, the average dry spell could be up to 132 days.[11]

4.1.3 REGULATORY CONTEXT

Air quality and GHG emissions are monitored and regulated through the efforts of various international, federal, State, and local government agencies. Agencies work jointly and individually to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for regulating and improving the air quality within the project area and monitoring or reducing GHG emissions are discussed below.

[11] Cal-Adapt. *Local Climate Change Snapshot for Antioch, California*. Available at: https://cal-adapt.org/tools/local-climate-change-snapshot. Accessed May 2022.

Federal Regulations Related to Air Quality

The following discussion provides a summary of the federal regulations relevant to air quality, organized by pollutant type.

Criteria Pollutants

The FCAA, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The USEPA is responsible for implementing most aspects of the FCAA, including setting NAAQS for major air pollutants; setting hazardous air pollutant standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric ozone protection measures, and enforcement provisions. Under the FCAA, NAAQS are established for the following criteria pollutants: ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for ozone, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for ozone, NO_2, SO_2, PM_{10}, $PM_{2.5}$ are based on statistical calculations over one- to three-year periods, depending on the pollutant. The FCAA requires the USEPA to reassess the NAAQS at least every five years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

Hazardous Air Pollutants/Toxic Air Contaminants

The 1977 FCAA amendments required the USEPA to identify national emission standards for hazardous air pollutants to protect public health and welfare. Hazardous air pollutants include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 FCAA Amendments, which expanded the control program for hazardous air pollutants, 189 substances and chemical families were identified as hazardous air pollutants.

Federal Regulations Related to GHG Emissions

The following are the federal regulations relevant to GHG emissions.

Federal Vehicle Standards

In 2010, President Obama issued a memorandum directing the Department of Transportation, Department of Energy, USEPA, and National Highway Traffic Safety Administration (NHTSA) to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, the USEPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017 through 2025 light-duty vehicles. The proposed standards were projected to achieve emission rates as low as 163 grams of CO_2 per mile by model year 2025 on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if the foregoing emissions level was achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017 through 2021 (77 FR 62624–63200), and NHTSA intended to set standards for model years 2022 through 2025 in future rulemaking.

In August 2016, the USEPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program would have applied to vehicles with model years 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types of sizes of buses and work trucks. The final standards were expected to lower CO_2 emissions by approximately 1.1 billion MT, and reduce oil consumption by up to two billion barrels over the lifetime of the vehicles sold under the program.

In August 2018, the USEPA and NHTSA proposed to amend certain fuel economy and GHG standards for passenger cars and light trucks and establish new, less-stringent standards for model years 2021 through 2026. Compared to maintaining the post-2020 standards that were previously in place, the 2018 proposal would increase U.S. fuel consumption by approximately 0.5 million barrels per day, and would impact the global climate by $3/1000^{th}$ of 1°C by 2100. California and other states stated their intent to challenge federal actions that would delay or eliminate GHG reduction measures, and committed to cooperating with other countries to implement global climate change initiatives.

On September 27, 2019, the USEPA and NHTSA published the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program (84 FR 51,310), which became effective November 26, 2019. The Part One Rule revokes California's authority to set its own GHG emissions standards and set zero-emission-vehicle mandates in California. On March 31, 2020, the USEPA and NHTSA issued the Part Two Rule, which sets CO_2 emissions standards and corporate average fuel economy standards for passenger vehicles and light-duty trucks for model years 2021 through 2026. On January 20, 2021, President Joe Biden issued an Executive Order (EO) on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, which includes review of the Part One Rule by April 2021 and review of the Part Two Rule by July 2021. In response to the Part One Rule, in December 2021, the U.S. Department of Transportation withdrew its portions of the "SAFE I" rule. As a result, states are now allowed to issue their own GHG emissions standards and zero-emissions vehicle mandates.[12] In addition, the Part Two Rule was adopted to revise the existing national GHG emission standards for passenger cars and light trucks through model year 2026. These standards are the strongest vehicle emissions standards ever established for the light-duty vehicle sector and will result in avoiding more than three billion tons of GHG emissions through 2050.[13]

State Regulations Related to Air Quality

The following discussion summarizes applicable State regulations related to air quality, organized by pollutant type. Only the most prominent and applicable California air quality-related legislation is included below; however, an exhaustive list and extensive details of California air quality legislation can be found at the CARB website (http://www.arb.ca.gov/html/lawsregs.htm).

Criteria Air Pollutants

The FCAA delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the

12 National Highway Traffic Safety Administration. *In Removing Major Roadblock to State Action on Emissions Standards, U.S. Department of Transportation Advances Biden-Harris Administration's Climate and Jobs Goals.* Available at: https://www.nhtsa.gov/press-releases/cafe-preemption-final-rule. Accessed March 2022.

13 U.S. Environmental Protection Agency. *Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026*. Available at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-revise-existing-national-ghg-emissions. Accessed March 2022.

California Environmental Protection Agency (CalEPA) in 1991, is responsible for ensuring implementation of the CCAA of 1988, responding to the FCAA, and regulating emissions from motor vehicles and consumer products.

CARB has established CAAQS, which are generally more restrictive than the NAAQS. The CAAQS describe adverse conditions; that is, pollution levels must be below these standards before a basin can attain the standard. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and do not violate the standards more than once each year. The CAAQS for ozone, CO, SO_2 (one-hour and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. The NAAQS and CAAQS are presented in Table 4.1-2.

Hazardous Air Pollutants/Toxic Air Contaminants

The State Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner), and involved definition of a list of TACs. The California TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. The State list of TACs includes the federally-designated hazardous air pollutants. In 1987, the Legislature enacted the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) to address public concern over the release of TACs into the atmosphere. AB 2588 law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hot spots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over five years. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment, and, if specific thresholds are exceeded, the facility operator is required to communicate the results to the public in the form of notices and public meetings.

CARB Air Quality and Land Use Handbook

CARB's Air Quality and Land Use Handbook: A Community Health Perspective (CARB Handbook) addresses the importance of considering health risk issues when siting sensitive land uses, including residential development, in the vicinity of intensive air pollutant emission sources including freeways or high-traffic roads, distribution centers, ports, petroleum refineries, chrome plating operations, dry cleaners, and gasoline dispensing facilities.[14] The CARB Handbook draws upon studies evaluating the health effects of traffic traveling on major interstate highways in metropolitan California centers within Los Angeles (Interstate-405 and Interstate-710), the San Francisco Bay, and San Diego areas. The recommendations identified by CARB, including siting residential uses a minimum distance of 500 feet from freeways or other high-traffic roadways, are consistent with those adopted by the State of California for location of new schools. Specifically, the CARB Handbook recommends, "Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day".[15]

Importantly, the Introduction chapter of the CARB Handbook clarifies that the guidelines are strictly advisory, recognizing that: "[l]and use decisions are a local government responsibility. The Air Resources Board Handbook is advisory, and these recommendations do not establish

14 California Air Resources Board. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005.
15 *Ibid*.

regulatory standards of any kind." CARB recognizes that there may be land use objectives as well as meteorological and other site-specific conditions that need to be considered by a governmental jurisdiction relative to the general recommended setbacks, specifically stating, "[t]hese recommendations are advisory. Land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues".[16]

Diesel Particulate Matter

In 2000, CARB approved a comprehensive diesel risk reduction plan to reduce diesel emissions, including DPM, from new and existing diesel-fueled vehicles and engines. The regulation was anticipated to result in an 80 percent decrease in statewide diesel health risk by 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment program.[17] The aforementioned regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. Several Airborne Toxic Control Measures (ATCMs) exist that reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 California Code of Regulations [CCR] 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

Heavy-Duty Diesel Truck and Bus Regulation

CARB adopted the final Heavy-Duty Truck and Bus Regulation, Title 13, Division 3, Chapter 1, Section 2025, on December 31, 2014, to reduce DPM and NO_X emissions from heavy-duty diesel vehicles. The rule requires nearly all diesel trucks and buses to be compliant with the 2010 model year engine requirement by January 1, 2023. CARB also adopted an ATCM to limit idling of diesel-fueled commercial vehicles on December 12, 2013. The rule requires diesel-fueled vehicles with gross vehicle weights greater than 10,000 pounds to idle no more than five minutes at any location (13 CCR 2485).

California Health and Safety Code Section 41700

Section 41700 of the Health and Safety Code states that a person must not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property. Section 41700 also applies to sources of objectionable odors.

Heavy-Duty Vehicle Idling Emission Reduction Program

On October 20, 2005, CARB approved a regulatory measure to reduce emissions of toxics and criteria pollutants by limiting idling of new and in-use sleeper berth equipped diesel trucks.[18] The regulation established new engine and in-use truck requirements and emission performance requirements for technologies used as alternatives to idling the truck's main engine. For example, the regulation requires 2008 and newer model year heavy-duty diesel engines to be equipped with

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16 *Ibid.*
17 California Code of Regulations, Title 13, Article 4.8, Chapter 9, Section 2449.
18 California Air Resources Board. *Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling*. October 24, 2013.

a non-programmable engine shutdown system that automatically shuts down the engine after five minutes of idling, or optionally meet a stringent NO_X emission standard. The regulation also requires operators of both in-state and out-of-state registered sleeper berth equipped trucks to manually shut down their engine when idling more than five minutes at any location within California. Emission producing alternative technologies such as diesel-fueled auxiliary power systems and fuel-fired heaters are also required to meet emission performance requirements that ensure emissions are not exceeding the emissions of a truck engine operating at idle.

In-Use Off-Road Diesel Vehicle Regulation

On July 26, 2007, CARB adopted a regulation to reduce DPM and NO_X emissions from in-use (existing), off-road, heavy-duty diesel vehicles in California.[19] Such vehicles are used in construction, mining, and industrial operations. The regulation is designed to reduce harmful emissions from vehicles by subjecting fleet owners to retrofit or accelerated replacement/repower requirements, imposing idling limitations on owners, operators, renters, or lessees of off-road diesel vehicles. The idling limits require operators of applicable off-road vehicles (self-propelled diesel-fueled vehicles 25 horsepower and up that were not designed to be driven on-road) to limit idling to less than five minutes. The idling requirements are specified in Title 13 of the CCR.

State Regulations Related to GHG Emissions

The statewide GHG emissions regulatory framework is summarized below. The following text describes EOs, legislation, regulations, and other plans and policies that would directly or indirectly reduce GHG emissions and/or address climate change issues. The following discussion does not include an exhaustive list of applicable regulations; rather, only the most prominent and applicable California legislation related to GHG emissions and climate change is included below.

State Climate Change Targets

California has taken a number of actions to address climate change, including EOs, legislation, and CARB plans and requirements, which are summarized below.

EO S-3-05

EO S-3-05 (June 2005) established California's GHG emissions reduction targets and laid out responsibilities among the State agencies for implementing the EO and for reporting on progress toward the targets. The EO established the following targets:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

EO S-3-05 also directed the CalEPA to report biannually on progress made toward meeting the GHG targets and the impacts to California due to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. The Climate Action Team was formed, which subsequently issued reports from 2006 to 2010.

[19] California Air Resources Board. *In-Use Off-Road Diesel Vehicle Regulation*. December 10, 2014.

AB 32

In furtherance of the goals established in EO S-3-05, the Legislature enacted AB 32 (Núñez and Pavley). The bill is referred to as the California Global Warming Solutions Act of 2006 (September 27, 2006). AB 32 provided initial direction on creating a comprehensive, multi-year program to limit California's GHG emissions at 1990 levels by 2020 and initiate the transformations required to achieve the State's long-range climate objectives. AB 32 also required that the CARB prepare a "scoping plan" for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020. The CARB's Scoping Plan is described in further detail below.

EO B-30-15

EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under EO S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing GHG emissions to 40 percent below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80 percent below 1990 levels by 2050 as set forth in EO S-3-05. To facilitate achieving this goal, EO B-30-15 called for an update to the CARB's Climate Change Scoping Plan: A Framework for Change (Scoping Plan) to express the 2030 target in terms of million metric tons (MMT) CO_2e. The CARB's Scoping Plan is discussed in further detail below. The EO also called for State agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets.

Senate Bill (SB) 32 and AB 197

SB 32 and AB 197 (enacted in 2016) are companion bills. SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, to provide ongoing oversight over implementation of the State's climate policies. AB 197 also added two members of the Legislature to the Board as non-voting members; requires CARB to make available and update (at least annually via the CARB's website) emissions data for GHGs, criteria air pollutants, and TACs from reporting facilities; and requires CARB to identify specific information for GHG emissions reduction measures when updating the Scoping Plan.

CARB's Climate Change Scoping Plan

One specific requirement of AB 32 is for CARB to prepare a scoping plan for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020 (Health and Safety Code Section 38561[a]), and to update the Scoping Plan at least once every five years. In 2008, CARB approved the first Scoping Plan. The Scoping Plan included a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the State's long-range climate objectives. The key elements of the Scoping Plan include the following:

1. Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
2. Achieving a statewide renewable energy mix of 33 percent;
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions;

4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
5. Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (LCFS) (17 CCR, Section 95480 et seq.); and
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

The Scoping Plan also identified local governments as essential partners in achieving California's goals to reduce GHG emissions because they have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Specifically, the Scoping Plan encouraged local governments to adopt a reduction goal for municipal operations and for community emissions to reduce GHGs by approximately 15 percent from 2008 levels by 2020. Many local governments developed community-scale local GHG reduction plans based on this Scoping Plan recommendation.

In 2014, CARB approved the first update to the Scoping Plan. The First Update to the Climate Change Scoping Plan: Building on the Framework (First Update) defined the State's GHG emission reduction priorities for the next five years and laid the groundwork to start the transition to the post-2020 goals set forth in EO S-3-05 and EO B-16-2012. The First Update concluded that California is on track to meet the 2020 target but recommended a 2030 mid-term GHG reduction target be established to ensure a continuation of action to reduce emissions. The First Update recommended a mix of technologies in key economic sectors to reduce emissions through 2050, including energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies. As part of the First Update, CARB recalculated the State's 1990 emissions level using more recent GWPs identified by the IPCC, from 427 MMT CO_2e to 431 MMT CO_2e.

In 2015, as directed by EO B-30-15, CARB began working on an update to the Scoping Plan to incorporate the 2030 target of 40 percent below 1990 levels by 2030 to keep California on a trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80 percent below 1990 levels by 2050, as set forth in EO S-3-05. In summer 2016, the Legislature affirmed the importance of addressing climate change through passage of SB 32 (Pavley, Chapter 249, Statutes of 2016).

In December 2017, the Scoping Plan was once again updated. The 2017 Scoping Plan built upon the successful framework established in the initial Scoping Plan and First Update, while identifying new, technologically feasible and cost-effective strategies that would serve as the framework to achieve the 2030 GHG target as established by SB 32 and define the State's climate change priorities to 2030 and beyond. For local governments, the 2017 Scoping Plan replaced the initial Scoping Plan's 15 percent reduction goal with a recommendation to aim for a community-wide goal of no more than six $MTCO_2e$ per capita by 2030, and no more than two $MTCO_2e$ per capita by 2050, which are consistent with the State's long-term goals. The 2017 Scoping Plan recognized the benefits of local government GHG planning (e.g., through Climate Action Plans [CAPs]) and provided more information regarding tools to support those efforts. The 2017 Scoping Plan also recognized the CEQA streamlining provisions for project-level review where a legally adequate CAP exists.

When discussing project-level GHG emissions reduction actions and thresholds in the context of CEQA, the 2017 Scoping Plan stated that "achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development" for project-level CEQA analysis, but also recognized that such a standard may not be appropriate or feasible for every development project. The 2017 Scoping Plan further provided that "the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA."

The most recent update to the Scoping Plan, the 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan Update) was adopted by the CARB in December 2022.[20] The 2022 Scoping Plan Update builds upon previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. The 2022 Scoping Plan Update, the most comprehensive and far-reaching Scoping Plan developed to date, identifies a technologically feasible and cost-effective path to achieve carbon neutrality by 2045 while also assessing the progress California is making toward reducing its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan. The 2030 target is an interim but important stepping stone along the critical path to the broader goal of deep decarbonization by 2045. The relatively longer path assessed in the Scoping Plan incorporates, coordinates, and leverages many existing and ongoing efforts to reduce GHGs and air pollution, while identifying new clean technologies and energy. Given the focus on carbon neutrality, the Scoping Plan also includes discussion for the first time of the Natural and Working Lands (NWL) sectors as both sources of emissions and carbon sinks.

The 2022 Scoping Plan Update lays out a path to achieve targets for carbon neutrality and reduce GHG emissions by 85 percent below 1990 levels by 2045, as directed by AB 1279. The actions and outcomes in the plan will achieve significant reductions in fossil fuel combustion by deploying clean technologies and fuels, further reductions in short-lived climate pollutants, support for sustainable development, increased action on natural and working lands to reduce emissions and sequester carbon, and the capture and storage of carbon.

CARB's Regulations for the Mandatory Reporting of GHG Emissions

CARB's Regulation for the Mandatory Reporting of GHG Emissions (17 CCR 95100–95157) incorporated by reference certain requirements that the USEPA promulgated in its Final Rule on Mandatory Reporting of GHGs (40 Code of Federal Regulations [CFR] Part 98). In general, entities subject to the Mandatory Reporting Regulation that emit more than 10,000 $MTCO_2e$ per year are required to report annual GHGs through the California Electronic GHG Reporting Tool. Certain sectors, such as refineries and cement plants, are required to report regardless of emission levels. Entities that emit more than the 25,000 $MTCO_2e$ per year threshold are required to have their GHG emission report verified by a CARB-accredited third party.

SB 1383

SB 1383 establishes specific targets for the reduction of SLCPs (40 percent below 2013 levels by 2030 for CH_4 and HFCs, and 50 percent below 2013 levels by 2030 for anthropogenic black carbon), and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, CARB adopted its SLCP Reduction Strategy in March 2017. The SLCP Reduction

[20] California Air Resources Board. *2022 Scoping Plan for Achieving Carbon Neutrality*. November 16, 2022. Available at: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents. Accessed December 2022.

Strategy establishes a framework for the statewide reduction of emissions of black carbon, CH_4, and fluorinated gases.

EO B-55-18/AB 1279

EO B-55-18 (September 2018) establishes a statewide policy for California to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net-negative emissions thereafter. The goal is an addition to the existing statewide targets of reducing the State's GHG emissions. CARB intends to work with relevant State agencies to ensure that future scoping plan updates identify and recommend measures to achieve the carbon neutrality goal. On September 16, 2022, AB 1279, also known as the California Climate Crisis Act, codified the carbon neutrality goal established by EO B-55-18.

Mobile Sources

The following regulations relate to the control of GHG emissions from mobile sources. Mobile sources include both on-road vehicles and off-road equipment.

AB 1493

AB 1493 (Pavley) (July 2002) was enacted in response to the transportation sector accounting for more than half of California's CO_2 emissions. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the State board to be vehicles that are primarily used for non-commercial personal transportation in the State. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. When fully phased in, the near-term (2009–2012) standards would result in a reduction of approximately 22 percent of GHG emissions compared to the emissions from the 2002 fleet, and the mid-term (2013–2016) standards would result in a reduction of approximately 30 percent. In December 2021, the Part Two Rule was adopted to revise the existing national GHG emission standards for passenger cars and light trucks through model year 2026. The standards are the most stringent vehicle emissions standards ever established for the light-duty vehicle sector.[21]

SB 375

SB 375 (Steinberg) (September 2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 requires CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035, and to update those targets every eight years. SB 375 requires the State's 18 regional metropolitan planning organizations to prepare a sustainable communities strategy as part of their Regional Transportation Plans that will achieve the GHG reduction targets set by CARB. If a metropolitan planning organization is unable to devise a sustainable communities strategy to achieve the GHG reduction target, the metropolitan planning organization must prepare an alternative planning strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to California Government Code Section 65080(b)(2)(K), a sustainable communities strategy does not (1) regulate the use of land, (2) supersede the land use authority of cities and

[21] U.S. Environmental Protection Agency. *Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026*. Available at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-revise-existing-national-ghg-emissions. Accessed March 2022.

counties, or (3) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with the sustainable community strategy. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the State-mandated housing element process.

Advanced Clean Cars Program and Zero-Emissions Vehicle Program

The Advanced Clean Cars program (January 2012) is an emissions-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars. To improve air quality, CARB has implemented new emission standards to reduce smog-forming emissions beginning with 2015 model year vehicles. By 2025, implementation of the rule is anticipated to reduce emissions of smog-forming pollution from cars by 75 percent compared to the average new car sold in 2015. To reduce GHG emissions, CARB, in conjunction with the USEPA and NHTSA, adopted GHG standards for model year 2017 to 2025 vehicles; the standards were estimated to reduce GHG emissions by 34 percent by 2025. The zero-emissions vehicle program acts as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of zero-emissions vehicles and plug-in hybrid electric vehicles (EVs) in the 2018 to 2025 model years. However, implementation of the Advanced Clean Cars program is contingent upon the outcome of the ongoing SAFE Vehicles Rule litigation.

EO B-16-12

EO B-16-12 (March 2012) required that State entities under the governor's direction and control support and facilitate the rapid commercialization of zero-emissions vehicles. The order directed CARB, California Energy Commission (CEC), California Public Utilities Commission (CPUC), and other relevant agencies to work with the Plug-In Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to help achieve goals by 2015, 2020, and 2025. On a statewide basis, EO B-16-12 established a target reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels by 2050. EO B-16-12 did not apply to vehicles that have special performance requirements necessary for the protection of the public safety and welfare.

AB 1236

AB 1236 (October 2015) (Chiu) required a city, county, or city and county to approve an application for the installation of electric-vehicle charging stations, as defined, through the issuance of specified permits unless the city or county makes specified written findings based on substantial evidence in the record that the proposed installation would have a specific, adverse impact upon the public health or safety, and a feasible method to satisfactorily mitigate or avoid the specific, adverse impact does not exist. The bill provided for appeal of that decision to the planning commission, as specified. AB 1236 required electric-vehicle charging stations to meet specified standards. The bill required a city, county, or city and county with a population of 200,000 or more residents to adopt an ordinance, by September 30, 2016, that created an expedited and streamlined permitting process for electric-vehicle charging stations. The bill also required a city, county, or city and county with a population of less than 200,000 residents to adopt the ordinance by September 30, 2017.

EO N-79-20

EO N-79-20 (September 2020) establishes a Statewide goal that 100 percent of in-state vehicle sales of new passenger cars and trucks shall be zero-emission by the year 2035. The order directed the CARB to develop and propose passenger vehicle and truck regulations requiring increasing volumes of new zero-emission vehicles sold in the State in order to achieve the goal by 2035. In addition, the order required that a Zero-Emissions Vehicle Market Development Strategy be created and updated every three years to ensure coordinated and expeditious implementation of the EO.

Water

The following regulations relate to the conservation of water, which reduces GHG emissions related to electricity demands from the treatment and transportation of water.

EO B-29-15

In response to a drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25 percent relative to water use in 2013. The term of the EO extended through February 28, 2016, although many of the directives subsequently became permanent water-efficiency standards and requirements. The EO includes specific directives that set strict limits on water usage in the State. In response to EO B-29-15, the California Department of Water Resources modified and adopted a revised version of the Model Water Efficient Landscape Ordinance (MWELO) that, among other changes, significantly increases the requirements for landscape water use efficiency, and broadens the applicability of the ordinance to include new development projects with smaller landscape areas.

Solid Waste

The following regulations relate to the generation of solid waste and means to reduce GHG emissions from solid waste produced within the State.

AB 939 and AB 341

In 1989, AB 939, known as the Integrated Waste Management Act (California Public Resources Code [PRC] Sections 40000 et seq.), was passed because of the observed increase in waste stream and the decrease in landfill capacity.

AB 341 (Chapter 476, Statutes of 2011 [Chesbro]) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that the policy goal of the State is that not less than 75 percent of solid waste generated be source-reduced, recycled, or composted by 2020, and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery to develop strategies to achieve the State's policy goal.

Other State Actions

The following State regulations are broadly related to GHG emissions.

SB 97

SB 97 (Dutton) (August 2007) directed the Governor's Office of Planning and Research to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, the Governor's Office of Planning and Research issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities. The advisory further recommended that the lead agency determine the significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant. The California Natural Resource Agency (CNRA) adopted the CEQA Guidelines amendments in December 2009, and the amended CEQA Guidelines became effective in March 2010.

Under the amended CEQA Guidelines, a lead agency has the discretion to determine whether to use a quantitative or qualitative analysis, or apply performance standards to determine the significance of GHG emissions resulting from a particular project (14 CCR 15064.4[a]). The CEQA Guidelines require a lead agency to consider the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4[b]). The CEQA Guidelines also allow a lead agency to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through the implementation of project features or off-site measures. The adopted amendments do not establish a GHG emission threshold, instead allowing a lead agency to develop, adopt, and apply the lead agency's own thresholds of significance or those developed by other agencies or experts. CNRA acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions.

With respect to GHG emissions, the CEQA Guidelines state that lead agencies should "make a good faith effort, to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions (14 CCR 15064.4[a]). The CEQA Guidelines note that an agency may identify emissions by either selecting a "model or methodology" to quantify the emissions or by relying on "qualitative analysis or other performance based standards" (14 CCR 15064.4[a]). Section 15064.4(b) states that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment: (1) the extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4[b]).

EO S-13-08

EO S-13-08 (November 2008) is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. Therefore, the EO directs State agencies to take specified actions to assess and plan for such impacts. The final 2009 California Climate Adaptation Strategy report was issued in December 2009, and an update, Safeguarding California: Reducing Climate Risk, followed in July 2014. To assess the State's vulnerability, the report summarizes key climate change impacts to the State for the following areas: agriculture, biodiversity and habitat, emergency management, energy, forestry, ocean and coastal ecosystems and resources, public health, transportation, and water. Issuance of the Safeguarding California: Implementation Action Plans followed in March 2016. In January 2018, the CNRA released the Safeguarding California Plan: 2018 Update, which communicates current and needed actions that the State government should take to build climate change resiliency.

Local Regulations

The following are the regulatory agencies and regulations pertinent to the proposed project on a local level.

Plan Bay Area 2050

Plan Bay Area 2050 is a long-range transportation and land use/housing strategy through 2050 for the San Francisco Bay Area, designed to reduce GHG emissions from the mobile sector.[22] The Plan was approved by the MTC and the ABAG on October 21, 2021. The Plan also meets all State and federal requirements for a Regional Transportation Plan and Sustainable Communities Strategy.

Plan Bay Area 2050 provides an outline for growth in four focus areas: Priority Development Areas (PDA); Transit-Rich Areas; Priority Production Areas; and High-Resource Areas. The project site is not located within a PDA. According to the Plan Bay Area 2050 Forecasting and Modeling Appendix, housing in Contra Costa County is projected to increase by 169,000 households, or 44 percent, and jobs are projected to increase by 130,000, or 32 percent.[23]

Local jurisdictions seeking to implement development projects consistent with The Plan are eligible for funding for PDA planning and transportation projects. In addition, jurisdictions have the option to streamline the development process for projects consistent with The Plan and meet the other criteria included in SB 375.

Bay Area Air Quality Management District

The BAAQMD is the public agency entrusted with regulating air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties.

The BAAQMD has prepared CEQA Air Quality Guidelines, which are intended to be used for assistance with CEQA review. The BAAQMD CEQA Air Quality Guidelines include thresholds of significance and project screening levels for criteria air pollutants (ROG, NO_X, PM_{10}, and $PM_{2.5}$), GHGs, TACs, CO, and odors, as well as methods to assess and mitigate project-level and plan-level impacts. The most recent BAAQMD CEQA Air Quality Guidelines were released in April 2023.

Regional Air Quality Plans

As discussed above, the 2001 Ozone Attainment Plan was prepared as a revision to the Bay Area part of the SIP to achieve the federal ozone standard. The plan was adopted on October 24, 2001, approved by the CARB on November 1, 2001, and was submitted to the USEPA on November 30, 2001 for review and approval as a revision to the SIP. In addition, in order to fulfill federal air quality planning requirements, the BAAQMD adopted a $PM_{2.5}$ emissions inventory for the year 2010, which was submitted to the USEPA on January 14, 2013 for inclusion in the SIP.

The most recent State ozone plan is the 2017 Clean Air Plan, adopted on April 19, 2017. The 2017 Clean Air Plan is an update of the most recent Bay Area ozone plan, the 2010 Clean Air Plan, and focuses on two primary goals: protecting public health, and protecting the climate. The 2017 Clean Air Plan includes feasible measures to reduce emissions of ozone precursors, including ROG and NOx. In addition, the 2017 Clean Air Plan builds upon and enhances the BAAQMD's efforts to reduce emissions of fine particulate matter and TACs.[24]

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22 Association of Bay Area Governments and Metropolitan Transportation Commission. *Plan Bay Area 2050: Final.* October 2021.

23 Association of Bay Area Governments and Metropolitan Transportation Commission*. Forecasting and Modeling Report, Appendix 1: Growth Pattern*. October 2021.

24 Bay Area Air Quality Management District. *Final 2017 Clean Air Plan: Spare the Air, Cool the Climate*. April 2017.

Although the CCAA does not require the region to submit a plan for achieving the State PM_{10} standard, the BAAQMD has prioritized measures to reduce PM in developing the control strategy for the 2017 Clean Air Plan. It should be noted that on January 9, 2013, the USEPA issued a final rule to determine that the San Francisco Bay Area has attained the 24-hour $PM_{2.5}$ federal standard, which suspends federal SIP planning requirements for the Bay Area.

The aforementioned applicable air quality plans contain mobile source controls, stationary source controls, and transportation control measures to be implemented in the region to attain the State and federal standards within the SFBAAB. The plans are based on population and employment projections provided by local governments, usually developed as part of the General Plan update process.

Rules and Regulations

All projects under the jurisdiction of the BAAQMD are required to comply with all applicable BAAQMD rules and regulations. Applicable BAAQMD's regulations and rules include, but are not limited to, the following:

- Regulation 2: Permits
  - Rule 5: New Source Review of Toxic Air Contaminates
- Regulation 6: Particulate Matter and Visible Emissions
  - Rule 2: Commercial Cooking Equipment
  - Rule 3: Wood-burning Devices
- Regulation 7: Odorous Substances
- Regulation 8: Organic Compounds
  - Rule 3: Architectural Coatings
- Regulation 11: Hazardous Pollutants
  - Rule 2: Asbestos Demolition, Renovation and Manufacturing

Additionally, all projects within BAAQMD jurisdiction are required to implement the Basic Construction Mitigation Measures (BCMMs), which include the following:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
7. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
8. Unpaved roads providing access to sites located 100 feet or further from a paved road shall be treated with a six- to 12-inch layer of compacted layer of wood chips, mulch, or gravel.
9. Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and

take corrective action within 48 hours. The Air District's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations.

In addition to the BCMMs, projects are strongly encouraged to implement enhanced best management practices to control fugitive dust emissions. The enhanced measures are especially important when schools, residential areas, or other sensitive land uses are located near the construction site. BAAQMD recommended enhanced best management practices include the following:

1. Limit the simultaneous occurrence of excavation, grading, and ground-disturbing construction activities.
2. Install wind breaks (e.g., trees, fences) on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
3. Plant vegetative ground cover (e.g., fast-germinating native grass seed) in disturbed areas as soon as possible and watered appropriately until vegetation is established.
4. Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.
5. Minimize the amount of excavated material or waste materials stored at the site.
6. Hydroseed or apply non-toxic soil stabilizers to construction areas, including previously graded areas, that are inactive for at least 10 calendar days.

City of Antioch General Plan

The following goals and policies related to air quality and GHG emissions are from the City of Antioch General Plan, including policies from Section 4.4.6.7 specific to the Sand Creek Focus Area:

Policy 4.4.6.7.ff. The Sand Creek Focus Area is intended to be "transit-friendly," including appropriate provisions for public transit and nonmotorized forms of transportation.

Objective 10.6.1 Minimize air pollutant emissions within the Antioch Planning Area so as to assist in achieving state and federal air quality standards.

Construction Emissions

Policy 10.6.2.a Require development projects to minimize the generation of particulate emissions during construction through implementation of the dust abatement actions outlined in the CEQA Handbook of the Bay Area Air Quality Management District.

Mobile Emissions

Policy 10.6.2.b Require developers of large residential and non-residential projects to participate in programs and to take measures to improve traffic flow and/or reduce vehicle trips resulting in decreased vehicular emissions. Examples of such efforts may include, but are not limited to the following:

- Development of mixed-use projects, facilitating pedestrian and bicycle transportation and permitting consolidation of vehicular trips.
- Installation of transit improvements and amenities, including dedicated bus turnouts and sufficient rights-of-way for transit movement, bus shelters, and pedestrian easy access to transit.
- Provision of bicycle and pedestrian facilities, including bicycle lanes and pedestrian walkways connecting residential areas with neighborhood commercial centers, recreational facilities, schools, and other public areas.
- Contributions for off-site mitigation for transit use.
- Provision of charging stations for electric vehicles within large employment-generating and retail developments.

Stationary Source Emissions

Policy 10.6.2.f Provide physical separations between (1) proposed new industries having the potential for emitting toxic air contaminants and (2) existing and proposed sensitive receptors (e.g., residential areas, schools, and hospitals).

Policy 10.6.2.g Require new wood burning stoves and fireplaces to comply with EPA and BAAQMD approved standards.

City of Antioch Climate Action Planning

In 2007, the City of Antioch joined the International Council for Local Environmental Initiatives (ICLEI). As a member of the ICLEI, the City drafted and adopted two Climate Action Plans, one for municipal operations and the other for community-wide operations. Both Climate Action Plans provided GHG emissions inventories, with the Municipal Climate Action Plan considering emissions related to the provision of water, wastewater, and solid waste services, as well as assessing emissions related to the City's vehicle fleet, street lights within the City, City facilities, and employee commutes. Concurrently, the Community Climate Action Plan (CCAP) inventoried emissions related to residential energy consumption, industrial energy use, commercial energy use, solid waste, transportation and other mobile sources, solid waste generation, water consumption, and wastewater production. In compliance with AB 32, emissions reduction targets were established for both community and municipal emissions, and two different approaches were implemented to meet the identified targets. The Municipal Climate Action Plan established measures and policies related to each emission source category, which would reduce existing and future emission from the identified sources. Simultaneously, the CCAP included GHG reduction strategies related to land use and transportation, green building and energy, and education and behavior change.

Although the CCAP does not include quantitative thresholds to assess a project's compliance with the CCAP, projects that are in compliance with AB 32 would be considered compliant with the CCAP. For instance, project's showing emissions reductions as required by AB 32, or projects incorporating reduction strategies from the CCAP are understood to be in compliance with the CCAP's GHG emissions reductions goals.

In May of 2020, the City adopted a Climate Action and Resilience Plan (CARP). The CARP is a five-year plan that includes action items intended to build community resilience, sustainability, and equity. Implementation of the proposed actions outlined in the CARP would reduce the community's reliance on carbon-based energy sources, and the CARP aligns with the statewide goals established by AB 32 and SB 32. Neither the CCAP nor CARP meet the criteria for a qualified CAP under State CEQA Guidelines Section 15183.5(b).

4.1.4 IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology used to analyze and determine the proposed project's potential impacts related to air quality and GHG emissions. A discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

Based on the recommendations of BAAQMD, City of Antioch standards, and consistent with Appendix G of the CEQA Guidelines, the proposed project would result in a significant impact related to air quality and GHG emissions if the project would result in any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations (including localized CO concentrations and TAC emissions);
- Result in other emissions (such as those leading to odors) affecting a substantial number of people;
- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

Pursuant to CEQA Guidelines Section 15064.4(b)(2), the lead agency is charged with determining a threshold of significance that is applicable to the project. For the analysis within this EIR, the City has elected to use the BAAQMD's thresholds of significance. The air quality and GHG emissions analysis in this EIR uses the thresholds for criteria pollutants, localized CO, TAC emissions, and GHG emissions as discussed below.

Criteria Pollutant Emissions

The BAAQMD thresholds of significance for ozone precursor and PM emissions are presented in Table 4.1-6 and are expressed in pounds per day (lbs/day) for construction and operational average daily emissions and tons per year (tons/year) for maximum annual operational emissions.

Table 4.1-6 BAAQMD Thresholds of Significance			
	Construction	Operational	
Pollutant	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROG	54	54	10
NO_X	54	54	10
PM_{10} (exhaust)	82	82	15
$PM_{2.5}$ (exhaust)	54	54	10
Source: BAAQMD, CEQA Air Quality Guidelines, April 2023.			

Emissions of particulate matter can be split into two categories: fugitive emissions and exhaust emissions. The BAAQMD thresholds of significance for exhaust PM emissions are presented in Table 4.1-6. The BAAQMD does not maintain quantitative thresholds for fugitive emissions of PM_{10} or $PM_{2.5}$; rather, BAAQMD requires all projects within the district's jurisdiction to implement BCMMs related to dust suppression.

Localized CO Emissions

If a project would cause localized CO emissions to exceed the 1-hour and 8-hour CAAQS of 20.0 ppm and 9.0 ppm, respectively, BAAQMD would consider the project to result in a significant impact to air quality. In order to provide a conservative indication of whether a project would result in localized CO emissions that would exceed the applicable threshold of significance, the BAAQMD has established screening criteria for localized CO emissions. According to BAAQMD, a project would result in a less-than-significant impact related to localized CO emission concentrations if the following screening criteria are met:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans;
- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; and
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, underpass, etc.).

TAC Emissions

According to BAAQMD, a significant impact related to TACs would occur if a new source would cause any of the following:

- An increase in cancer risk levels of more than 10 persons in one million;
- A non-cancer (chronic or acute) hazard index greater than 1.0; or
- An annual average $PM_{2.5}$ concentration of 0.3 micrograms per cubic meter ($\mu g/m^3$) or greater.

An impact associated with TACs would also occur if the aggregate total of all past, present, and foreseeable future sources within a 1,000-foot radius from the fence line of a source, or from the location of a receptor, plus the contribution from the project, would exceed the following:

- An increase in cancer risk levels (from all local sources) of more than 100 persons in one million;
- A chronic non-cancer hazard index (from all local sources) greater than 10.0; or
- An annual average $PM_{2.5}$ concentration (from all local sources) of 0.8 μg/m^3 or greater.

The foregoing risk thresholds are intended for use in analyzing potential impacts related to the siting of a new source of emissions. The proposed project involves development of the project site for residential and commercial uses. The proposed uses are not anticipated to involve any substantial stationary sources of TACs. Thus, the BAAQMD thresholds presented above would not directly apply to the proposed uses.

GHG Emissions

As noted previously, in April 2023 the BAAQMD adopted updated CEQA Air Quality Guidelines. The updated guidelines include qualitative GHG thresholds, which consist of two distinct categories of criteria that must be met: Buildings and Transportation.

The BAAQMD's Buildings criteria require that a project must meet the following minimum project design elements:

a. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development).
b. The project will not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines.

The BAAQMD's Transportation criteria require that a project must meet the following:

a. Achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted Senate Bill 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA:
    i. Residential projects: 15 percent below the existing VMT per capita;
    ii. Office projects: 15 percent below the existing VMT per employee; or
    iii. Retail projects: no net increase in existing VMT.
b. Achieve compliance with off-street EV requirements in the most recently adopted version of CALGreen Tier 2.

Alternatively, a project is not required to implement the foregoing design elements if the project shows consistency with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b).

Method of Analysis

A comparison of project-related emissions to the thresholds discussed above shall determine the significance of the potential impacts to air quality and climate change resulting from the proposed project. Emissions attributable to the proposed project which exceed the significance thresholds could have a significant effect on regional air quality and the attainment of the federal and State AAQS. Where potentially significant air quality impacts are identified, mitigation measures are described that would reduce or eliminate the impact.

Construction Emissions

The proposed project's short-term construction emissions were estimated using the CalEEMod version 2020.4.0, which is a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify air quality emissions from land use projects. The model applies inherent default values for various land uses, including trip generation rates based on the Institute of Transportation Engineers (ITE) Manual, vehicle mix, trip length, average speed, etc. However, where project-specific data was available, such data was input into the model. The following inherent design features and project-specific information were included in the model:

- Construction would begin in April of 2024;
- Construction would occur over approximately 3.5 years;
- 300,000 cubic yards (CY) of net soil export would be required to level the site;
- Wood-burning hearths would not be included in the proposed project;
- The proposed project would include a water conservation strategy sufficient to reduce indoor and outdoor water use by 10 percent each; and
- Trip generation rates were adjusted based on the information included in the Transportation Impact Assessment prepared by Fehr and Peers for the proposed project.[25]

The results of emissions estimations were compared to the standards of significance discussed above in order to determine the associated level of impact. Results of the modeling are expressed in lbs/day for criteria air pollutant emissions and $MTCO_2e$/yr for GHG emissions, which allows for comparison between the model results and the thresholds of significance. All CalEEMod modeling results are included in Appendix E to this EIR. It is noted that the estimated construction GHG emissions are presented for disclosure purposes only, as the BAAQMD does not have a threshold of significance for construction GHG emissions.

Operational Emissions

The proposed project's operational emissions were estimated using CalEEMod. The modeling performed for the proposed project included compliance with BAAQMD rules and regulations (i.e., low-volatile organic compound [VOC] paints and low-VOC cleaning supplies), as well as with the 2019 California Building Standards Code (CBSC). All buildings constructed after January 1, 2020 within California are required to comply with the mandatory standards within the 2019 CBSC. Compliance with the 2019 CBSC would be verified as part of the City's building approval review process. Provisions within the 2019 CBSC include energy efficiency requirements for residential and non-residential structures, as well as the requirement that all new residential structures of three or fewer stories be constructed with renewable energy systems sufficient to meet 100 percent of the structure's electricity demand.

The results of emissions estimations were compared to the standards of significance discussed above in order to determine the associated level of impact. Results of the modeling are expressed in lbs/day for project-level emissions, tons/yr for cumulative emissions, and $MTCO_2e$/yr for GHG emissions, which allows for comparison between the model results and the thresholds of significance. All CalEEMod modeling results are included in Appendix E to this EIR. Like construction GHG emissions, the estimated operational GHG emissions are presented for

25 Fehr and Peers. *Transportation Impact Assessment, Albers Ranch*. July 2022.

disclosure purposes only, as the BAAQMD's applicable thresholds of significance for operational GHG emissions are qualitative only.

Project-Specific Impacts and Mitigation Measures

Global climate change is, by nature, a cumulative impact. Emissions of GHG contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change (e.g., sea level rise, impacts to water supply and water quality, public health impacts, impacts to ecosystems, impacts to agriculture, and other environmental impacts). While GHG emissions from a project in combination with other past, present, and future projects contribute to the world-wide phenomenon of global climate change and the associated environmental impacts, a single project could not generate enough GHG emissions to contribute noticeably to a change in the global average temperature. Because the effects of GHG emissions are cumulative by nature, separate discussions for project-level and cumulative-level impacts for the proposed project are not necessary for this chapter of the EIR, and all analysis of GHG impacts is presented within the cumulative impact discussions of this chapter.

However, potential impacts related to air quality may occur on both a project-level and a cumulative basis. Accordingly, both a project-level and a cumulative analysis of potential air quality-related impacts are presented below.

4.1-1 Conflict with or obstruct implementation of the applicable air quality plan during project construction. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

During construction of the project, various types of equipment and vehicles would temporarily operate on the project site. Construction-related emissions would be generated from construction equipment, vegetation clearing and earth movement activities, construction workers' commute, and construction material hauling for the entire construction period. The aforementioned activities would involve the use of diesel- and gasoline-powered equipment that would generate emissions of criteria pollutants. Project construction activities also represent sources of fugitive dust, which includes $PM_{2.5}$ emissions. As construction of the proposed project would generate emissions of criteria air pollutants, including ROG, NO_X, PM_{10}, and $PM_{2.5}$ intermittently within the site and in the vicinity of the site, until all construction has been completed, construction is a potential concern, as the proposed project is located in a nonattainment area for ozone and PM.

The proposed project is required to comply with all BAAQMD rules and regulations including Regulation 8, Rule 3 related to architectural coatings. In addition, all projects under the jurisdiction of the BAAQMD are recommended to implement all of the BCMMs provided in the BAAQMD CEQA Air Quality Guidelines. Although BAAQMD recommends that all construction activity within the SFBAAB implement the above listed BCMMs, the proposed project was modeled without the inclusion of such measures to provide a conservative, worst-case emissions scenario. Even under the conservative assumptions used for this analysis, emissions of $PM_{2.5}$ and PM_{10} would remain below the BAAQMD's thresholds of significance.

Using CalEEMod, the maximum construction-related emissions were estimated for development of the proposed project and are presented in Table 4.1-7. As presented in Table 4.1-7, implementation of the proposed project would result in construction-related exhaust emissions of ROG, PM_{10}, and $PM_{2.5}$ below the applicable thresholds of significance. However, construction-related emissions of NO_X would exceed the applicable thresholds of significance.

Table 4.1-7
Maximum Unmitigated Construction Emissions (lbs/day)

Pollutant	Proposed Project Emissions	Threshold of Significance	Exceeds Threshold?
ROG	15.96	54	**NO**
NO_x	75.63	54	**YES**
PM_{10}*	1.68	82	**NO**
$PM_{2.5}$*	1.56	54	**NO**

Note:
* Denotes emissions from exhaust only. BAAQMD does not have adopted PM thresholds for fugitive emissions.

Source: CalEEMod, May 2022 (see Appendix E).

Therefore, construction of the proposed project could significantly contribute to the region's nonattainment status for ozone or PM and obstruct implementation of an applicable air quality plan, and a ***significant*** impact associated with construction-related emissions would occur.

Mitigation Measure(s)

The primary source of project-related construction NO_X emissions would be associated with off-road construction equipment. Implementation of Mitigation Measure 4.1-1, which requires the use of higher-tier off-road equipment, would reduce the emissions of NO_X to below the applicable BAAQMD threshold of significance, as presented in Table 4.1-8. Therefore, implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

Table 4.1-8
Maximum Mitigated Construction Emissions (lbs/day)

Pollutant	Proposed Project Emissions	Threshold of Significance	Exceeds Threshold?
ROG	15.96	54	**NO**
NO_x	51.38	54	**NO**
PM_{10}*	0.69	82	**NO**
$PM_{2.5}$*	0.66	54	**NO**

Note:
* Denotes emissions from exhaust only. BAAQMD does not have adopted PM thresholds for fugitive emissions.

Source: CalEEMod, May 2022 (see Appendix E).

4.1-1 Prior to approval of any grading plans, the project applicant shall show on the plans via notation that the contractor shall ensure that the heavy-duty off-road vehicles (50 horsepower or more) to be used in the construction *project, including owned, leased, and subcontractor vehicles, shall achieve a project wide fleet average 28.6 percent NO_X reduction compared to the year 2024 California Air Resources Board (CARB) fleet average. The 28.6 percent NO_X reduction may be achieved by requiring a combination of engine Tier 3 or Tier 4 off-road construction equipment or the use of hybrid, electric, or alternatively fueled equipment. For instance, the emissions presented in Table 4.1-8 were achieved by requiring graders, scrapers, and rubber-tired dozers to be engine Tier 4.*

In addition, all off-road equipment operating at the construction site must be maintained in proper working condition according to manufacturer's specifications. Idling shall be limited to five minutes or less in accordance with the In-Use Off-Road Diesel Vehicle Regulation as required by CARB. Clear signage regarding idling restrictions shall be placed at the entrances to the construction site.

Portable equipment over 50 horsepower must have either a valid BAAQMD Permit to Operate (PTO) or a valid statewide Portable Equipment Registration Program (PERP) placard and sticker issued by CARB.

Conformance with the foregoing requirements shall be included as notes and be confirmed through review and approval of grading plans by the City of Antioch Community Development Department.

4.1-2 Conflict with or obstruct implementation of the applicable air quality plan during project operation. Based on the analysis below, the impact is *less than significant*.

Operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ would be generated by the proposed project from both mobile and stationary sources. The use of fireplaces/hearths would make up the majority of project-related emissions under unmitigated operations of the proposed project. Emissions would also occur from area sources such as landscape maintenance equipment exhaust and consumer products (e.g., deodorants, cleaning products, spray paint, etc.).

Operational emissions resulting from development of the project were modeled in CalEEMod, and the results are presented in Table 4.1-9. The various assumptions included in the modeling are discussed in the Method of Analysis section above. As demonstrated in Table 4.1-9, operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ would be below the BAAQMD's thresholds of significance. Thus, implementation of the proposed project would not generate long-term operational criteria air pollutant emissions in excess of thresholds, and the project would not contribute to the region's nonattainment status of ozone and/or violate an air quality standard. Accordingly, the project would not be considered to conflict with or obstruct implementation of regional air quality plans during project operation, and a ***less-than-significant*** impact would occur.

Table 4.1-9 Maximum Unmitigated Operational Emissions					
	Proposed Project Emissions		Threshold of Significance		
Pollutant	lbs/day	tons/yr	lbs/day	tons/yr	Exceeds Threshold?
ROG	30.68	5.18	54	10	**NO**
NO_X	17.95	2.27	54	10	**NO**
PM_{10}*	0.92	0.08	82	15	**NO**
$PM_{2.5}$*	0.91	0.08	54	10	**NO**

Note:
* Denotes emissions from exhaust only. BAAQMD has not yet adopted PM thresholds for fugitive emissions.

Source: CalEEMod, May 2022 (see Appendix E).

Mitigation Measure(s)
None required.

4.1-3 Expose sensitive receptors to substantial pollutant concentrations. Based on the analysis below, the impact is *less than significant*.

The major pollutant concentrations of concern are localized CO emissions, TAC emissions, and criteria pollutant emissions, which are addressed in further detail below.

Localized CO Emissions
Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. Concentrations of CO approaching the AAQS are only expected where background levels are high, and traffic volumes and congestion levels are high. Implementation of the proposed project would increase traffic volumes on streets near the project site; therefore, the project would be expected to increase local CO concentrations.

The statewide CO Protocol document identifies signalized intersections operating at level of service (LOS) E or F, or projects that would result in the worsening of signalized intersections to LOS E or F, as having the potential to result in localized CO concentrations in excess of AAQS, as a result of large numbers of cars idling at stop lights.[26] In order to provide a conservative indication of whether a project would result in localized CO emissions that would exceed the applicable threshold of significance, the BAAQMD has established screening criteria for determining whether the effect that a project would have on any given intersection would cause a potential CO hotspot. According to BAAQMD, a project would result in a less-than-significant impact related to localized CO emission concentrations if all of the following conditions are true for the project:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated

[26] University of California, Davis. *Transportation Project-Level Carbon Monoxide Protocol*. December 1997.

roads or highways, regional transportation plan, and local congestion management agency plans;

- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; and
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, underpass, etc.).

While BAAQMD has established the foregoing screening criteria for potential impacts, it should be noted that the SFBAAB has been in attainment of CAAQS and NAAQS for CO for more than 20 years.[27] Due to the continued attainment of CAAQS and NAAQS, and advances in vehicle emissions technologies, the likelihood that any single project would create a CO hotspot is minimal. The Contra Costa Transportation Authority (CCTA) is the applicable Congestion Management Agency for the proposed project. As discussed in Chapter 4.2, Transportation, the City will require conditions of approval sufficient to ensure that the proposed project's increase in traffic levels in the vicinity would not cause a conflict with applicable CCTA standards.

Based on data provided in the Transportation Impact Assessment prepared for the proposed project,[28] the maximum traffic volume anticipated at any affected intersection would not reach 44,000 vehicles per hour. In addition, development of the proposed project would not result in the increase of traffic volumes beyond 24,000 vehicles per hour at any intersections where vertical and/or horizontal mixing is substantially limited. Therefore, based on the BAAQMD's screening criteria for localized CO emissions, the project would not be expected to result in substantial levels of localized CO at surrounding intersections or generate localized concentrations of CO that would exceed standards or cause health hazards.

TAC Emissions

Another category of environmental concern is TACs. The CARB's Air Quality and Land Use Handbook: A Community Health Perspective (Handbook) provides recommendations for siting new sensitive land uses near sources typically associated with significant levels of TAC emissions, including, but not limited to, freeways and high traffic roads, distribution centers, and rail yards.[29] The CARB has identified DPM from diesel-fueled engines as a TAC; thus, high-volume roadways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. Health risks from TACs are a function of both the concentration of emissions and the duration of exposure.

The proposed project would include construction activity within the project site that would involve the use of off-road equipment, much of which would likely be diesel powered. The potential for construction activity to generate DPM emissions is dependent on the number and types of equipment implemented for construction activity. Off-road heavy-duty diesel equipment used for site grading, paving, utility trenching and other construction activities result in the generation of DPM.

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27 Bay Area Air Quality Management District. *Air Quality Summary Reports*. Available at: http://www.baaqmd.gov/about-air-quality/air-quality-summaries. Accessed May 2022.

28 Fehr and Peers. *Transportation Impact Assessmen, Albers Ranch* [pg. 32]. July 2022.

29 California Air Resources Board. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005.

The nearest sensitive receptors to the project site are the rural residences located to the west, across Deer Valley Road, with the closest located approximately 90 feet away. Although the receptors are located in relatively close proximity to the project site boundary, the overall project site is approximately 96.5 acres, and only approximately 47.4 acres would ultimately be disturbed by the proposed development. In addition, off-road construction equipment would operate at various locations throughout the development area over the construction period. The assisted living/neighborhood commercial component of the proposed project would be located in the western three acres of the project site. However, development of the western three acres would be minimal in comparison to the 31.2-acre area that would be developed with single-family residences. Accordingly, the majority of the development would occur on the eastern portion of the site. Construction equipment operating within the eastern portions of the site would be up to 3,900 feet away from the nearest receptors. The distance between the sensitive receptors to the west and the primary development area on the eastern portion of the project site would allow for substantial dispersion of DPM from construction equipment prior to reaching the nearest sensitive receptors. Furthermore, the prevailing wind direction in the City of Antioch is most often from the west. Thus, emissions generated from construction equipment would most often blow eastward, away from the nearest sensitive receptors.

Methodologies for conducting health risk assessments are associated with long-term exposure periods (e.g., over a 30-year lifetime). However, construction activity associated with implementation of the proposed project would occur over an approximately 3.5-year period. While overall construction activity would occur over approximately 3.5 years, construction of any phase of the project would occur over an even shorter period of time. During the construction period, construction activity would only occur during the days and hours specified in Section 5-17.05 of the City's Municipal Code, and required by Mitigation Measure XIII-1 of the Initial Study prepared for the proposed project. Limitation of construction activity to certain hours would ensure that emissions only occur intermittently throughout the course of a day, as opposed to emissions being generated constantly throughout an entire day. In addition, off-road construction equipment would operate at various locations throughout the development area of the project site intermittently. Thus, considering the large development area, varying distance between the construction area and the nearest receptor, and intermittent nature of operation of construction equipment, any one individual receptor would not be exposed to high concentrations of DPM from construction activity consistently throughout the 3.5-year construction period.

Furthermore, all construction equipment and operation thereof would be regulated per CARB's In-Use Off-Road Diesel Vehicle Regulation. The In-Use Off-Road Diesel Vehicle Regulation includes emissions reducing requirements such as limitations on vehicle idling, disclosure, reporting, and labeling requirements for existing vehicles, as well as standards relating to fleet average emissions and the use of Best Available Control Technologies.

Considering the above, emissions from construction equipment would be dispersed throughout the project site, would occur over a relatively limited amount of time, would occur intermittently throughout the day and construction period, and all construction equipment would be required to comply with the CARB's rules and regulations related to emissions control. Accordingly, construction would not be expected to expose sensitive receptors to substantial concentrations of TACs.

Residential development, including the future assisted living component, and neighborhood commercial uses do not typically involve operations that would be considered to result in substantial TAC emissions. While not anticipated, should the neighborhood commercial component require an emergency generator, or other stationary source of TAC emissions, a permit to operate such a stationary source would be required from BAAQMD.

Based on the above, the proposed project is not anticipated to result in the exposure of nearby sensitive receptors to substantial concentrations of TACs during project construction or operations.

Criteria Pollutants

As discussed in the Existing Environmental Setting section and summarized in Table 4.1-1, criteria pollutant emissions can cause negative health effects. With regard to the proposed project, the principal criteria pollutants of concern are localized CO, ozone, and PM. As discussed above, the proposed project is not anticipated to result in impacts related to localized exposure of sensitive receptors to substantial concentrations of CO. Unlike CO and many TACs, due to atmospheric chemistry and dynamics, ozone and atmospheric PM typically act to impact public health on a cumulative and regional level, rather than a localized level. Due to the cumulative and regional nature of effects from criteria pollutants, the analysis of potential health effects of criteria pollutants is further discussed in Impact 4.1-5.

Conclusion

As discussed above, the proposed project would not cause any substantial levels of localized CO concentrations or other TACs. Construction-related emissions would be temporary, intermittent throughout the day, spread over the project site, and regulated. Thus, the proposed project would be expected to result in a ***less-than-significant*** impact associated with exposure of sensitive receptors to substantial levels of pollutant concentrations.

Mitigation Measure(s)

None required.

4.1-4 Result in other emissions (such as those leading to odors) affecting a substantial number of people. Based on the analysis below, the impact is *less than significant*.

Pollutants of principal concern include emissions leading to odors, emission of dust, or emissions considered to constitute air pollutants. Air pollutants have been discussed in Impacts 4.1-1 through 4.1-3 above. Therefore, the following discussion focuses on emissions of odors and dust.

Odors

According to the BAAQMD's CEQA Air Quality Guidelines, the ability to detect odors varies considerably among the population and can be subjective.[30] Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The presence of an odor impact is dependent on a number of variables including: the nature of the odor source; the frequency of odor generation; the intensity of odor; the distance of odor source to sensitive receptors; wind direction; and sensitivity of the receptor.

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, quantitative analysis to determine the presence of a significant odor impact is difficult. Typical odor-generating land uses include, but are not limited to, wastewater treatment plants, landfills, and composting facilities. The proposed project would not introduce any such land uses and is not located in the vicinity of any such existing or planned land uses.

Construction activities often include diesel fueled equipment and heavy-duty trucks, which could create odors associated with diesel fumes that may be considered objectionable. However, construction activities would be temporary, and operation of construction equipment would be restricted to the allowable hours established in Section 5-17.05 of the City's Municipal Code, and as required by Mitigation Measure XII-1 of the Initial Study prepared for the proposed project. In order to revise a typographical error in the Initial Study and ensure consistency with the City's Municipal Code and General Plan, Mitigation Measure XII-1 has been revised as follows:

XII-1. *Prior to approval of grading permits, the City shall establish the following requirements, via written notation on final improvement plans, subject to review and approval by the City of Antioch Community Development Department:*

- *Construction activities shall be limited to the hours of ~~8:00 AM and 5:00 PM~~ <u>7:00 AM and 6:00 PM</u> Monday through Friday, <u>and 9:00 AM and 5:00 PM on weekends</u> ~~when work is within 300 feet of occupied dwellings, and to between the hours of 7:00 AM and 7:00 PM Monday through Friday when work occurs greater than 300 feet from occupied dwellings. Such activities should be limited to the hours of 9:00 AM and 5:00 PM on Saturdays. No construction shall be allowed on Sundays and public holidays~~.*
- *The construction contractor shall use temporary noise attenuation fences to protect sensitive receptors west of the project site.*
- *The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.*
- *Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust*

30 Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines* [pg. 5-16]. April 2023.

mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.

- *When not in use, motorized construction equipment shall not be left idling for more than five minutes.*
- *Stationary equipment (power generators, compressors, etc.) shall be located at the furthest practical distance from nearby noise-sensitive land uses or sufficiently shielded to reduce noise-related impacts.*

Furthermore, considering the large development area, construction equipment would operate at various locations throughout the project site intermittently, and the distances from the nearest sensitive receptors would allow for dispersal of diesel odors. Project construction would also be required to comply with all applicable BAAQMD rules and regulations, particularly associated with permitting of air pollutant sources. The aforementioned regulations would help to minimize air pollutant emissions, as well as any associated odors. Accordingly, substantial objectionable odors would not be expected to occur during construction activities.

It should be noted that BAAQMD regulates objectionable odors through Regulation 7, Odorous Substances, which does not become applicable until the Air Pollution Control Officer (APCO) receives odor complaints from ten or more complainants within a 90-day period. Once effective, Regulation 7 places general limitation on odorous substances and specific emission limitations on certain odorous compounds, which remain effective until such time that citizen complaints have been received by the APCO for one year. The limits of Regulation 7 become applicable again when the APCO receives odor complaints from five or more complainants within a 90-day period. Thus, although not anticipated, if odor complaints are made after the proposed project is developed, the BAAQMD would ensure that such odors are addressed, and any potential odor effects reduced to less than significant.

Dust

As noted previously, all projects under the jurisdiction of BAAQMD are required to implement the BAAQMD's BCMMs, including, but not limited to, the following measures that specifically relate to dust suppression:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

The aforementioned measures would ensure that construction of the proposed project does not result in substantial emissions of dust. Following project construction, the development area would be paved or landscaped and would not include any exposed topsoil. Thus, project operations would not generate significant amounts of dust that would adversely affect a substantial number of people.

Conclusion

For the aforementioned reasons, construction and operation of the proposed project would not result in emissions (such as those leading to odors) adversely affecting a substantial number of people, and a ***less-than-significant*** impact would result.

Mitigation Measure(s)

None required.

Cumulative Impacts and Mitigation Measures

As defined in Section 15355 of the CEQA Guidelines, "cumulative impacts" refers to two or more individual effects which, when considered together, are considerable, compound, or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.

A project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects. The geographic context for the cumulative air quality analysis includes Contra Costa County and surrounding areas within the portion of the SFBAAB that is designated nonattainment for ozone and PM_{10}.

As discussed previously, climate change occurs on a global scale, and emissions of GHGs, even from a single project, contribute to the global impact. However, due to the existing regulations within the State, for the purposes of this analysis, the geographic context for the analysis of GHG emissions presented in this EIR is the State of California.

4.1-5 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). Based on the analysis below, the project's incremental contribution to this significant cumulative impact is *less than cumulatively considerable.*

Buildout of the proposed project would lead to the release of emissions that would contribute to the cumulative regional air quality setting. The following section includes a discussion of the proposed project's cumulative contribution to construction emissions in concert with other local proposed projects, the cumulative operational emissions associated with implementation of the project, and the cumulative health effects of exposure to criteria pollutants.

Cumulative Construction Emissions from the Proposed Project

Construction activities result in one-time, relatively short-term emissions, and typically are not considered to contribute to cumulative emissions. However, when several large-scale construction projects occur within the same timeframe and within the same geographic region, the construction emissions may contribute to a cumulative impact.

The City of Antioch is currently processing applications for several development projects in the vicinity of the project site, including The Ranch Project. Additionally, several projects in the project area have either been approved but have not yet initiated development, or are currently under construction. Within the City of Antioch, the area to the north of the site was previously approved for development with the Aviano Project, and the area to the northeast of the site was previously approved for development with the Promenade/Vineyards at Sand Creek Project. Both projects are currently under construction. The area to the east is approved for development for the Creekside/Vineyards at Sand Creek Project. The Ranch Project site is located to the west, across Deer Valley Road. The proposed developments in the vicinity of the project site would include development of low- and medium-density residences, public facilities, commercial and retail buildings, public parks, and open space areas. Construction of the proposed project could potentially overlap with a combination of the foregoing projects. However, it is noted that the proposed project would include connections to the proposed utility lines and roadways within the Aviano and Creekside/Vineyards at Sand Creek projects and, thus, is not likely to be built prior to the other adjacent developments.

The construction schedule for each project is unknown at this time. In addition, should the proposed project be approved, construction may not occur immediately following approval. Given the many variables dictating construction timing, the likelihood that construction activities for all of the aforementioned projects would occur simultaneously is low, and timing of construction of each project is speculative. Pursuant to Section 15145 of the CEQA Guidelines, CEQA does not require evaluation of speculative impacts, and, given the above, the potential overlap of the construction periods is considered speculative. Furthermore, all projects include mitigation measures to reduce construction-related emissions to below the BAAQMD's thresholds of significance.[31,32,33,34] Therefore, each individual project would independently fall below the applicable thresholds and, consistent with BAAQMD's guidance, would be considered to have a less-than-significant contribution to the emissions of criteria pollutants during construction.

Ultimately, overlap of the construction of projects in the greater project vicinity could contribute to the cumulatively significant impacts related to air quality in the SFBAAB. However, because emissions related to construction of the proposed project are below thresholds, the project's incremental contribution to this cumulatively significant impact is less than cumulatively considerable.

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31 City of Antioch. *The Ranch Project Draft Environmental Impact Report, State Clearinghouse Number 2019060012*. March 20, 2020.

32 City of Antioch. *Vineyards at Sand Creek Environmental Impact Report, SCH#2014092010*. June 2015.

33 City of Antioch. *Creekside/Vineyards at Sand Creek Project Environmental Impact Report, SCH# 2020039044*. June 2015.

34 City of Antioch. *Aviano Adult Community Project Environmental Impact Report, State Clearinghouse #2006072027*. November 2008.

Cumulative Operational Emissions from the Proposed Project

The long-term emissions associated with operation of the proposed project in conjunction with other existing or planned development in the area would incrementally contribute to impacts to the region's air quality. According to the BAAQMD's CEQA Air Quality Guidelines, if a project were to exceed the identified significance thresholds, the project's emissions would be cumulatively considerable.[35] Operational emissions resulting from development of the project were discussed under Impact 4.1-2, the results are presented in Table 4.1-9. As shown in the table, the proposed project's operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ would be below the applicable BAAQMD thresholds of significance. Therefore, the project's contribution to cumulative emissions of criteria pollutants would be less than cumulatively considerable.

Cumulative Health Effects of Criteria Pollutants

As noted in Table 4.1-1, exposure to criteria air pollutants can result in adverse health effects. The AAQS presented in Table 4.1-2 are health-based standards designed to ensure safe levels of criteria pollutants that avoid specific adverse health effects. Because the SFBAAB is designated as nonattainment for State and federal eight-hour ozone and State PM_{10} standards, the BAAQMD, along with other air districts in the SFBAAB region, has adopted federal and state attainment plans to demonstrate progress towards attainment of the AAQS. Full implementation of the attainment plans would ensure that the AAQS are attained and sensitive receptors within the SFBAAB are not exposed to excess concentrations of criteria pollutants. The BAAQMD's thresholds of significance were established with consideration given to the health-based air quality standards established by the AAQS, and are designed to aid the district in implementing the applicable attainment plans to achieve attainment of the AAQS.[36] Thus, if a project's criteria pollutant emissions exceed the BAAQMD's emission thresholds of significance, a project would be considered to conflict with or obstruct implementation of the BAAQMD's air quality planning efforts, thereby delaying attainment of the AAQS. Because the AAQSs are representative of safe levels that avoid specific adverse health effects, a project's hinderance of attainment of the AAQS could be considered to contribute towards regional health effects associated with the existing nonattainment status of ozone and PM_{10} standards.

However, as discussed in Impact 4.1-1 and 4.1-2, and following implementation of Mitigation Measure 4.1-1, the proposed project would not result in exceedance of the applicable BAAQMD thresholds of significance. Consequently, implementation of the proposed project would not conflict with the BAAQMD's adopted attainment plans nor would the proposed project inhibit attainment of regional AAQS. Therefore, implementation of the proposed project would not contribute towards regional health effects associated with the existing nonattainment status of ozone and PM_{10} standards.

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35 Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines* [pg. 5-4]. April 2023.

36 Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines* [pg. 5-10]. April 2023.

Conclusion

Based on the above, the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant emissions for which the region is in nonattainment under an applicable federal and State AAQS. As such, the proposed project's incremental contribution to regional air quality impacts would be ***less than cumulatively considerable***.

Mitigation Measure(s)

None required.

4.1-6 Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Based on the analysis below and with implementation of mitigation, the project's incremental contribution to this significant cumulative impact is *cumulatively considerable* and *significant and unavoidable*.

An individual project's GHG emissions are at a micro-scale level relative to global emissions and effects to global climate change; however, an individual project could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. As such, impacts related to emissions of GHG are inherently considered cumulative impacts.

Implementation of the proposed project would cumulatively contribute to increases of GHG emissions that are associated with global climate change. Estimated GHG emissions attributable to future development would be primarily associated with increases of CO_2 and, to a lesser extent, other GHG pollutants, such as CH_4 and N_2O. Sources of GHG emissions include area sources, mobile sources or vehicles, utilities (electricity and natural gas), water usage, wastewater generation, and the generation of solid waste.

Based on the modeling conducted for the proposed project, construction of the project was estimated to generate maximum unmitigated GHG emissions of 1,593.42 $MTCO_2e$/yr. The total unmitigated annual operational GHG emissions for the first year of project operation (assumed to be 2027) were estimated as presented in Table 4.1-10.

As noted previously, the applicable BAAQMD thresholds of significance for GHG emissions are qualitative, and the foregoing information is provided for disclosure purposes only. Potential impacts related to GHG emissions resulting from implementation of the proposed project are considered in comparison with BAAQMD's adopted thresholds of significance below.

Table 4.1-10
Unmitigated Project Operational GHG Emissions

Source	Annual GHG Emissions ($MTCO_2e/yr$)
Area	37.24
Energy	813.97
Mobile	3,036.39
Waste	271.08
Water	60.21
Total Annual Operational GHG Emissions	**4,218.99**
GHG Emissions per Capita	**3.92 $MTCO_2e$/yr/capita**

Note: GHG Emissions per Capita = 4,218.99 $MTCO_2e$/yr / 1,079 residents.

Source: CalEEMod, April 2020 (see Appendix E).

BAAQMD Thresholds of Significance

According to the BAAQMD thresholds of significance, a project must either include specific project design elements related to buildings and transportation or be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b).

As discussed above, the City of Antioch has prepared guiding documents that relate to reducing GHG emissions, including the CCAP and CARP. While such documents include GHG reduction goals and recommended sustainability strategies, neither the CCAP nor CARP meet the criteria for a qualified CAP under State CEQA Guidelines Section 15183.5(b). Thus, this discussion evaluates project consistency with the BAAQMD's Buildings and Transportation criteria.

With regard to Buildings criterion a., the project applicant has not yet committed to the prohibition of natural gas infrastructure in the proposed project design. Thus, without mitigation, the proposed project could conflict with Buildings criterion a.

Consistency with Buildings criterion b. was evaluated in Section VI, Energy, of the Initial Study prepared for the proposed project (refer to Appendix A of this EIR). As noted therein, the temporary increase in energy use occurring during construction of the proposed project would not result in a significant increase in peak or base demands or require additional capacity from local or regional energy supplies. During project operations, the proposed project would be required to comply with all applicable regulations related to energy conservation and fuel efficiency, including the Building Energy Efficiency Standards and the CALGreen Code, which would ensure that building energy use associated with the proposed project would not be wasteful, inefficient, or unnecessary. As a result, the proposed project would comply with Buildings criterion b.

Consistency with Transportation criterion c. is evaluated in Chapter 4.2, Transportation, of this EIR. As presented therein, the proposed project would generate VMT per resident that exceeds 15 percent below the existing VMT per capita. Therefore, without mitigation, the proposed project could conflict with Transportation criterion c.

With regard to Transportation criterion d., the 2019 CALGreen Code requires all single-family, townhomes, and duplexes be EV capable (i.e., each dwelling unit must have a listed raceway to accommodate a dedicated 208/40-volt branch circuit), which would be suitable for EV charging. For single-family residences and townhouses, compliance with the 2019 CALGreen Code would satisfy the requirements established by BAAQMD criterion d. Thus, the proposed project would comply with Transportation criterion d.

Conclusion

Based on the above, the proposed project would comply with Buildings criterion b., related to the wasteful, inefficient, or unnecessary use of energy and Transportation criterion d., related to the provision of EV charging stations. However, the proposed project has the potential to conflict with Buildings criterion a., related to the prohibition of natural gas, and Transportation criterion c., related to VMT. Because the proposed project could conflict with the BAAQMD's applicable thresholds of significance for GHG emissions, the proposed project could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Thus, a ***cumulatively considerable*** and ***significant*** impact related to GHG emissions could occur.

Mitigation Measure(s)

Implementation of Mitigation Measure 4.1-6(a) would ensure project consistency with Buildings criterion a. and Mitigation Measure 4.1-6(b) would address Transportation criterion c. As discussed further in Chapter 4.2, Transportation, of this EIR, implementation of the measures required by Mitigation Measure 4.1-6(b) would reduce project VMT, but not to a level that would achieve 15 percent less than the regional average VMT. Therefore, even with the implementation of Mitigation Measure 4.1-6(b), the project would not comply with BAAQMD's Transportation criterion c. Consequently, even with implementation of the following mitigation measures, the project's incremental contribution to the cumulatively significant effects of GHG emissions and global climate change would remain *cumulatively considerable* and *significant and unavoidable*.

4.1-6(a) *Prior to the approval of project improvement plans, the applicant shall implement the following measure:*

- *Consistent with the BAAQMD's Buildings standard a., natural gas shall be prohibited in proposed structures.*

Compliance with the foregoing measure shall be ensured by the City of Antioch Community Development Department.

4.1-6(b) *Implement Mitigation Measures 4.2-3(a) and 4.2-3(b).*

4.2 Transportation

4.2 TRANSPORTATION

4.2.1 INTRODUCTION

The Transportation chapter of the EIR discusses the existing transportation facilities within the project vicinity, as well as applicable policies and guidelines used to evaluate operation of such facilities. Where development of the proposed project would conflict with applicable policies or guidelines, mitigation measures are identified. The information contained within this chapter is primarily based on the Transportation Impact Assessment (TIA) prepared for the proposed project by Fehr & Peers,[1] as well as the City of Antioch General Plan[2] and associated EIR.[3] All technical calculations are included as an appendix to the TIA, which is included as Appendix F to this EIR.

At the beginning of 2019, updated California Environmental Quality Act (CEQA) Guidelines went into effect. The updated CEQA Guidelines require lead agencies such as the City of Antioch to transition from using "level of service" (LOS) to "Vehicle Miles Traveled" (VMT) as the metric for assessing transportation impacts under CEQA (see Section 15064.3). The State's requirement to transition from LOS to VMT is aimed at promoting infill development, public health through active transportation, and a reduction in greenhouse gas (GHG) emissions. Pursuant to CEQA Guidelines, any project that did not initiate CEQA public review prior to July 1, 2020 must use VMT rather than LOS as the metric to analyze transportation impacts. However, LOS remains an important metric used by the City for the purpose of determining consistency with General Plan goals and policies. Although no longer used for determining significant impacts under CEQA, this chapter includes an analysis of the proposed project's effects on LOS in the project vicinity for informational purposes for the City to determine General Plan consistency. Accordingly, the TIA prepared for the proposed project includes both a LOS and VMT analysis.

4.2.2 EXISTING ENVIRONMENTAL SETTING

The section below describes the physical and operational characteristics of the existing transportation system within the study area, including the surrounding roadway network, transit, bicycle, and pedestrian facilities.

Existing Roadways

The following sections provide a summary of the existing roadways within the project area.

State Route 4

State Route (SR) 4 is an east-west freeway that extends from Hercules in the west to Stockton and beyond in the east. In the study area, SR 4 has an east/west orientation from west of SR 160 and a northwest/southeast orientation between SR 160 and Walnut Boulevard in eastern Contra Costa County. The facility is an eight-lane freeway in the west to State Route 160, a six-lane freeway from SR 160 to Laurel Road and a four-lane freeway from Laurel Road to Balfour Road. At Balfour Road, it transitions to a two-lane highway with at-grade intersections at Marsh Creek Road, and beyond. Each ramp-terminal intersection is signalized and operated by the California

1 Fehr & Peers. *Transportation Impact Assessment, Albers Ranch.* July 2022.
2 City of Antioch. *City of Antioch General Plan*. Updated November 24, 2003.
3 City of Antioch. *Draft General Plan Update Environmental Impact Report*. July 2003.

Department of Transportation (Caltrans). The Contra Costa County Transportation Authority (CCTA) designates SR 4 as a Route of Regional Significance. Routes of Regional Significance are roadways that connect two or more subareas of Contra Costa County, cross County boundaries, carry significant through traffic, and/or provide access to a regional highway or transit facility.

Deer Valley Road

Deer Valley Road is a north-south roadway connecting Brentwood to Antioch. From Balfour Road north to the Sand Creek Focus Area, the road is a two-lane rural roadway with adjacent areas mostly undeveloped and agricultural ranchettes. Along the rural section there are no bicycle or pedestrian facilities, or paved shoulders. North of Sand Creek Road at Kaiser Medical Center, Deer Valley Road has been improved to provide two-travel lanes in the northbound direction, sidewalks, and Class II bicycle facilities on the east side of the roadway; a shoulder has been added to the southbound travel lane. At Mammoth Way, Deer Valley Road provides two travel lanes in each direction, Class II bicycle lanes and sidewalks. North of Sand Creek Road, a center median allows for the provision of left-turn pockets at intersections. Deer Valley has a posted speed limit of 45 miles per hour (mph) and is a CCTA designated Route of Regional Significance.

Sand Creek Road

Sand Creek Road is a four-lane, east-west roadway that extends east from SR 4 through Brentwood. The posted speed limit is 45 mph. On-street parking is not permitted on Sand Creek Road. Class II bicycle lanes and sidewalks are provided along most of the roadway through Brentwood. Sand Creek Road from Brentwood Boulevard to its current terminus at SR 4 is a Route of Regional Significance. Sand Creek Road is ultimately planned to be extended west of SR 4 to Deer Valley Road. When constructed, the future extension of Sand Creek Road to Deer Valley Road would also be a designated Route of Regional Significance. Currently, portions of the planned Sand Creek Road extension have been constructed within the City of Antioch; however, connection to Deer Valley Road has not yet been completed.

Hillcrest Avenue

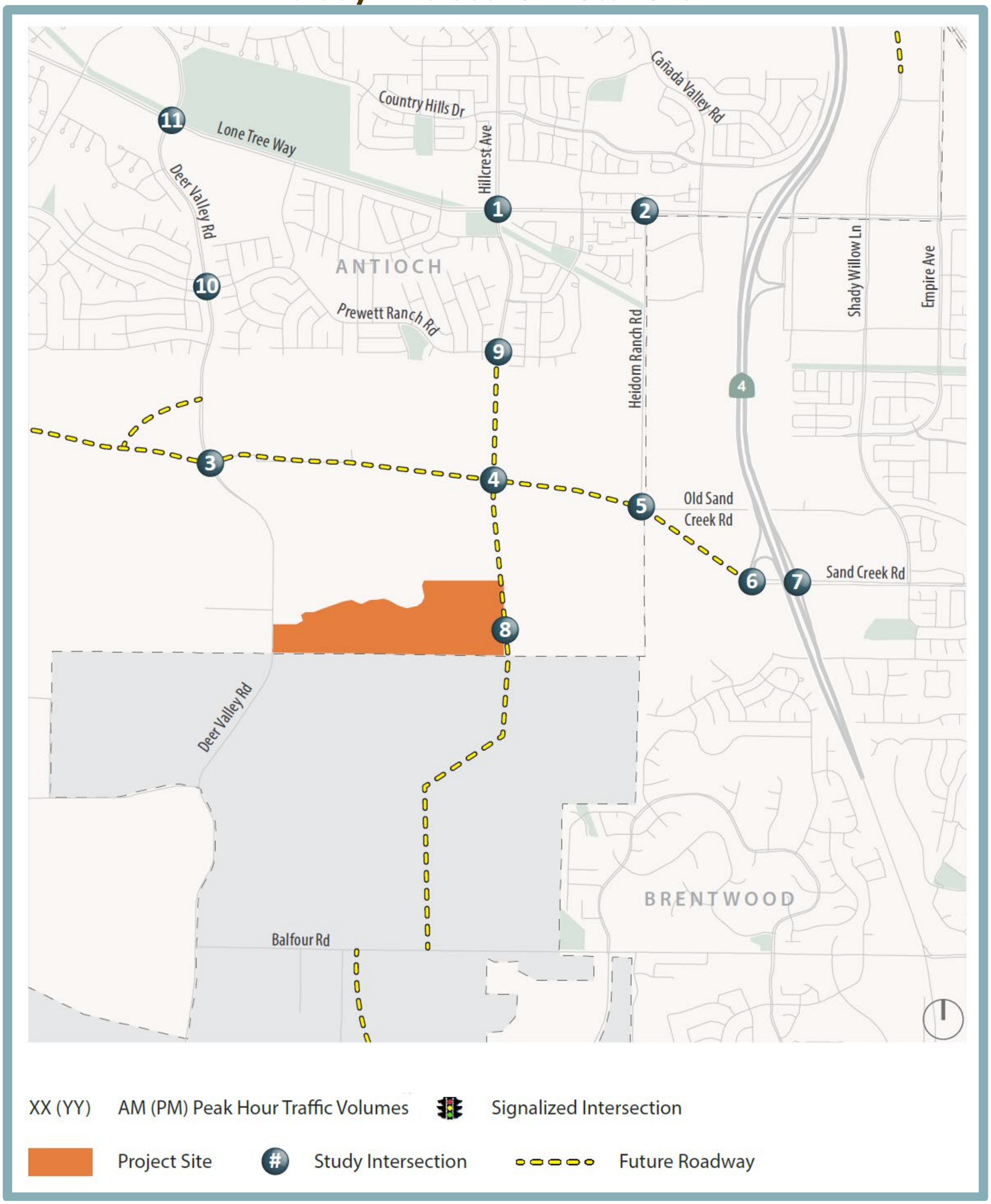
Hillcrest Avenue is a four-lane, north-south roadway that extends north of San Marino Drive/Borden Ranch Lane in the project study area. South of San Marino Drive/Borden Ranch Lane, the roadway becomes Sand Creek Road. The posted speed limit is 45 mph. Hillcrest Avenue provides a connection of the project area to SR 4. Sidewalks and bicycle facilities are provided along the full length of Hillcrest Avenue from north of San Marino Drive/Borden Ranch Lane. Hillcrest Avenue, north of Lone Tree Way, is a designated Route of Regional Significance.

Study Intersections and Freeway Segments

The following intersections were selected for analysis in the TIA based on the project location, estimates of project-generated traffic, and locations of planned roadways in the project vicinity (see Figure 4.2-1):

1. Lone Tree Way at Hillcrest Avenue
2. Lone Tree Way at Heidorn Ranch Road/Fairside Way
3. Sand Creek Road at Deer Valley Road
4. Sand Creek Road at Hillcrest Avenue (Future Intersection)
5. Sand Creek Road at Heidorn Ranch Road (Future Intersection)
6. Sand Creek Road at SR 4 Eastbound Ramps
7. Sand Creek Road at SR 4 Westbound Ramps

Figure 4.2-1
Study Intersection Locations



Source: Fehr & Peers, 2022.

8. Hillcrest Avenue at Project Access (Future Intersection)
9. Hillcrest Avenue at Prewett Ranch Drive
10. Deer Valley Road at Prewett Ranch Drive
11. Deer Valley Road at Lone Tree Way

In addition, the following freeway segments were evaluated in the TIA:

1. SR 4, north of Lone Tree Way, between Laurel Road and Lone Tree Way
2. SR 4, north of Sand Creek Road, between Lone Tree Way and Sand Creek Road
3. SR 4, north of Balfour Road, between Sand Creek Road and Balfour Road
4. SR 4, south of Balfour Road, between Balfour Road and Marsh Creek Road

Common Traffic Analysis Terms

Pursuant to the CEQA Guidelines, VMT is the primary metric used to identify transportation impacts under CEQA. VMT is a measure of the total amount of vehicle travel occurring on a given roadway system. VMT is the product of the total number of vehicles traveling and the number of miles traveled per vehicle.

As discussed in further detail below, while local jurisdictions may no longer rely on vehicle LOS and similar measures related to delay as the basis for determining the significance of transportation impacts under CEQA, the City considers LOS a matter of General Plan policy consistency. Thus, this chapter includes an LOS analysis to support the City's determination regarding project consistency with General Plan goals and policies related to LOS. The operations of roadway facilities are described with the term LOS, a qualitative description of traffic flow from a vehicle driver's perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (free-flow conditions) to LOS F (over capacity conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result and operations are designated LOS F.

Table 4.2-1 and Table 4.2-2 summarize the relationship between delay and LOS for signalized and unsignalized intersections. The delay ranges for unsignalized intersections are lower than for signalized intersections, as drivers expect less delay at unsignalized intersections.

Roadway segments are evaluated by comparing daily traffic volumes on the roadway without and with the project. For residential streets, the maximum desired level of vehicle traffic is 1,500 vehicles per day (VPD). For residential collector streets with front-on housing, the maximum desired level of traffic is 3,000 VPD. For residential collectors without front-on housing, the maximum desired level of traffic is 10,000 VPD. For roadway segments that already exceed the desired threshold, the percent increase in traffic from a project is compared to the typical daily fluctuations in traffic volume, calculated using weekday traffic counts collected on each roadway segment.

For freeway segments, the CCTA 2017 East County Action Plan for Routes of Regional Significance has established the delay index as the Multimodal Transportation Service Objective (MTSO) for SR 4 through the study area. The delay index is the ratio of travel time on a facility divided by the travel times that occur during non-congested free-flow periods. Should the delay index exceed 2.5 during either the AM or PM peak period, freeway operations would be considered deficient. A delay index of 2.5 would equate to peak hour travel taking 2.5 times as long as off-peak travel, or an average travel speed below 26 mph assuming a non-congested free-flow speed of 65 mph.

Table 4.2-1
Signalized Intersection LOS Definitions

LOS	Description of Operations	Average Delay (seconds per vehicle)
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10 to 20
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20 to 35
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35 to 55
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55 to 80
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below	> 80

Source: Fehr & Peers, 2022.

Table 4.2-2
Unsignalized Intersection LOS Definitions

LOS	Description of Operations	Average Delay (seconds per vehicle)
A	Little or no delays	≤ 0 to 10
B	Short traffic delays	> 10 to 15
C	Average traffic delays	> 15 to 25
D	Long traffic delays	> 25 to 35
E	Very long traffic delays	> 35 to 50
F	Extreme traffic, delays where intersection capacity exceeded	> 50

Source: Fehr & Peers, 2022.

Intersection LOS – Existing Conditions

Weekday morning (6:00 to 9:00 AM) and evening (4:00 to 7:00 PM) peak period intersection turning movement counts were collected at the study intersections, including separate counts of pedestrians and bicyclists, in January 2019 with area schools in normal session. Traffic counts at all intersections, with the exception of the Deer Valley Road at Prewett Ranch Drive intersection were collected in January, May, and August 2019 with area schools in normal session (prior to the onset of the Covid-19 pandemic). At the Deer Valley Road at Prewett Ranch Drive intersection, traffic count data from 2017 was incorporated. Counts from 2017 and 2019 were compared and found to be similar. Nevertheless, the 2017 data was increased by two percent to reflect that some traffic changes may have occurred.

Figure 4.2-2 presents the existing lane configurations at the study intersections, as well as the observed peak hour traffic volumes at each study intersection. The study intersection LOS results are summarized in Table 4.2-3 for the AM and PM peak hours. As shown in the table, all study intersections currently operate acceptably based on the applicable City of Antioch and CCTA LOS standards.

It should be noted that Intersections #4, #5, and #8 would be constructed as part of the proposed project and, thus, are not included in the existing roadway network.

Table 4.2-3
Intersection LOS – Existing Conditions

Intersection	Control[1]	Peak Hour	Delay[2]	LOS
1. Lone Tree Way at Hillcrest Avenue	Signal	AM PM	18 21	B C
2. Lone Tree Way at Heidorn Ranch Road/Fairside Way	Signal	AM PM	11 12	B B
3. Sand Creek Road at Deer Valley Road	Signal	AM PM	10 6	A A
4. Sand Creek Road at Hillcrest Avenue (Future Intersection)	Signal	AM PM	-- --	-- --
5. Sand Creek Road at Heidorn Ranch Road (Future Intersection)	Signal	AM PM	-- --	-- --
6. Sand Creek Road at SR 4 Eastbound Ramps	Signal	AM PM	9 8	A A
7. Sand Creek Road at SR 4 Westbound Ramps	Signal	AM PM	5 5	A A
8. Hillcrest Avenue at Project Access (Future Intersection)	SSSC	AM PM	-- --	-- --
9. Hillcrest Avenue at Prewett Ranch Drive	Signal	AM PM	19 17	B B
10. Deer Valley Road at Prewett Ranch Drive	Signal	AM PM	27 14	C B
11. Deer Valley Road at Lone Tree Way	Signal	AM PM	30 21	C C

Notes:
1 Signal = Signalized intersection; SSSC = Side-street stop-controlled intersections; traffic on main street does not stop while traffic on the side-street is controlled by a stop sign.
2 Average intersection delay is calculated for all signalized intersections using the HCM 6th method for vehicles.

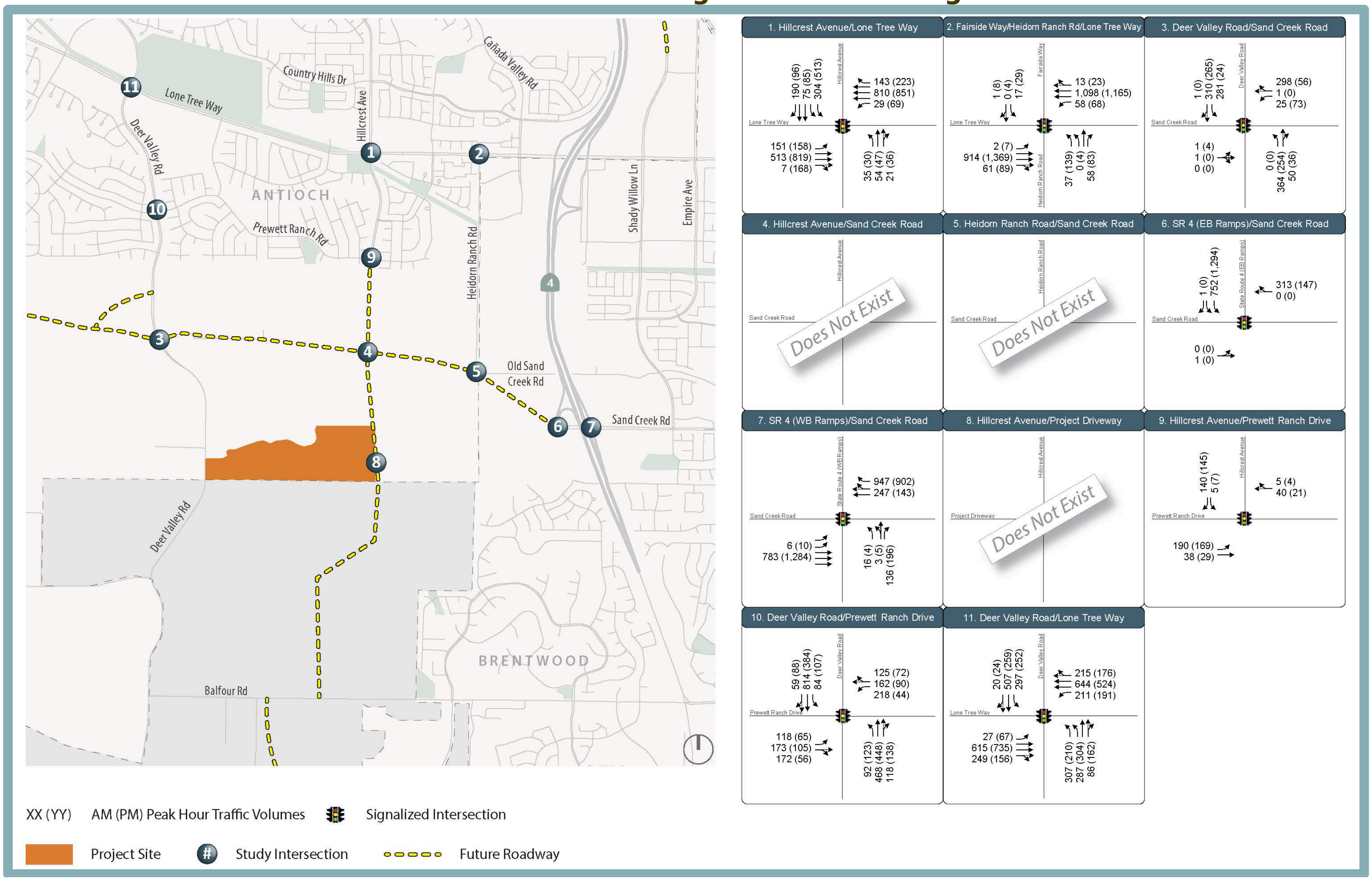
Source: Fehr & Peers, 2022.

Freeway Operations – Existing Conditions

Mainline traffic counts were conducted on SR 4 south of Balfour Road in January 2019. Traffic volumes at the interchanges along the corridor were then used to estimate traffic volumes on the mainline segments from south of Balfour Road to north of Lone Tree Way.

The traffic volumes and number of travel lanes were used to calculate vehicle speeds using the HCM 2010 method, which were then used to calculate the delay index. The results were verified through travel time runs of the corridor during peak hours.

Figure 4.2-2
Traffic Volumes and Lane Configurations: Existing Conditions



Source: Fehr & Peers, 2022.

The existing AM and PM peak hour freeway operations are summarized in Table 4.2-4 below. As shown in the table, SR 4 north of Sand Creek Road operates at free-flow speeds during both the morning and evening peak hours. With the recent widening of SR 4 between Balfour Road and Sand Creek Road, and construction of an interchange, all mainline study freeway segments operate within the established service objective (i.e., delay index of 2.5 or less for the peak hours).

Table 4.2-4
Freeway LOS – Existing Conditions

Segment	Direction	Volume	Delay Index
AM Peak Hour			
1. SR 4, north of Lone Tree Way	NB	2,787	1.01
	SB	2,887	1.01
2. SR 4, north of Sand Creek Road	NB	2,448	1.00
	SB	2,815	1.01
3. SR 4, north of Balfour Road	NB	2,009	1.00
	SB	2,014	1.00
4. SR 4, south of Balfour Road	NB	1,201	1.20
	SB	940	1.03
PM Peak Hour			
1. SR 4, north of Lone Tree Way	NB	3,711	1.11
	SB	2,975	1.02
2. SR 4, north of Sand Creek Road	NB	3,185	1.03
	SB	2,932	1.02
3. SR 4, north of Balfour Road	NB	2,038	1.00
	SB	2,220	1.00
4. SR 4, south of Balfour Road	NB	1,015	1.05
	SB	1,431	1.82

Source: Fehr & Peers, 2022.

Transit Services and Facilities

The Eastern Contra Costa Transit Authority (Tri Delta Transit) provides transit service in eastern Contra Costa County, serving the communities of Brentwood, Antioch, Oakley, Concord, Discovery Bay, Bay Point, and Pittsburg. Three routes operate in the vicinity of the project site, with Routes 379, 388, and 392 stopping at the Kaiser Medical Center on Deer Valley Road, approximately one mile northwest of the project site. Route 388 also has stops on Dallas Ranch Road and Prewett Ranch Drive.

Route 388 operates weekdays between 5:30 AM and 11:30 PM on one-hour headways, connecting the Pittsburg/Bay Point Bay Area Rapid Transit (BART) station and Kaiser Medical Center, while also serving the Sutter Delta Medical Center, Downtown Antioch, Antioch BART, Pittsburg Center BART, the Pittsburg Civic Center, and numerous schools. In the project area, Route 388 operates on Dallas Ranch Road, Prewett Ranch Drive and Deer Valley Road. Route 392 provides weekend service to the same general destinations as Route 388 on one-hour headways between 7:25 AM and 1:44 AM. Route 379 provides weekday service with one morning (7:05 AM) bus from the Antioch BART station to Kaiser Medical Center, and one afternoon bus (3:05 PM) from the Kaiser Medical Center to Antioch BART.

In addition to the regular transit service to the project area, dial-a-ride door-to-door service within Eastern Contra Costa County is provided by Tri Delta Transit for disabled people of all ages and senior citizens. A microtransit pilot program (Tri MyRide) was launched in June 2019 to provide on-demand rideshare service within specific boundaries connecting riders to key destinations, include the Antioch BART station and key shopping destinations. The service area boundaries for Tri MyRide are SR 4, Long Tree Way, and Deer Valley Road.

BART provides fixed rail transit to Eastern Contra Costa County. Currently, the terminus station is located in Antioch at the Hillcrest Avenue interchange, approximately four miles from the project site. Weekday service is provided on approximately 15-minute headways and weekend service is provided on approximately 20-minute headways. The Antioch Line connects to key regional employment centers, including Concord, Pleasant Hill, Walnut Creek, Oakland, and San Francisco. Transfers to other lines can be made in Oakland.

Bicycle and Pedestrian Facilities

Bicycle paths, bike lanes, bike routes, and separated bikeways are typical examples of bicycle transportation facilities, which are defined by Caltrans as follows:

- **Bike paths (Class I)** – Paved trails that are separated from roadways. Such trails are also shared with pedestrians.
- **Bike lanes (Class II)** – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs.
- **Bike routes (Class III)** – Roadways designated for bicycle use by signs only; may or may not include additional pavement width for cyclists.
- **Separated Bikeway (Class IV)** – Separated bikeways, also referred to as cycle tracks or protected bikeways, are bikeways for the exclusive use of bicycles which are physically separated from vehicle traffic. Separated bikeways were adopted by Caltrans in 2015. Types of separation may include, but are not limited to, grade separation, flexible posts, physical barriers, or on-street parking.

In the immediate project vicinity, portions of Deer Valley Road and Dallas Ranch Road provide Class II bicycle facilities with separated lanes designated for bicycle travel. Lone Tree Way from East Tregallas Road to the eastern Lone Tree Way/SR 4 interchange provides Class II or Class III bicycle facilities, with Class III accommodations (pavement marking only, shared with vehicle travel lane) being the predominant bicycle facility. The Class I Mokelumne Trail is located north of the project site, with a grade separated crossing proposed at SR 4, connecting to the existing trail section in Brentwood. The Mokelumne Trail ultimately connects to the Pittsburg/Bay Point BART Station. Numerous existing Class I trails exist within the Dallas Ranch and Prewett Ranch neighborhoods connecting residential neighborhoods to parks and schools.

Pedestrian facilities in the project area include sidewalks, crosswalks, pedestrian signals, and multi-use trails. Many of the recently constructed roadways in the project area generally provide sidewalks on both sides of the street. Notable exceptions are Deer Valley Road south of Sand Creek Road and Balfour Road west of American Avenue, which do not currently provide sidewalks. Pedestrian and bicycle infrastructure currently does not exist on site. At the signalized intersections in the area, crosswalks and pedestrian push-button actuated signals are generally provided.

Vehicle Miles Travelled

In 2013, Senate Bill (SB) 743 was passed to amend Sections 65088.1 and 65088.4 of the Government Code, amend Sections 21181, 21183, 21186, 21187, 21189.1, and 21189.3 of the Public Resources Code (PRC), to add Section 21155.4 to the PRC, to add Chapter 2.7

(commencing with Section 21099) to Division 13 of the PRC, to add and repeal Section 21168.6.6 of the PRC, and to repeal and add Section 21185 of the PRC, relating to environmental quality. As a result of SB 743, as discussed in further detail below, local jurisdictions may no longer rely on vehicle LOS and similar measures related to delay as the basis for determining the significance of transportation impacts under CEQA. Thus, consistent with the CEQA Guidelines, VMT is the primary metric used to identify transportation impacts to roadway systems within this chapter.

The existing baseline average daily home-based VMT per resident and home-work VMT per employee for the City of Antioch, Contra Costa County, and the Bay Area are presented in Table 4.2-5 and Table 4.2-6, respectively. As shown in the table, home based trips in Antioch and Contra Costa County are slightly higher than the Bay Area average; however, home-work trips in Antioch and Contra Costa County are slightly lower than the Bay Area Average.

Table 4.2-5
Existing Average Daily VMT per Resident

Land Use Type	City of Antioch	Contra Costa County	Bay Area
Home-Based VMT	21.1	16.1	12.7
Source: Fehr & Peers, 2022.			

Table 4.2-6
Existing Average Daily VMT per Employee

Land Use Type	City of Antioch	Contra Costa County	Bay Area
Home-Work VMT	12.1	15.2	15.8
Source: Fehr & Peers, 2022.			

4.2.3 REGULATORY CONTEXT

Existing State and local transportation policies, laws, and regulations that would apply to the proposed project are summarized below and provide a context for the impact discussion related to the project's consistency with the applicable regulatory conditions. Federal plans, policies, regulations, or laws related to transportation and circulation are not directly applicable to the proposed project.

State Regulations

The following are the transportation-related regulatory agencies and regulations pertinent to the proposed project at the State level.

California Department of Transportation

Caltrans is responsible for planning, designing, constructing, operating, and maintaining all State-owned roadways. Federal highway standards are implemented in California by Caltrans. Any improvements or modifications to the State highway system within the County or City need to be approved by Caltrans. The County or City does not have the ability to unilaterally make improvements to the State highway system. The Caltrans Traffic Analysis Framework and Focused Transportation Impact Study Guide outlines when a VMT impact study is needed and what should be included in the scope of the study. SR 4 is the facility within the project vicinity that is under the oversight of Caltrans.

Senate Bill 743

In response to SB 743, the Office of Planning and Research (OPR) has updated the CEQA Guidelines to include new transportation-related evaluation metrics for determining the significance of transportation impacts of projects within transit priority areas (TPAs) and allows OPR to extend use of the metric beyond TPAs. In response, OPR released the Technical Advisory on Evaluating Transportation Impacts in CEQA, which identified VMT as the preferred transportation impact metric. OPR applied their discretion to require the use of VMT statewide. SB 743 requires that as of April 27, 2019, vehicle LOS and similar measures related to delay shall not be used as the sole basis for determining the significance of transportation impacts. Determination of impacts based on VMT is required Statewide as of July 1, 2020.

CEQA Guidelines Section 15064.3

Section 15064.3 of the CEQA Guidelines was added in 2018 to address the requirements of SB 743 and the OPR's Technical Advisory on Evaluating Transportation Impacts in CEQA. Section 15064.3 states the following:

(a) Purpose.

This section describes specific considerations for evaluating a project's transportation impacts. Generally, vehicle miles traveled is the most appropriate measure of transportation impacts. For the purposes of this section, "vehicle miles traveled" refers to the amount and distance of automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Except as provided in subdivision (b)(2) below (regarding roadway capacity), a project's effect on automobile delay shall not constitute a significant environmental impact.

(b) Criteria for Analyzing Transportation Impacts.

(1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.
(2) Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.
(3) Qualitative Analysis. If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.
(4) Methodology. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other

measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

(c) Applicability.

The provisions of this section shall apply prospectively as described in section 15007. A lead agency may elect to be governed by the provisions of this section immediately. Beginning on July 1, 2020, the provisions of this section shall apply statewide.

Technical Advisory on Evaluating Transportation Impacts in CEQA

The OPR's Technical Advisory on Evaluating Transportation Impacts in CEQA includes potential significance thresholds for different types of land use projects and transportation projects. Distinct threshold recommendations are provided for residential, office, and retail projects. Such uses tend to have the greatest influence on VMT. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types. In developing thresholds for other project types, the Technical Advisory on Evaluating Transportation Impacts in CEQA directs lead agencies to consider the purposes described in Section 21099 of the PRC and regulations in the CEQA Guidelines on the development of thresholds of significance (e.g., CEQA Guidelines Section 15064.7). The Technical Advisory on Evaluating Transportation Impacts in CEQA suggests that lead agencies may screen out VMT impacts using project size, map-based approaches to low-VMT areas, transit availability, and provision of affordable housing.

Local Regulations

The following are the regulatory agencies and regulations pertinent to the proposed project on a local level.

Contra Costa Transportation Authority

The CCTA is a public agency formed by the Contra Costa voters to manage the County's transportation sales tax program and perform countywide transportation planning. The 2017 Countywide Comprehensive Transportation Plan, adopted September 20, 2017, is the CCTA's most recent, broadest policy and planning document.[4] The Plan identifies the criteria for analyzing transportation impacts and sets forth plans for future roadway improvements in the County. In addition, the Plan relies on collaboration with and between partners, both on the countywide and regional levels. Each of the County's five Regional Transportation Planning Committees created an Action Plan, which identifies a complete list of actions to be completed as a result of the Action Plan.

As part of the Action Plan process, each Regional Transportation Planning Committee identified projects and programs in the form of actions to be included in the Action Plan for the Routes of Regional Significance. Each Action Plan states the vision, goals, and policies; designates Routes of Regional Significance; sets objectives for such routes; and presents specific actions to achieve established objectives. The actions are listed on both a route-by-route and a regional scale, and aim to support the transportation objectives as specified by each Regional Transportation

[4] Contra Costa County Transportation Authority. *2017 Countywide Comprehensive Transportation Plan.* Adopted September 20, 2017.

Planning Committee. The latest East County Action Plan for Routes of Regional Significance was adopted September 2017.[5]

LOS Thresholds

Based on CCTA guidance, identifying improvements to address operational deficiencies would be required under the following circumstances:

- Development projects where the addition of project traffic to an intersection(s) results in the degradation of intersection operations from acceptable LOS D or better to unacceptable operations (LOS E or LOS F). Priority Development Areas ("PDA") and routes of regional significance tolerate a higher level of congestion and therefore LOS E is considered acceptable operation. However, improvements are required if LOS degrades to F; or
- Development projects where the addition of project traffic to an intersection(s) operating unacceptably before the addition of project trips results in the exacerbation of unacceptable operations by increasing the average control delay (for signalized and all-way stop-controlled intersections) or worst movement/approach delay (for side-street stop-controlled intersections) at the intersection by more than 5.0 seconds.

VMT Thresholds

On July 15, 2020, the CCTA adopted criteria, standards, and thresholds for the assessment of VMT in the *Approval of the Vehicle Miles Traveled Analysis Methodology for Land Use Projects in the Growth Management Program*. The methods and thresholds adopted by CCTA follow the guidance and recommendations of OPR pertaining to the implementation of SB 743. Current CCTA guidance related to VMT is as follows:

- Residential Projects should use the home-based VMT per capita metric to evaluate project generated VMT. The project generated home-based VMT per resident constitutes a significant impact if it is higher than 85 percent of the home-based VMT per resident in the subject municipality or unincorporated Authority subregion (for areas outside of municipalities) or 85 percent of the existing county-wide average home-based VMT per resident, whichever is less stringent.
- Employment-Generating Projects should use the home-work VMT per worker metric for their project generated VMT estimates. The project generated home-work WMT per worker constitutes a significant impact if it is higher than 85 percent of the home-work VMT per worker in the subject municipality or unincorporated Authority subregion (for areas outside of municipalities) or 85 percent of the existing Bay Area region-wide average home-work VMT per worker, whichever is less stringent.
- Other Uses and Projects need to be analyzed using a methodology developed by the lead agency specifically for the project, taking into account the specific methodologies and thresholds identified in *Approval of the Vehicle Miles Traveled Analysis Methodology for Land Use Projects in the Growth Management Program*.
- Mixed-Use Projects may be analyzed using a combination of techniques.

In addition, CCTA guidance provides the following criteria to screen projects out of conducting a project-level VMT analysis:

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[5] Contra Costa County Transportation Authority. *East County Action Plan for Routes of Regional Significance.* September 2017.

- CEQA Exemption – Any project that is exempt from CEQA is not required to conduct a VMT analysis.
- Small projects – Small projects can be presumed to cause a less-than-significant VMT impact. Small projects are defined as having 10,000 sf or less of non-residential space or 20 residential units or less, or otherwise generating less than 836 VMT per day.
- Local-Serving Uses – Projects that consist of Local-Serving Uses can generally be presumed to have a less-than-significant impact absent substantial evidence to the contrary, because local serving projects would primarily draw users and customers from a relatively small geographic area that will lead to short-distance trips and trips that are linked to other destinations.
- Projects Located in Transit Priority Areas (TPAs) – Projects located within a TPA can be presumed to have a less-than-significant impact absent substantial evidence to the contrary.
- Projects located in Low VMT Areas – residential and employment-generating projects located within a low VMT-generating area can be presumed to have a less-than-significant impact absent substantial evidence to the contrary. A Low VMT area is defined as follows:
    - For housing projects: Cities, towns and unincorporated portions within Contra Costa that have existing home-based VMT per capita that is 85 percent or less of the existing county-wide average.
    - For employment-generating projects: Cities, towns, and unincorporated portions within Contra Costa that have existing home-work VMT per worker that is 85 percent or less of the existing regional average.

Local Regulations

Local rules and regulations applicable to the proposed project are discussed below.

City of Antioch General Plan

The following goals and policies from the City of Antioch General Plan are applicable to the proposed project, including policies from Section 4.4.6.7 specific to the Sand Creek Focus Area:

Policy 4.4.6.7.ff. The Sand Creek Focus Area is intended to be "transit-friendly," including appropriate provisions for public transit and nonmotorized forms of transportation.

Policy 4.4.6.7.ii. Development of an appropriate level of pedestrian and bicycle circulation throughout the community is to be provided, including pathways connecting the residential neighborhoods, as well as non-residential and recreational components of the community. Sand Creek Focus Area development should also provide recreational trail systems for jogging and bicycling, including areas for hiking and mountain biking. Trails along Sand Creek and Horse Valley Creek shall be designed so as to avoid impacting sensitive plant and amphibian habitats, as well as water quality.

Objective 7.3.1 Provide adequate roadway capacity to meet the roadway performance standards set forth in the Growth Management Element.

Policy 7.3.2.a Facilitate meeting the roadway performance standards set forth in the Growth Management Element and improving traffic flow on arterial roadways.

- Work with the UP and BNSF railroads to construct grade separations along the tracks at Somersville Road, Hillcrest Avenue, "A" Street, the proposed Viera Road extension, and the proposed Phillips Lane extension.
- Promote the design of roadways to optimize safe traffic flow within established roadway configurations by minimizing driveways and intersections, uncontrolled access to adjacent parcels, on-street parking, and frequent stops to the extent consistent with the character of adjacent land uses.
- Provide adequate capacity at intersections to accommodate future traffic volumes by installing intersection traffic improvements and traffic control devices, as needed, as development occurs.
- Facilitate the synchronization of traffic signals.
- Where needed, provide acceleration and deceleration lanes for commercial access drives.
- Provide for reciprocal access and parking agreements between adjacent land uses, thereby facilitating off-street vehicular movement between adjacent commercial and other nonresidential uses.
- Encourage regional goods movement to remain on area freeways and other appropriate routes.

Policy 7.3.2.b Design and reconfigure collector and local roadways to improve circulation within and connections to residential and commercial areas.

- Implement appropriate measures to mitigate speeding and other traffic impacts in residential areas.
- Implement roadway patterns that limit through traffic on local residential streets.

Policy 7.3.2.c Require the design of new developments to focus through traffic onto arterial streets.

Policy 7.3.2.d Where feasible, design arterial roadways, including routes of regional significance, to provide better service than the minimum standards set forth in Measure C and the Growth Management Element. Thus, where feasible, the City will strive to maintain a "High D" level of service (v/c [volume-to-capacity ratio] = 0.85 to 0.89) within regional commercial areas and at intersections within 1,000 feet of a freeway interchange. The City will also strive where feasible to maintain low-range "D" (v/c = 0.80 to 0.84) in all other areas of the City, including freeway interchanges.

Policy 7.3.2.e Establish Assessment Districts in areas that will require major roadway infrastructure improvements that will benefit only that area of the City, and thereby facilitate the up-front construction of needed roadways.

Policy 7.3.2.f Design street intersections to ensure the safe passage of through traffic and accommodate anticipated turning movements. Implement intersection improvements consistent with the following lane geometrics, unless traffic analyses indicate the need for additional turn lanes.

Policy 7.3.2.g Require traffic impact studies for all new developments that propose to increase the approved density or intensity of development or are projected to generate 50 peak hour trips or more at any intersection of Circulation Element roadways. The purpose of these studies is to demonstrate that:

- The existing roadway system, along with roads to be improved by the proposed project, can meet the performance standards set forth in Sections 3.4.1 and 3.4.2 of the Growth Management Element; and
- Required findings of consistency with the provisions of the Growth Management Element can be made.

Policy 7.3.2.k Where single family residences have no feasible alternative but to front on collector or arterial roadways, require, wherever possible, that circular driveways or on-site turnarounds be provided to eliminate the need for residents to back onto the street.

Policy 7.3.2.l Locate driveways on corner parcels as far away from the intersection as is possible.

Policy 7.3.2.m Avoid locating driveways within passenger waiting areas of bus stops or within bus bays. Locate driveways so that drivers will be able to see around bus stop improvements.

Policy 7.3.2.n Use raised medians as a method for achieving one or more of the following objectives: access control, separation of opposing traffic flows, left turn storage, aesthetic improvement, and/or pedestrian refuge.

Policy 7.3.2.o Where medians are constructed, provide openings at the maximum feasible intervals, typically no less than 1/8 mile.

Policy 7.3.2.v Private streets, where permitted, shall provide for adequate circulation and emergency vehicle access. Private streets that will accommodate more than 50 vehicles per hour in the peak hour or that are designed for on-street parking shall be designed to public street standards. The design of other private streets shall be subject to the review and approval of the City Engineer. Private streets shall be improved to public street standards prior to acceptance of dedications to the City.

Policy 7.3.2.x Require new development to construct all on-site roadways, including Circulation Element routes, and provide a fair share contribution for needed off-site improvements needed to maintain the roadway performance standards set forth in the Growth Management Element. Contributions for off-site improvements may be in the form of fees and/or physical improvements, as determined by the City Engineer. Costs associated with mitigating off-site traffic impacts should be allocated on the basis of trip generation, and should have provisions for lower rates for income-restricted lower income housing projects needed to meet the quantified objectives of the General Plan Housing Element.

Objective 7.4.1 Maintenance of a safe, convenient, and continuous network of pedestrian sidewalks, pathways, and bicycle facilities serving both experienced and casual bicyclists to facilitate bicycling and walking as alternatives to the automobile.

Policy 7.4.2.a Design new residential neighborhoods to provide safe pedestrian and bicycle access to schools, parks and neighborhood commercial facilities.

Policy 7.4.2.b Design intersections for the safe passage of pedestrians and bicycles through the intersection.

Policy 7.4.2.c	Provide street lighting that is attractive, functional, and appropriate to the character and scale of the neighborhood or area, and that contributes to vehicular, pedestrian, and bicycle safety.
Policy 7.4.2.d	Maintain roadway designs that maintain mobility and accessibility for bicyclists and pedestrians.
Policy 7.4.2.e	Integrate multi-use paths into creek corridors, railroad rights-of-way, utility corridors, and park facilities.
Policy 7.4.2.f	Provide, as appropriate, bicycle lanes (Class II) or parallel bicycle/pedestrian paths (Class I) along all arterial streets and high volume collector streets, as well as along major access routes to schools and parks.
Policy 7.4.2.j	Permit the sharing or parallel development of pedestrian walkways with bicycle paths, where this can be safely accomplished, in order to maximize the use of public rights-of-way.
Policy 7.4.2.l	Require the construction of attractive walkways in new residential, commercial, office, and industrial developments, including provision of shading for pedestrian paths.
Policy 7.4.2.m	Maximize visibility and access for pedestrians, and encourage the removal of barriers for safe and convenient movement of pedestrians.
Policy 7.4.2.n	Ensure that the site design of new developments provides for pedestrian access to existing and future transit routes and transit centers.
Policy 7.4.2.o	Pave walks and pedestrian pathways with a hard, all-weather surface that is easy to walk on. Walks and curbs should accommodate pedestrians with disabilities. Walks within open space areas should have specially paved surfaces that blend with the surrounding environment.
Policy 7.4.2.p	In general, design walks to provide a direct route for short to medium distance pedestrian trips, and to facilitate the movement of large numbers of pedestrians. Meandering sidewalks are appropriate in areas where the natural topography or low-density land uses lend themselves to informal landscapes.

Objective 7.5.1 Maintenance of rail and bus transit, providing both local and regional service that is available throughout the week, and operates on par with automobile travel during peak commute hours.

Policy 7.5.2.g Preserve options for future transit use when designing roadway and highway improvements.

Policy 7.5.2.i Include Tri-Delta Transit in the review of new development projects, and require new development to provide transit improvements in proportion to traffic demands created by the project. Transit improvements may include direct and paved access to transit stops, provision of bus turnout areas and bus shelters, and roadway geometric designs to accommodate bus traffic.

Objective 3.4.3 Maintain acceptable traffic levels of service on City roadways through implementation of Transportation Systems Management, Growth Management, and the City's Capital Improvement Program, and ensure that individual development projects provide appropriate mitigation for their impacts.

Policy 3.4.4.a Place ultimate responsibility for mitigating the impacts of future growth and development, including construction of new and widened roadways with individual development projects. The City's Capital Improvements Program will be used primarily to address the impacts of existing development, and to facilitate adopted economic development programs.

Policy 3.4.4.b Continue to develop and implement action plans for routes of regional significance (see Circulation Element requirements).

Policy 3.4.4.c Ensure that development projects pay applicable regional traffic mitigation fees and provide appropriate participation in relation to improvements for routes of regional significance (see also Circulation Element Policy 5.3.1f).

Policy 3.4.4.d Consider level of service standards along basic routes to be met if 20-year projections based on the City's accepted traffic model indicate that conditions at the intersections that will be impacted by the project will be equivalent to or better than those specified in the standard, or that the proposed project has been required to pay its fair share of the improvement costs needed to bring operations at impacted intersections into conformance with the applicable performance standard.

4.2.4 IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential impacts related to transportation.

Standards of Significance

Consistent with Appendix G of the CEQA Guidelines, the proposed project would be considered to result in a significant adverse impact on the environment in relation to transportation and circulation if the project would result in any of the following:

- Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities;
- Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b);
- Substantially increase hazards to vehicle safety due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
- Result in inadequate emergency access.

Method of Analysis

The analysis methodology provided in the TIA prepared for the proposed project by Fehr & Peers is discussed below. It should be noted that the analysis included in the TIA is based on an early iteration of the project that included 300 single-family dwelling units, as opposed to the 294 single-family dwelling units that would be developed as part of the proposed project. Because the number of units analyzed within the TIA is greater than what is proposed as part of the project, the analysis provides a conservative approach, and the proposed project would be expected to result in similar, or slightly reduced impacts as compared to what is presented in the TIA and incorporated into this chapter of the EIR.

LOS Analysis

Pursuant to CEQA Guidelines, VMT is the primary metric used to identify transportation impacts to roadway systems within this chapter. However, in order to analyze the proposed project's compliance with a program, plan, ordinance, or policy addressing the circulation system as outlined in the General Plan and CCTA East County Action Plan, the analysis below incorporates LOS.

The TIA's analysis of LOS was performed in accordance with the City of Antioch General Plan and the CCTA East County Action Plan. The TIA based its conclusions on the following thresholds of significance:

City of Antioch/CCTA Intersection and Freeway Standards

Based on applicable guidance provided in the City of Antioch General Plan and the CCTA East County Action Plan, the proposed project could be considered to conflict with a program, plan, ordinance, or policy addressing the circulation system if the project would result in any of the following:

- Cause the operations of a study intersection on a Route of Regional Significance (i.e., all study intersections) to decline from LOS high-D (an average delay of 55 seconds for signalized intersections) or better to LOS E or F, based on the HCM LOS method;
- Cause the operations of a study intersection not on a route of regional significance to decline from the established performance standard for the roadway facility type (i.e., LOS

Low-E for intersections within 1,000 feet of a freeway interchange; LOS high-D or better to a LOS E or F, for residential and commercial portions of the Rivertown Focus Area; and LOS mid-D or better to a high-LOS D, LOS E or F, for residential and arterial roadways in non-regional commercial areas;
- Deteriorate already unacceptable operations at a signalized intersection;
- Cause operations of an unsignalized study intersection to decline from acceptable to unacceptable, and would require the installation of a traffic signal based on the Manual on Uniform Traffic Control Devices (MUTCD) Peak Hour Signal Warrant (Warrant 3);
- Result in, or worsen, unacceptable operations (i.e., delay index of greater than 2.5 during the AM or PM peak hour) on the SR 4 mainline.

LOS Analysis Scenarios

The following analysis scenarios are included in this chapter:

- **Existing:** Existing conditions based on traffic counts collected at the aforementioned intersections when area schools were in normal session.
- **Existing With Project:** Existing with Project conditions based on existing traffic counts plus traffic generated by the proposed project. The scenario also assumes the development of the Promenade and Creekside neighborhoods of the Creekside/Vineyards at Sand Creek project, which would construct roadways that could provide access to the Albers Ranch Project site. Development of the Promenade and Creekside neighborhoods of the Creekside/Vineyards at Sand Creek project was determined to be the most feasible scenario to provide access to the project site, as opposed to the inclusion of an alternate access connecting to future Sand Creek Road as part of the Aviano Project to the north of the site.
- **Near-Term Without Project**: Conditions based on existing traffic counts plus traffic from approved and pending projects expected to be developed in the next five to 10 years. The near-term scenario includes traffic from approved projects in the vicinity of the study area that could result in changed travel patterns at the study intersections. The existing traffic counts were also increased by one percent per year for five years, consistent with regional growth trends predicted by the CCTA model, to account for traffic increases from projects not within the immediate study area.
- **Near-Term With Project**: Near-Term conditions with project-related traffic.
- **Cumulative Without Project**: Forecasts for the cumulative scenario based on traffic growth trends as described in both the Antioch and Brentwood General Plan EIR, and supplemented by a check of traffic forecasts for the study area in the most recent CCTA Countywide travel demand model. The scenario reflects expected conditions in 2040.
- **Cumulative With Project**: Future forecast conditions with project-related traffic.

Near-Term Scenario Assumptions

In order to develop the Near-Term Without Project condition, the City of Brentwood Project Status as of March 2020 and City of Antioch Project Pipeline (as of March 2020) were reviewed by Fehr & Peers to identify planned and pending development within the project region. Such development projects are summarized in Table 2 of the TIA (see Appendix F to this EIR). In addition, a number of roadway improvements are conditioned on near-term developments and considered in the near-term forecasts, and are provided within the TIA. Signal timings were adjusted, as necessary, during the evaluation of the intersections without and with project impacts (see Appendix F to this EIR).

Cumulative Scenario Assumptions

To assess future growth with planned development in the East County Area, several sources of data were reviewed as part of the TIA, including the CCTA Travel Demand Model, future traffic projections as documented in the administrative draft Antioch Transportation Impact Fee, future projections from the City of Brentwood Priority Area 1 Specific Plan EIR (June 2018), and projections developed as part of future development projects in the area (see Appendix F to this EIR).

Intersection Operations Analysis

Traffic conditions at signalized intersections were evaluated using methods developed by the Transportation Research Board (TRB), as documented in the 2010 HCM for vehicles using the analysis software Synchro 10.0. The HCM method calculates control delay at an intersection based on inputs such as traffic volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors. For unsignalized (all-way stop controlled and side-street stop controlled) intersections, the 2010 HCM method for unsignalized intersections was used, wherein operations are defined by the average control delay per vehicle (measured in seconds). The control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in queue. At side-street stop-controlled intersections, the delay is calculated for each stop-controlled movement, the left turn movement from the major street, as well as the intersection average. The intersection average delay and highest movement/approach delay are reported for side-street stop-controlled intersections.

Project Trip Generation

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Estimates are created for the daily condition and for the peak one-hour period during the morning and evening commute when traffic volumes on the adjacent streets are typically the highest. Project trip generation was estimated using rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition). Using the ITE rates, trip generation estimates were developed for the proposed project, as presented in Table 4.2-7.

As shown in the table, the proposed project is expected to generate approximately 4,732 new daily vehicle trips, including approximately 288 morning peak hour and 488 evening peak hour trips. Trips generated by the proposed project include the trip generating potential of both the single-family detached residences, as well as the proposed assisted living facility and neighborhood commercial uses.

Project Trip Distribution and Assignment

Estimates of regional project trip distribution were developed based on existing travel patterns in the area, a select zone analysis using the CCTA travel demand model, and the location of complementary land uses. Separate estimates were developed for the residential, assisted living and neighborhood commercial portions of the project as the land uses have different access points. The resulting trip distribution percentages are shown on Figure 4.2-3. While the overall trip distribution is expected to be similar in various analysis scenarios, project trip assignment would differ between analysis scenarios as additional off-site roadways are constructed. For example, in the near-term scenario, Sand Creek Road would be extended from west of Hillcrest Avenue to SR 4, providing an additional route for project trips to access SR 4 and destinations within the City of Brentwood.

Figure 4.2-3
Project Trip Distribution

Source: Fehr & Peers, 2022.

In each analysis scenario, project trips were assigned to the appropriate roadway network based on the directions of approach and departure (see Figure 4.2-4 through Figure 4.2-6).

Table 4.2-7
Project Trip Generation

Land Use	Unit/ Quantity	Trip Generation						
		Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Single-Family Detached Housing[1]	300 Dwelling Units	2,832	55	167	222	187	110	297
Assisted Living[2]	150 Beds	390	18	11	29	15	24	39
Neighborhood Commerical[3]	40,000 SF	1,510	24	14	38	73	79	152
Total Project Trips		***4,732***	***96***	***192***	***288***	***275***	***213***	***488***

Notes:
1 ITE land use category 210 – Single-Family Homes (Adj Streets, 7-9A, 4-6P):
Daily: (T) = 9.44 (X)
AM Peak Hour: T = 0.74 (X); Enter = 25%; Exit = 75% PM Peak Hour: T = 0.99 (X); Enter = 63%; Exit = 37%
2 ITE land use category 254 – Assisted Living (Adj Streets, 7-9A, 4-6P):
Daily: (T) = 2.60(X)
AM Peak Hour: T = 0.19(X); Enter = 63%; Exit =37%
PM Peak Hour: T = 0.26(X); Enter = 38%; Exit = 62%
3 ITE land use category 820 – Shopping Center (Adj. Streets, 7-9A, 4-6P)
Daily: (T) = 37.75(X)
AM Peak Hour: T = 0.94(X); Enter = 62%; Exit =38%
PM Peak Hour: T = 3.81(X); Enter = 48%; Exit = 52%

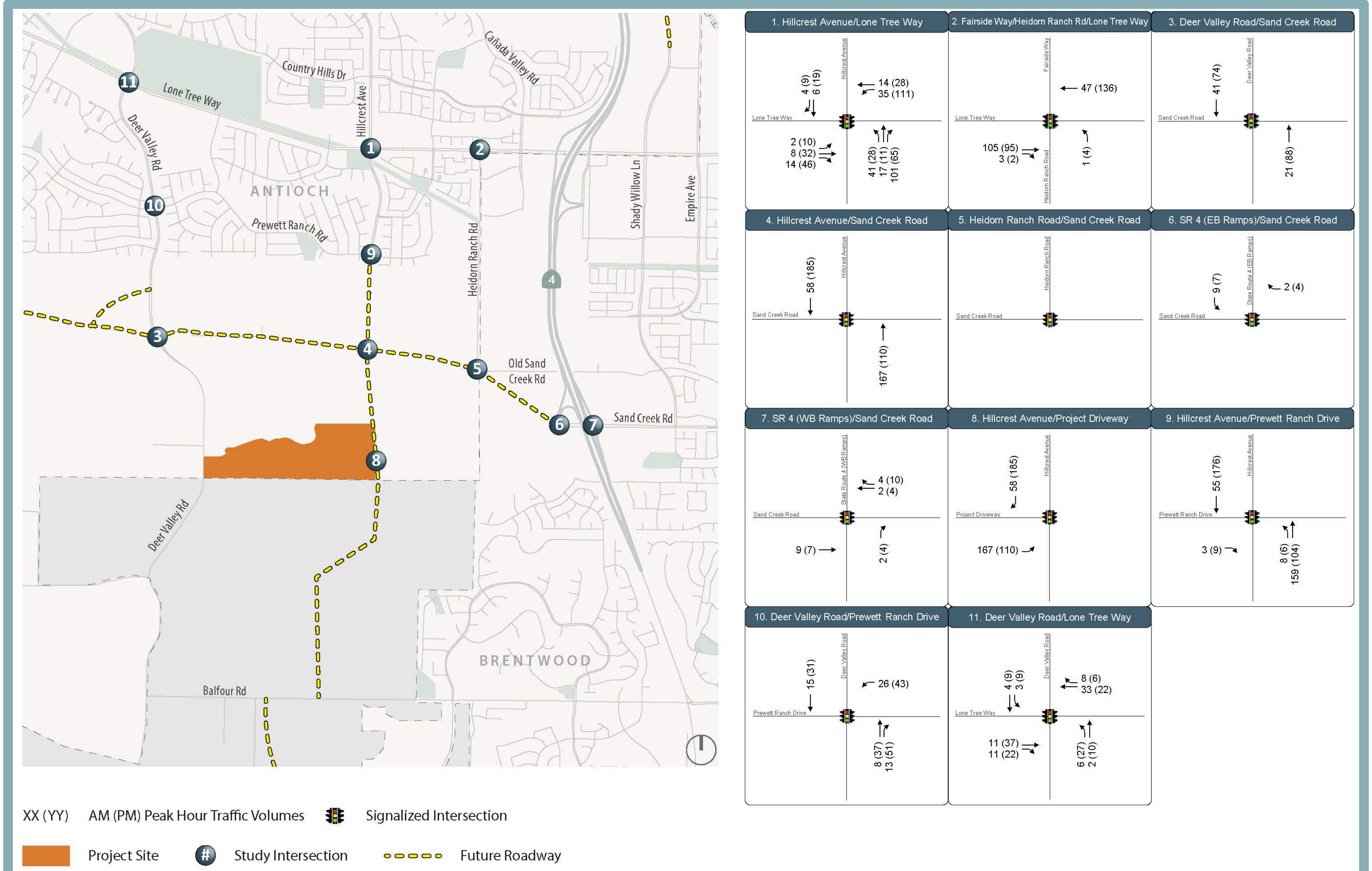
Source: Fehr & Peers, 2022.

Project VMT

Section 15064.3 of the CEQA Guidelines provides specific considerations for evaluating a project's transportation impacts. Pursuant to Section 15064.3, analysis of VMT attributable to a project is the most appropriate measure of transportation impacts. While changes to driving conditions that increase intersection delay are an important consideration for traffic operations and management, the method of analysis does not fully describe environmental effects associated with fuel consumption, emissions, and public health. Section 15064.3(3) changes the focus of transportation impact analysis in CEQA from measuring impact to drivers to measuring the impact of driving.

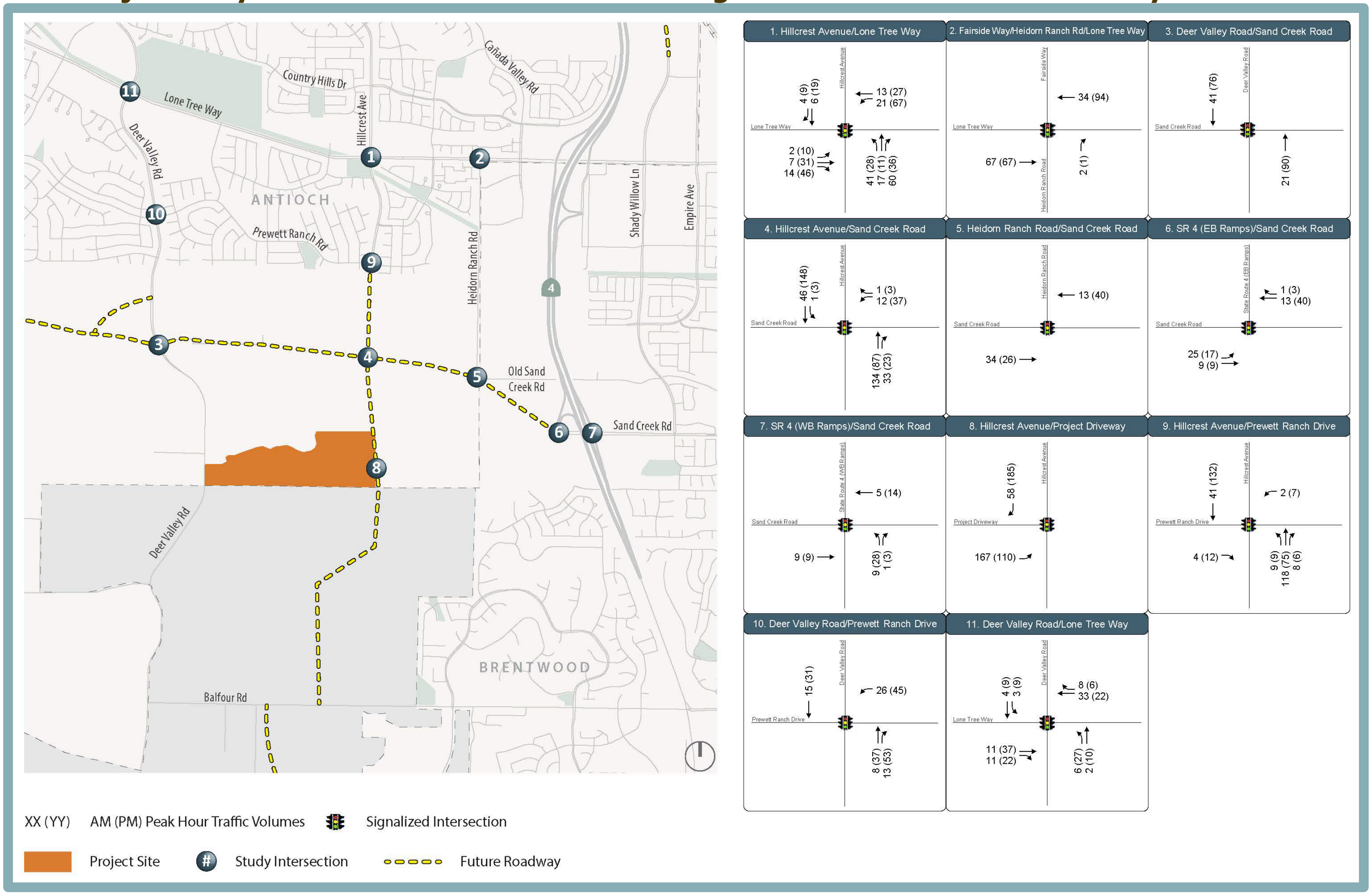
OPR's Technical Advisory on Evaluating Transportation Impacts in CEQA provides recommendations on many aspects of conducting a CEQA transportation analysis using VMT. In addition, on July 15, 2020, the CCTA adopted criteria, standards, and thresholds for the assessment of VMT in the *Approval of the Vehicle Miles Traveled Analysis Methodology for Land Use Projects in the Growth Management Program*. The methods and thresholds adopted by CCTA follow the guidance and recommendations of OPR pertaining to the implementation of SB 743. The City of Antioch has not established any standards or thresholds on VMT. Therefore, guidance from the CCTA and OPR was used as the criteria for the purpose of this analysis. As presented above, the CCTA guidance, consistent with OPR recommendations, considers residential projects that generate VMT per capita at 15 percent less than the existing Countywide average to result in a less than significant impact related to VMT. Similarly, employment projects that generate VMT per employee 15 percent less than the existing Bay Area average could be considered to result in a less-than-significant impact related to VMT.

Figure 4.2-4
Project Only Traffic Volumes and Lane Configurations: Existing Roadway Network



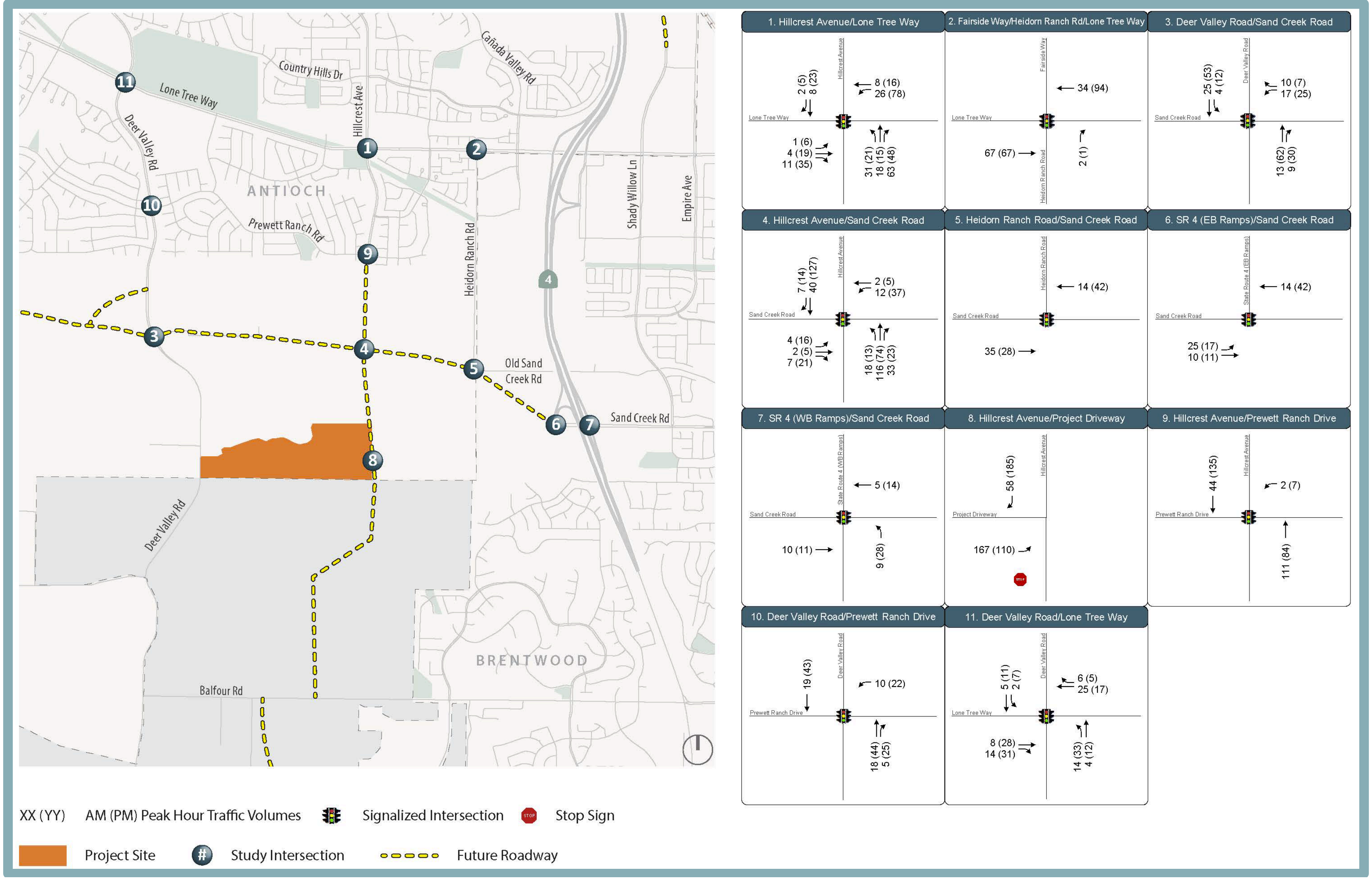
Source: Fehr & Peers, 2022.

Figure 4.2-5
Project Only Traffic Volumes and Lane Configurations: Near Term Roadway Network



Source: Fehr & Peers, 2022.

Figure 4.2-6
Project Only Traffic Volumes and Lane Configurations: Cumulative Roadway Network



Source: Fehr & Peers, 2022.

In addition, local-serving uses meet the CCTA and OPR screening criteria, and, therefore, are presumed to have a less-than-significant impact.

In order to analyze VMT associated with existing development in the project area and the proposed project, Fehr & Peers used the CCTA travel demand model to estimate average daily vehicle miles of travel for each of the project's proposed components. Pursuant to CCTA guidance, home-based VMT was used to evaluate project generated VMT for the residential portion of the project. For the purposes of the VMT Analysis, the project's Assisted Living Facility was categorized as employment-generating, given that the trip generating potential of its employees is higher than that of its residents. As such, home-work VMT was used to evaluate the project generated VMT for the assisted living portion of the project. The project's neighborhood commercial component was assumed to be a local-serving use. Local-serving projects primarily draw users and customers from a relatively small geographic area that would lead to short-distance trips and trips that are linked to other destinations.

Project-Specific Impacts and Mitigation Measures

The proposed project impacts on the transportation system are evaluated in this section based on the thresholds of significance and methodology described above. Each impact is followed by recommended mitigation to reduce the identified impacts, if needed.

4.2-1 Conflict with a program, plan, ordinance, or policy addressing the circulation system during construction activities. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

Construction activities associated with the proposed project would include the use of construction vehicles, including vehicles removing or delivering fill material and building materials, bulldozers, and other heavy machinery, as well as construction worker activity. The project would include the export of approximately 300,000 cubic yards (CY) of fill material and, thus, would require the use of haul trucks for material movement. However, haul truck traffic would be temporary, and would be limited to normal working hours, as specified by the City's General Plan and Municipal Code. In addition, all construction traffic generated by the proposed project would be required to follow designated truck routes, and project construction would likely stage any large vehicles (i.e., earth- moving equipment, cranes, etc.) on the site prior to beginning site work and remove such vehicles at project completion. However, detailed information relating to the construction schedule during site development or a construction management plan is not available. Once the construction schedule is finalized, the schedule would require City review in conjunction with the schedule of construction of neighboring projects. In the absence of such review, construction traffic associated with the proposed project could result in short-term adverse effects to the local roadway system, and a ***significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

4.2-1 *Prior to issuance of grading and building permits, the project applicant shall submit a construction management plan, subject to review and approval by the City Engineer. The requirements within the construction* *management plan shall include, but are not necessarily limited to, the following elements:*

- *Project staging plan to maximize on-site storage of materials and equipment;*
- *A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak hours; lane closure proceedings; signs, cones, and other warning devices for drivers; and designation of construction access routes;*
- *Permitted construction hours;*
- *Location of construction staging;*
- *Identification of parking areas for construction employees, site visitors, and inspectors, including on-site locations; and*
- *Provisions for street sweeping to remove construction related debris on public streets.*

4.2-2 Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

The following discussions evaluate whether the proposed project would result in impacts to existing or planned transit, bicycle, or pedestrian facilities and services within the project vicinity or inconsistencies with the City's LOS standard.

Transit, Bicycle, and Pedestrian Facilities

As discussed above, three Tri Delta Transit routes, Routes 379, 388, and 392, operate in the vicinity of the project site. In addition to the regular transit service to the project area, dial-a-ride door-to-door service is available for disabled people of all ages and senior citizens, and Tri MyRide provides an on-demand rideshare service within the project vicinity. BART also provides fixed rail transit to Eastern Contra Costa County, with the terminus station located in Antioch at the Hillcrest Avenue interchange, approximately four miles from the project site. The proposed project does not include features that would conflict with existing or planned transit services. Furthermore, while residents of the proposed project may result in a slight increase in demand on existing transit services in the region, such demand is unlikely to cause an appreciable change in system ridership, and the project would not degrade transit operations.

The project includes the construction of internal roadways with travel lanes 10 feet in width, adjacent to eight feet wide on-street parking. While the project does not include any designated bicycle facilities (lanes, routes, or paths), bicycles would be permitted on all internal roadways. Bicycle access is not currently provided in the area, such that bicycle access in the area would be disrupted during the project construction phase. The proposed project does not include any features that would be hazardous to bicycle travel and does not conflict with any bicycle facilities plans or programs. However, the amount of designated bicycle parking that would be provided for the assisted living or retail portions of the project is currently unknown. Section 9-5.1707 of the City of

Antioch Municipal Code requires one bicycle parking space for every 25 off-street vehicle parking spaces required, for commercial, retail, wholesale, and industrial uses. Thus, without the provision of the required bicycle parking spaces the proposed project would not provide adequate bicycle infrastructure.

With regard to pedestrian facilities, sidewalks of varying width would be provided along the internal roadway network of the proposed project. Additionally, a network of trails is proposed throughout the project site, connecting sidewalk facilities with parks and open space. Pedestrian access is not currently provided in the area, such that pedestrian access in the area would be disrupted during the project construction phase. The proposed sidewalks would be constructed to meet City of Antioch standards, completing the sidewalk network in the project area. However, the design of pedestrian crossings at key intersections and trail connections within the project site are not currently detailed. Failure to provide adequate infrastructure at pedestrian crossings could create unsafe pedestrian conditions and would be inconsistent with City standards.

Based on the above, the proposed project could conflict with an applicable plan, ordinance, or policy addressing the circulation system, specifically related to bicycle and pedestrian facilities, and a significant impact could occur.

LOS Analysis

As described above, local jurisdictions may no longer rely on vehicle LOS and similar measures related to delay as the basis for determining the significance of transportation impacts under CEQA. However, because the City considers LOS a matter of General Plan policy, a nexus exists for requiring a project to ensure General Plan consistency through project conditions of approval. Accordingly, the following LOS analysis is included for informational purposes only to support the City's determination regarding project consistency with General Plan goals and policies.

Study Intersections Under Existing With Project Conditions

Based on the assumptions included in the TIA (see Appendix F of this EIR), the Existing With Project analysis results are presented in Table 4.2-8.

As shown in Table 4.2-8, all study intersections would continue to operate acceptably under Existing With Project conditions. Therefore, the proposed project would not conflict with applicable City/CCTA standards for study intersections.

Study Intersections Under Near-Term With Project Conditions

Based on the assumptions included in the TIA (see Appendix F of this EIR), the results of the Near-Term With Project analysis are presented in Table 4.2-9 below.

In the Near-Term Without Project condition, all study intersections would operate at acceptable service levels. With the addition of project traffic, all study intersections would continue to operate at acceptable service levels. Therefore, the proposed project would not conflict with applicable City/CCTA standards for study intersections under Near-Term With Project conditions.

Table 4.2-8
Intersection LOS – Existing With Project

Intersection	Control[1]	Peak Hour	Existing		Existing with Project	
			Delay[2,3]	LOS	Delay[2,3]	LOS
1. Lone Tree Way at Hillcrest Avenue	Signal	AM PM	18 21	B C	26 32	C C
2. Lone Tree Way at Heidorn Ranch Road/Fairside Way	Signal	AM PM	11 12	B B	11 15	B B
3. Sand Creek Road at Deer Valley Road	Signal	AM PM	10 6	A A	10 7	A A
4. Sand Creek Road at Hillcrest Avenue (Future Intersection)	Signal	AM PM	-- --	-- --	-- --	-- --
5. Sand Creek Road at Heidorn Ranch Road (Future Intersection)	Signal	AM PM	-- --	-- --	-- --	-- --
6. Sand Creek Road at SR 4 Eastbound Ramps	Signal	AM PM	9 8	A A	9 7	A A
7. Sand Creek Road at SR 4 Westbound Ramps	Signal	AM PM	5 5	A A	5 5	A A
8. Hillcrest Avenue at Project Access (Future Intersection)	SSSC	AM PM	-- --	-- --	7 (10) 4 (10)	A (A) A (A)
9. Hillcrest Avenue at Prewett Ranch Drive	Signal	AM PM	19 17	B B	32 23	C C
10. Deer Valley Road at Prewett Ranch Drive	Signal	AM PM	27 14	C B	32 16	C B
11. Deer Valley Road at Lone Tree Way	Signal	AM PM	30 21	C C	30 22	C C

Notes:
1 Signal = Signalized intersection; SSSC = Side-street stop-controlled intersections; traffic on main street does not stop while traffic on the side-street is controlled by a stop sign.
2 Average intersection delay is calculated for all signalized intersections using the HCM 6th method for vehicles.
3 For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.

Source: Fehr & Peers, 2022.

Table 4.2-9
Intersection LOS – Near Term With Project

Intersection	Control[1]	Peak Hour	Near Term Without Project		Near Term with Project	
			Delay[2,3]	LOS	Delay[2,3]	LOS
1. Lone Tree Way at Hillcrest Avenue	Signal	AM PM	22 45	C D	29 54	C D
2. Lone Tree Way at Heidorn Ranch Road/Fairside Way	Signal	AM PM	17 26	B C	17 27	B C
3. Sand Creek Road at Deer Valley Road	Signal	AM PM	19 17	B B	19 17	B B
4. Sand Creek Road at Hillcrest Avenue (Future Intersection)	Signal	AM PM	22 20	C C	29 28	C C
5. Sand Creek Road at Heidorn Ranch Road (Future Intersection)	Signal	AM PM	19 19	B B	19 19	B B
6. Sand Creek Road at SR 4 Eastbound Ramps	Signal	AM PM	25 39	C D	28 44	C D
7. Sand Creek Road at SR 4 Westbound Ramps	Signal	AM PM	9 10	A B	9 10	A B
8. Hillcrest Avenue at Project Access (Future Intersection)	SSSC	AM PM	7 (9) 3 (9)	A (A) A (A)	7 (10) 4 (10)	A (A) A (A)
9. Hillcrest Avenue at Prewett Ranch Drive	Signal	AM PM	20 15	C B	21 17	C B
10. Deer Valley Road at Prewett Ranch Drive	Signal	AM PM	47 26	D C	49 30	D C
11. Deer Valley Road at Lone Tree Way	Signal	AM PM	40 33	D C	41 35	D D

Notes:
1 Signal = Signalized intersection; SSSC = Side-street stop-controlled intersections; traffic on main street does not stop while traffic on the side-street is controlled by a stop sign.
2 Average intersection delay is calculated for all signalized intersections using the HCM 6th method for vehicles.
3 For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.

Source: Fehr & Peers, 2022.

Study Freeway Segments Under Existing With Project Conditions

The Existing With Project AM and PM peak hour freeway operations are summarized in Table 4.2-10 below.

As shown in the table, all study freeway segments would continue to operate within the established service objective (i.e., delay index of 2.5 or less during the peak hours) with the addition of project traffic. Therefore, the proposed project would not conflict with applicable CCTA standards for study freeway segments under Existing With Project conditions.

Table 4.2-10 Freeway LOS – Existing With Project					
		Existing		Existing Plus Project	
Segment	Direction	Volume	Delay Index	Volume	Delay Index
AM Peak Hour					
1. SR 4, north of Lone Tree Way	NB	2,787	1.01	2,834	1.01
	SB	2,887	1.01	3,039	1.02
2. SR 4, north of Sand Creek Road	NB	2,448	1.00	2,544	1.01
	SB	2,815	1.01	2,848	1.01
3. SR 4, north of Balfour Road	NB	2,009	1.00	2,069	1.00
	SB	2,014	1.00	2,036	1.00
4. SR 4, south of Balfour Road	NB	1,201	1.20	1,250	1.28
	SB	940	1.03	960	1.03
PM Peak Hour					
1. SR 4, north of Lone Tree Way	NB	3,711	1.11	3,885	1.16
	SB	2,975	1.02	3,092	1.03
2. SR 4, north of Sand Creek Road	NB	3,185	1.03	3,250	1.04
	SB	2,932	1.02	3,043	1.02
3. SR 4, north of Balfour Road	NB	2,038	1.00	2,078	1.00
	SB	2,220	1.00	2,288	1.00
4. SR 4, south of Balfour Road	NB	1,015	1.05	1,058	1.07
	SB	1,431	1.82	1,492	2.14
Source: Fehr & Peers, 2022.					

Study Freeway Segments Under Near-Term With Project Conditions

Near-Term freeway forecasts were developed based on the same method used to develop the near-term intersection forecasts, both without and with the proposed project. Planned, but not yet completed freeway improvements were not included in the evaluation of near-term freeway operations. The Near-Term With Project analysis results are presented in Table 4.2-11.

As shown in the table, in the Near-Term Without Project condition, operations of SR 4 south of Balfour Road are expected to degrade beyond the applicable CCTA 2.5 delay index standard. All other study freeway segments would continue to operate within acceptable standards. Given that the proposed project would add traffic to the impacted segments during both the AM and PM peak hours such that the delay index is expected to degrade beyond the applicable CCTA standard, the proposed project would conflict with applicable CCTA standards under Near-Term With Project Conditions. However, the proposed project would be required to implement the following Condition of Approval:

- The project applicant shall pay their fair share towards freeway improvement projects in the area, including the widening of State Route 4 between Balfour Road and Marsh Creek Road through the payment of the regional transportation impact fees to the East Contra Costa Regional Fee and Financing Authority (ECCRFFA).

Table 4.2-11
Freeway LOS – Near Term With Project

Segment	Direction	Near Term Without Project		Near Term Plus Project	
		Volume	Delay Index	Volume	Delay Index
AM Peak Hour					
1. SR 4, north of Lone Tree Way	NB	3,328	1.05	3,354	1.05
	SB	3,632	1.09	3,689	1.10
2. SR 4, north of Sand Creek Road	NB	2,982	1.02	2,982	1.02
	SB	3,452	1.06	3,452	1.06
3. SR 4, north of Balfour Road	NB	2,749	1.01	2,774	1.01
	SB	2,393	1.00	2,402	1.00
4. SR 4, south of Balfour Road	NB	1,793	**5.97**	1,812	**6.41**
	SB	1,258	1.29	1,268	1.31
PM Peak Hour					
1. SR 4, north of Lone Tree Way	NB	4,677	1.70	4,751	1.79
	SB	3,580	1.08	3,631	1.09
2. SR 4, north of Sand Creek Road	NB	3,911	1.17	3,911	1.17
	SB	3,483	1.07	3,483	1.07
3. SR 4, north of Balfour Road	NB	2,710	1.01	2,727	1.01
	SB	2,819	1.01	2,847	1.01
4. SR 4, south of Balfour Road	NB	1,502	2.20	1,523	2.35
	SB	1,932	**10.03**	1,960	**11.13**

Notes:
Bold text indicates an exceedance of the applicable CCTA 2.5 delay index standard.

Source: Fehr & Peers, 2022.

Implementation of the above Condition of Approval would ensure the proposed project would not conflict with applicable City/CCTA standards for freeway segments under Near-Term With Project conditions.

Conclusion

Based on the above, the proposed project could conflict with an applicable plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities, specifically related to bicycle and pedestrian facilities. Therefore, a ***significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential bicycle and pedestrian impacts to a *less-than-significant* level.

4.2-2 *The following requirements shall be noted on project improvement plans, subject to review and approval by the City of Antioch Community Development Department:*

- *City-standard ADA ramps shall be provided at all internal roadway intersections;*

- *Pedestrian paths shall be identified and marked crosswalks shall be installed at key uncontrolled pedestrian crossing locations, such as trail crossings and park connections;*
- *The project shall install all-way stop control and high visibility pedestrian crosswalks at the intersection of A Street and C Street;*
- *City standard sidewalks shall be installed on A Street connecting the project site to Hillcrest Avenue; and*
- *Bicycle parking shall be provided in accordance with Section 9-5.1707 of the City of Antioch Municipal Code for the retail and assisted living portions of the proposed project.*

4.2-3 Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b). Based on the analysis below, even with implementation of mitigation, the impact is *significant and unavoidable*.

A select zone analysis was conducted using the CCTA model whereby all the trips generated by the proposed residences were tracked through the transportation system. Based on the analysis, each future resident of the proposed single-family dwelling portion of the proposed project is estimated to generate approximately 35.5 VMT per day, including all trips that either start or end at home. Additionally, each employee of the project's Assisted Living Facility is estimated to generate approximately 23.2 vehicle miles of travel per day, including all trips that start at home and end at work, or vice-versa.

As shown previously in in Table 4.2-5, the average VMT per resident for the City of Antioch, Contra Costa County, and the Bay Area is 21.1, 16.1, and 12.7, respectively. Similarly, as shown previously in Table 4.2-6, the average VMT per employee for the City of Antioch, Contra Costa County, and the Bay Area is 12.1, 15.2, and 15.8, respectively. As discussed previously, pursuant to OPR and CCTA guidance, residential projects that generate VMT per capita at 15 percent less than the existing Countywide average, and employment projects that generate VMT per employee 15 percent less than the existing Bay Area average, may be considered less than significant. The level of vehicle travel associated with the proposed project would be higher than regional averages, due in part to the project's distance from major employment centers, as well as the relative distance to other destinations as compared to other parts of the City and region. Given that the per-capita VMT associated with the proposed project would exceed regional averages, the proposed project could conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b), and a ***significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potentially significant impact, but not to a less-than-significant level. Additional feasible mitigation measures do not exist to further reduce the impact. As such, the impact would remain *significant and unavoidable*.

4.2-3(a) *Prior to issuance of residential building permits, the project applicant shall develop a Transportation Demand Management (TDM) Plan for the residential components of the proposed project, including any anticipated phasing, and shall submit the TDM Plan to the City for review and approval. The TDM Plan shall identify trip reduction strategies as well as mechanisms for funding and overseeing the delivery of trip reduction programs and strategies. Trip reduction strategies applicable to the residential portions of the proposed project may include, but are not limited to, the following:*

- *Increase Transit Accessibility;*
- *Provide Traffic Calming Measures;*
- *Provide Carpooling Programs;*
- *Implement Car-Sharing Program;*
- *Provide a Transit Riders Guide;*
- *Provide an Online TDM Information Center;*
- *Increase Bicycle and Pedestrian Facilities/Amenities;*
- *Free Trial Rides on Transit Services; and*
- *Implement a Subsidized or Discounted Transit Program.*

4.2-3(b) *Prior to issuance of building permits for the assisted living facility, the project applicant shall develop a TDM Plan for the assisted living component of the proposed project, including any anticipated phasing, and shall submit the TDM Plan to the City for review and approval. The TDM Plan shall identify trip reduction strategies as well as mechanisms for funding and overseeing the delivery of trip reduction programs and strategies. Trip reduction strategies applicable to the employment portions of the proposed project may include, but are not limited to, the following:*

- *Provide Bicycle Maintenance Facilities;*
- *Price and Unbundle Parking;*
- *Provide Carpooling Programs;*
- *Implement Car-Sharing Program;*
- *Implement Loaner Bike Program;*
- *Provide a Transit Riders Guide;*
- *Provide a Dedicated Transportation Coordinator;*
- *Provide an Online TDM Information Center;*
- *Increase Bicycle and Pedestrian Facilities/Amenities;*
- *Increase Transit Accessibility;*
- *Provide Secure and Accessible Bike Parking;*
- *Free Trial Rides on Transit Services; and*
- *Implement a Subsidized or Discounted Transit Program.*

4.2-4 Substantially increase hazards to vehicle safety due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). Based on the analysis below, the impact is *less than significant*.

Primary access to the proposed project would be provided by a new on-site roadway connecting to the planned Hillcrest Avenue extension east of the site. The connection to Hillcrest Avenue is contingent upon construction of the Creekside/Vineyards at Sand Creek Project. In the event that the Creekside/Vineyards at Sand Creek Project is not constructed, access to the proposed project may be provided by an alternate roadway connecting the northern portion of the project site to the future Sand Creek Road included as an Irrevocable Offer of Dedication (IOD) as part of the Aviano Project. If the developer desires the optional roadway for development, the developer would need to acquire a portion of the right-of-way from the Contra Costa County Flood Control District (CCCFCD) in order to construct the alternate access. The sale of right-of-way is at the CCCFCD discretion.

The proposed project would not include any new sharp curves or dangerous intersections and would not be located in the vicinity of any such roadway features. In general, the project proposes a connected system of internal roadways with travel lanes 10 feet in width, adjacent to eight feet wide on-street parking. All proposed roadway improvements, including the proposed extension of Hillcrest Avenue, would comply with applicable City roadway design standards. In addition, the design of the on-site circulation system would not involve any features that would increase traffic hazards at the site. Furthermore, the proposed project would not introduce incompatible uses, such as heavy-duty truck traffic, to area roadways during operations. Potential impacts related to project construction traffic are discussed under Impact 4.2-1 above.

Access to the assisted living portion of the project would be provided by a new driveway on Deer Valley Road. The location and configuration of the access is not currently defined or designed, as the assisted living/commercial component would not be developed as part of the proposed project. Future development of the assisted living/commercial component would be subject to a Conditional Use Permit (CUP) prior to development. Nonetheless, as Deer Valley Road is a narrow two-lane rural roadway adjacent to the project site, Fehr & Peers recommends the following improvement measure be implemented as part of the assisted living/commercial project:

- **Deer Valley Road/Assisted Living Facility Driveway Design –** Design the intersection in accordance with City standards and ensure that adequate sight distance is provided for all movements. Provide a stop sign and stop markings for vehicles exiting the project site. Provide acceleration and deceleration lanes on Deer Valley Road for vehicles entering and exiting the project's driveway. At a minimum the dimensions illustrated within the Caltrans Highway Design Manual Figure 405.7 shall be provided.

Based on the above, the proposed project would not create a substantial vehicle safety risk. The proposed internal circulation system and other roadway improvements would be designed to minimize hazardous roadway design features, and the project would not introduce incompatible uses to area roadways. Therefore, a ***less-than-significant*** impact would occur.

Mitigation Measure(s)

None required.

4.2-5 Result in inadequate emergency access. Based on the analysis below, the impact is *less than significant*.

Several factors determine whether a project has sufficient access for emergency vehicles, including the following:

- Number of access points (both public and emergency access only);
- Width of access points; and
- Width of internal roadways;

Based on the 2016 California Fire Code, as amended by Contra Costa County Ordinance 2016-23, the minimum number of access roads serving residential development(s) shall be based upon the number of dwelling units served as follows:

- Development of one or two-family dwellings where the number of dwelling units exceed 30 shall be provided with two separate and approved fire apparatus access roads; where there are more than 30-dwelling units on a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3 of the California Fire Code, access from two directions shall not be required (D107.1).
- Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.

The proposed project would include two routes for emergency vehicle access (EVA). The first would be the connection of A Street to Hillcrest Avenue on the eastern side of the project site (i.e., the same route private vehicles would access the project site). A second EVA-only route would be provided from the western side of the site connecting Loop Street South to Deer Valley Road. The EVA-only route would follow the existing alignment of the unimproved private access road over a culvert, and would be locked with bollards. The proposed project would require Fire Marshall Site Plan Review to ensure the proposed project would provide adequate emergency vehicle access in accordance with State and local requirements, and that the EVA over the culvert would be sufficient to withstand the weight of emergency vehicles. Furthermore, all dwelling units would be equipped with automatic sprinkler systems in accordance with California Fire Code requirements.

It should be noted that the EVA-only route would be located within the 100-year floodplain. As discussed in Section X, Hydrology and Water Quality, of the Initial Study prepared for the proposed project (see Appendix A), a minimum of one foot clearance is required above the base flood elevation (BFE) for areas within the 100-year floodplain in order to ensure adequate access is maintained. As such, Mitigation Measure X-2 included in the Initial Study would require the preparation of a site-specific hydraulic analysis to determine the BFE in the vicinity of the proposed EVA. If the analysis determines that the portion of the proposed EVA within the floodplain would be less than one foot above the BFE, Mitigation Measure X-2 requires that the elevation of the portion of the EVA within the floodplain be raised to at least one foot above the BFE or to the satisfaction of the CCCFCD. Therefore, with implementation of Mitigation Measure X-2 set forth in the Initial Study, impacts related to the EVA access would be less-than-significant.

Based on the above, the proposed project would provide for sufficient emergency access, and a ***less-than-significant*** impact would occur.

Mitigation Measure(s)

None required.

Cumulative Impacts and Mitigation Measures

As defined in Section 15355 of the CEQA Guidelines, "cumulative impacts" refers to two or more individual effects which, when considered together, are considerable, compound, or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. The cumulative setting for the proposed project is discussed above under the Cumulative Scenario Assumptions section. For further detail related to the cumulative setting of the proposed project, refer to Chapter 5, Statutorily Required Sections, of this EIR.

Transit, Bicycle, and Pedestrian Facilities Analysis

It should be noted that increased traffic volumes on local roadway facilities under cumulative conditions would not substantially alter performance related to bicycle facilities, pedestrian facilities, transit facilities and services, and emergency vehicle access. Rather, impacts to such facilities under Cumulative With Project conditions would be identical to those discussed above. In addition, construction activities associated with the project would be complete prior to the cumulative analysis year. Therefore, such topics are not discussed further in the cumulative analysis presented herein.

VMT Analysis

Similarly, the VMT impact analysis included under Impact 4.2-3 would also apply to Cumulative Plus Project conditions. The VMT significance threshold compares project-generated VMT per resident to that of existing local and regional development. The VMT comparison is useful because the comparison provides information regarding how the project aligns with long-term environmental goals related to VMT established based on existing development levels. Use of VMT significance thresholds based on existing development levels is recommended in the OPR's Technical Advisory. The Technical Advisory indicates that VMT efficiency metrics, such as VMT per resident, may not be appropriate for CEQA cumulative analysis because they employ a denominator. Instead, the Technical Advisory recommends that an impact finding from an efficiency-based project-specific VMT analysis (i.e., Existing Plus Project conditions) would imply an identical impact finding for a cumulative VMT analysis.[6] An example provided by OPR explains that a project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact. Therefore, an analysis of VMT is not presented in this section as the conclusion would remain identical to that presented under Impact 4.2-3.

LOS Analysis

As discussed above, although not required pursuant to CEQA Guidelines and not used for determining significant impacts under CEQA, an analysis of the proposed project's consistency with the City's LOS standards are included herein for informational purposes.

Study Intersections Under Cumulative With Project Conditions

Table 4.2-12 below summarizes operations at each of the study intersections under Cumulative With Project conditions. As shown in the table, the following four intersections are projected to operate at deficient levels in the cumulative condition prior to the addition of project traffic; all other study intersections would operate acceptably:

1. Lone Tree Way at Hillcrest Avenue – LOS E, AM Peak Hour;
6. Sand Creek Road at SR 4 eastbound ramps – LOS F, AM and PM Peak Hour;
7. Sand Creek Road at SR 4 westbound ramps – LOS E, AM Peak Hour; and
9. Deer Valley Road at Prewett Ranch Drive – LOS E, AM Peak Hour.

Under Cumulative With Project conditions, the addition of project traffic would have a noticeable effect on operations at three of the four intersections listed above, with the exception of Sand Creek Road at SR 4 Westbound Ramps. All other study intersections would still operate acceptably. However, the project would increase vehicle delay and, thus, would be considered to deteriorate operations at intersections that already operate unacceptably (i.e., the Lone Tree Way at Hillcrest Avenue, Sand Creek Road at SR 4 eastbound ramps, and Deer Valley Road at Prewett Ranch Drive intersections).

It should be noted that at the Sand Creek Road at SR 4 Eastbound Ramps intersection, an improvement is planned to construct a diagonal on-ramp for eastbound Sand Creek Road to southbound SR 4; the planned improvement is included in the ECCRFFA regional fee program.

Poor operations at the Sand Creek Road at SR 4 Westbound Ramps intersection are primarily caused by development (as approved) in the City of Brentwood Priority Area One Specific Plan. Construction of an additional westbound right-turn only lane from westbound Sand Creek Road to northbound SR 4 would result in acceptable operations at the intersection. The improvement is not identified in the regional fee program. Should the improvement, or one of similar effectiveness, be added to the ECCRFFA program, the proposed project and other projects in Eastern Contra Costa County would pay their fair share towards the improvement's construction.

The project applicant would be required to participate in all applicable local and regional transportation impact fees, such as the ECCRFFA program, that would fund construction of

6 Governor's Office of Planning and Research. *Technical Advisory on Evaluating Transportation Impacts in CEQA* [pg. 6]. December 2018.

roadway improvements in the study area, including further improvements to the Sand Creek Road interchange.

Table 4.2-12
Intersection LOS – Cumulative With Project

Intersection	Control[1]	Peak Hour	Cumulative		Cumulative with Project	
			Delay[2,3]	LOS	Delay[2,3]	LOS
1. Lone Tree Way at Hillcrest Avenue	Signal	AM PM	**61** 50	**E** D	**76** **64**	***E*** ***E***
2. Lone Tree Way at Heidorn Ranch Road/Fairside Way	Signal	AM PM	23 35	C D	29 36	C D
3. Sand Creek Road at Deer Valley Road	Signal	AM PM	20 21	B C	20 22	C C
4. Sand Creek Road at Hillcrest Avenue (Future Intersection)	Signal	AM PM	46 52	D D	45 50	D D
5. Sand Creek Road at Heidorn Ranch Road (Future Intersection)	Signal	AM PM	15 33	B C	15 36	B D
6. Sand Creek Road at SR 4 Eastbound Ramps	Signal	AM PM	**93** **99**	**F** **F**	***97*** ***105***	***F*** ***F***
7. Sand Creek Road at SR 4 Westbound Ramps	Signal	AM PM	**72** 29	**E** C	**73** 30	**E** C
8. Hillcrest Avenue at Project Access (Future Intersection)	SSSC	AM PM	1 (10) 1 (11)	A (A) A (B)	4 (12) 2 (14)	A (B) A (B)
9. Hillcrest Avenue at Prewett Ranch Drive	Signal	AM PM	31 16	C B	32 16	C B
10. Deer Valley Road at Prewett Ranch Drive	Signal	AM PM	**62** 26	**E** C	***63*** 28	***E*** C
11. Deer Valley Road at Lone Tree Way	Signal	AM PM	44 45	D D	46 51	D D

Notes:
Bold text indicates potentially unacceptable intersection operations. ***Bold italics*** indicates a noticeable effect on operations and potential violations of City LOS policies.
1 Signal = Signalized intersection; SSSC = Side-street stop-controlled intersections; traffic on main street does not stop while traffic on the side-street is controlled by a stop sign.
2 Average intersection delay is calculated for all signalized intersections using the HCM 6th method for vehicles.
3 For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.

Source: Fehr & Peers, 2022.

In addition, the proposed project would be required to implement the following Conditions of Approval:

- **Lone Tree Way at Hillcrest Avenue -** Implement improvements that would improve operations to LOS D within the existing right-of-way, which could include modifying the eastbound approach to provide two left-turn lanes, two through lanes and a through-right-shared lane through the reconstruction of the median, restriping, and signal modifications. The outside curbs may need to be modified to provide for appropriate lane-alignments. A reimbursement agreement could be established with the City of Antioch to collect proportionate shares from other developments that would benefit from this improvement.

- **Sand Creek Road at SR 4 Eastbound Ramps -** The project should pay their proportionate share of the improvements that would improve operations through participation in the ECCRFFA regional fee program. Planned improvements include construction of a slip-ramp for the eastbound Sand Creek to southbound SR 4 movement, eliminating the conflicting left-turn movement at the intersection.

Implementation of the above Conditions of Approval would ensure that the proposed project would not result in a substantial contribution to cumulative traffic impacts.

Study Freeway Segments Under Cumulative With Project Conditions

The Cumulative With Project AM and PM peak hour freeway operations are summarized in Table 4.2-13 below.

Table 4.2-13
Freeway LOS – Cumulative With Project

Segment	Direction	Cumulative		Cumulative With Project	
		Volume	Delay Index	Volume	Delay Index
AM Peak Hour					
1. SR 4, north of Lone Tree Way	NB	3,652	1.09	3,652	1.09
	SB	3,998	1.18	3,998	1.18
2. SR 4, north of Sand Creek Road	NB	2,602	1.01	2,602	1.01
	SB	3,478	1.06	3,478	1.06
3. SR 4, north of Balfour Road	NB	2,398	1.00	2,398	1.00
	SB	2,576	1.01	2,576	1.01
4. SR 4, south of Balfour Road	NB	1,432	1.00	1,432	1.00
	SB	1,254	1.00	1,254	1.00
PM Peak Hour					
1. SR 4, north of Lone Tree Way	NB	5,031	2.17	5,031	2.17
	SB	4,595	1.58	4,595	1.58
2. SR 4, north of Sand Creek Road	NB	4,241	1.30	4,241	1.30
	SB	4,085	1.23	4,085	1.23
3. SR 4, north of Balfour Road	NB	2,862	1.01	2,862	1.01
	SB	3,301	1.04	3,301	1.04
4. SR 4, south of Balfour Road	NB	1,768	1.00	1,768	1.00
	SB	2,414	1.00	2,414	1.00
Source: Fehr & Peers, 2022.					

As shown in the table, all study freeway segments would continue to operate within the established service objective (i.e., delay index of 2.5 or less during the peak hours) with the addition of project traffic, accounting for the planned widening of SR 4 between Balfour Road to Marsh Creek Road to provide two lanes in each direction.

Therefore, the proposed project would not conflict with applicable City/CCTA standards for study freeway segments under Cumulative With Project conditions.

5. Statutorily Required Sections

5. STATUTORILY REQUIRED SECTIONS

5.1 INTRODUCTION

The Statutorily Required Sections chapter of the Draft EIR includes discussions regarding those topics that are required to be included in an EIR, pursuant to CEQA Guidelines, Section 15126.2. The chapter includes a discussion of the proposed project's potential to result in growth-inducing impacts; the cumulative setting analyzed in this EIR; significant irreversible environmental changes; and significant and unavoidable impacts caused by the proposed project.

5.2 GROWTH-INDUCING IMPACTS

State CEQA Guidelines section 15126.2(d) requires an EIR to evaluate the potential growth-inducing impacts of a proposed project. Specifically, an EIR must discuss the ways in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Growth can be induced in a number of ways, including the elimination of obstacles to growth, or by encouraging and/or facilitating other activities that could induce growth. Examples of projects likely to have growth-inducing impacts include extensions or expansions of infrastructure systems beyond what is needed to serve project-specific demand, and development of new residential subdivisions or office complexes in areas that are currently only sparsely developed or are undeveloped.

The CEQA Guidelines are clear that while an analysis of growth-inducing effects is required, it should not be assumed that induced growth is necessarily significant or adverse. This analysis examines the following potential growth-inducing impacts related to implementation of the proposed project and assesses whether these effects are significant and adverse (see CEQA Guidelines, Section 15126.2[d]):

1. Foster population and economic growth and construction of housing.
2. Eliminate obstacles to population growth.
3. Affect service levels, facility capacity, or infrastructure demand.
4. Encourage or facilitate other activities that could significantly affect the environment.

Foster Population and Economic Growth and Construction of Housing

As discussed throughout the Initial Study prepared for the proposed project and this EIR, development of the site with 294 single-family units, as well as the future development of a 150-bed assisted living facility, would increase the available housing within the Antioch area, which would be expected to increase population in the area. Using the City's 2015-2023 Housing Element average household size of 3.15 persons per household, and assuming one person per bed for the future 150-bed assisted living facility, the proposed project could provide housing for up to approximately 1,076 people (294 proposed households X 3.15 persons per household + 150 assisted living residents = 1,076 new residents). According to the City of Antioch Housing Element, Antioch's population increased by approximately 4.0 percent between the years 2010 and 2014, from 102,372 residents to 106,455 residents.[1] Contra Costa County's population has increased at a similar pace, growing by approximately 3.6 percent from 2010 to 2014, from

1 City of Antioch. *City of Antioch Housing Element 2015-2023* [pg. 2-2]. Adopted April 14, 2015.

1,049,025 to 1,087,008. Assuming that the proposed project would be fully built out and operating at full capacity, the project's increase in population would represent 1.05 percent of the City's population, and an 0.09 percent increase in the County's population. Such an increase in population would not be considered substantial. In addition, it should be noted that the City of Antioch has previously considered buildout of the project site with residential uses (as well as the Sand Creek Focus Area) as part of the General Plan. Therefore, the proposed project would not result in substantially more intensive population growth beyond what has been previously analyzed for the Sand Creek Focus Area.

Appendix G of CEQA Guidelines has been recently amended to clarify that unplanned population growth would be considered a potentially significant impact. However, growth that is planned, and the environmental effects of which have been analyzed in connection with a land use plan or a regional plan, should not by itself be considered an impact. Because, as discussed above, the proposed project would not result in substantially more intensive population growth beyond what has been previously analyzed for the site, the environmental effects of such growth would not constitute a significant impact. Thus, the economic growth associated with buildout of the site would be reasonably within what has been anticipated by the City. All physical environmental effects of the proposed project, including single-family residential development, the planned assisted living facility and neighborhood commercial development, recreational amenities, and utilities and infrastructure improvements have been addressed throughout this EIR and the Initial Study prepared for the proposed project. Overall, the proposed project would not be expected to generate any new growth-inducing impacts beyond what has been identified within this EIR.

Eliminate Obstacles to Population Growth

The elimination of either physical or regulatory obstacles to growth is considered to be a growth-inducing effect. A physical obstacle to growth typically involves the lack of public service infrastructure. The extension of public service infrastructure, including roadways, water mains, and sewer lines, into areas that are not currently provided with these services, would be expected to support new development. Similarly, the elimination or change to a regulatory obstacle, including existing growth and development policies, could result in new growth.

As discussed in Section XIX, Utilities and Service Systems, of the Initial Study prepared for the proposed project, potable water would be distributed to the project site by an extension of the existing 12-inch Zone III trunk line in Hillcrest Avenue. The existing 12-inch Zone III trunk line would continue south to I Street, planned by the Creekside/Vineyards at Sand Creek Project, and the head west to the project boundary. Additionally, in-tract streets would include water lines that would be looped from the western project boundary up Deer Valley Road to connect to the City's existing water system. The water distribution system improvements planned for in the Water System Master Plan Update and associated Capital Improvement Program (CIP), as well as the infrastructure improvements included in the proposed project, would be capable of accommodating the increased demand for water supplies associated with buildout of the proposed project. Sanitary sewer service would be provided by in-tract sewer lines that would connect to I-Street in the Creekside/Vineyards at Sand Creek Project. The Creekside/Vineyards at Sand Creek Project includes a main sewer line that would connect to a planned sewer line in Sand Creek Road.

Primary access to the proposed project would be provided by a new on-site roadway connecting to the planned Hillcrest Avenue extension east of the site. The connection to Hillcrest Avenue is contingent upon construction of the Creekside/Vineyards at Sand Creek Project. In the event that the Creekside/Vineyards at Sand Creek Project is not constructed, access to the proposed project may be provided by an alternate roadway connecting the northern portion of the project site to the future Sand Creek Road included as an Irrevocable Offer of Dedication (IOD) as part of the Aviano Project. An emergency vehicle access (EVA) only roadway would provide secondary access from Deer Valley Road to the western portion of the project site. The EVA would follow the existing alignment of the unimproved private access road over a culvert.

The primary infrastructure systems included as part of the proposed project would be sized based on the growth anticipated for the Sand Creek Focus Area per the City's General Plan and the City's utility master plans. All infrastructure improvements proposed for the project area were reviewed and approved by the City of Antioch Public Works Department and would be financed by the project applicant. Because the surrounding area would experience population growth with or without the proposed project, the extension of utilities and construction of roadways to the project site would not be considered the elimination of an obstacle to population growth.

Affect Service Levels, Facility Capacity, or Infrastructure Demand

Increases in population that would occur as a result of a proposed project may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental impacts. As discussed in the Initial Study prepared for the proposed project, the proposed project would increase demands for fire and police protection services. The proposed project would be required to pay applicable fire protection fees, as well as Development Impact Fees for police facilities, in compliance with Section 9-3.50 of the City Municipal Code. Additionally, the City would require the project applicant to participate in or assist in the formation of a Community Facilities District (CFD) to fund the incremental increase in demand for fire protection, ambulance services, and police protection associated with the proposed project. Payment of the applicable fees would guarantee that the proposed project would not necessitate the construction of new Contra Costa County Fire Protection District (CCCFPD) or Antioch Police Department (APD) facilities. Therefore, impacts related to the need for new or physically altered fire protection and police protection facilities, the construction of which could cause significant environmental impacts, were determined to be less than significant in the Initial Study.

In addition, as discussed in Section XIX, Utilities and Service Systems, of the Initial Study, wastewater generated by the proposed project could be accommodated by existing wastewater treatment facilities and infrastructure, and sufficient water supplies would be available to server the proposed project and reasonably foreseeable future development. Furthermore, the proposed project would include on-site detention and bio-retention facilities sized to exceed the minimum volume requirement necessary to adequately manage all runoff from the proposed impervious surfaces. Thus, the project would not require new or expanded off-site stormwater infrastructure. The landfill that would serve the proposed project has adequate capacity to manage the solid waste generated as result of the project.

Therefore, the proposed project would not increase population such that service levels, facility capacity, and/or infrastructure demand would require construction of new facilities that could cause significant environmental impacts.

Encourage or Facilitate other Activities That Could Significantly Affect the Environment

This EIR and the Initial Study prepared for the proposed project provide a comprehensive assessment of the potential for environmental impacts associated with implementation of the proposed project. Please refer to Chapters 4.1 and 4.2 of this EIR, as well as the attached Initial Study, which comprehensively address the potential for impacts from urban development on the project site.

5.3 CUMULATIVE IMPACTS

CEQA Guidelines, Section 15130 requires that an EIR discuss the cumulative and long-term effects of the proposed project that adversely affect the environment. “Cumulative impacts” are defined as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts” (CEQA Guidelines, Section 15355). “[I]ndividual effects may be changes resulting from a single project or a number of separate projects” (CEQA Guidelines, Section 15355, subd. [a]). “The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time” (CEQA Guidelines, Section 15355, subd. [b]).

The need for cumulative impact assessment reflects the fact that, although a project may cause an “individually limited” or “individually minor” incremental impact that, by itself, is not significant, the increment may be “cumulatively considerable,” and, thus, significant, when viewed together with environmental changes anticipated from past, present, and probable future projects (CEQA Guidelines, Section 15064, subd. [h(1)], Section 15065, subd. [c], and Section 15355, subd. [b]). Accordingly, particular impacts may be less than significant on a project-specific basis but significant on a cumulative basis if their small incremental contribution, viewed against the larger backdrop, is cumulatively considerable. However, it should be noted that CEQA Guidelines, Section 15064, Subdivision (h)(5) states, “[…]the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project’s incremental effects are cumulatively considerable.” Therefore, even where cumulative impacts are significant, any level of incremental contribution is not necessarily deemed cumulatively considerable.

Section 15130(b) of CEQA Guidelines indicates that the level of detail of the cumulative analysis need not be as great as for the project impact analyses, but that analysis should reflect the severity of the impacts and their likelihood of occurrence, and that the analysis should be focused, practical, and reasonable. To be adequate, a discussion of cumulative effects must include the following elements:

> (1) Either (a) a list of past, present and probable future projects, including, if necessary, those outside the agency’s control, or (b) a summary of projections contained in an adopted general plan or related planning document, or in a prior certified EIR, which described or evaluated regional or area-wide conditions contributing to the cumulative impact, provide that such documents are reference and made available for public inspection at a specified location;
>
> (2) A summary of the individual projects’ environmental effects, with specific reference to additional information and stating where such information is available; and
>
> (3) A reasonable analysis of all of the relevant projects’ cumulative impacts, with an examination of reasonable, feasible options for mitigating or avoiding the project’s contribution to such effects (Section 15130[b]).

For some projects, the only feasible mitigation measures will involve the adoption of ordinances or regulations, rather than the imposition of conditions on a project-by-project basis (Section 15130[c]). Section 15130(a)(3) states that an EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable, and thus not significant, if a project is required to implement or fund the project's fair share of a mitigation measure or measures designed to alleviate the cumulative impact.

A discussion of cumulative impacts is provided within each of the technical chapters of this EIR pursuant to CEQA Guidelines Section 15130.

Cumulative Setting

The lead agency should define the relevant geographic area of inquiry for each impact category (id., Section 15130, subd. [b][3]), and should then identify the universe of "past, present, and probable future projects producing related or cumulative impacts" relevant to the various categories, either through the preparation of a "list" of such projects or through the use of "a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact" (id., subd. [b][1]).

Limited situations exist where the geographic setting differs for the various resource areas. For example, the cumulative geographic setting for air quality is the San Francisco Bay Area Air Basin (SFBAAB), which is the air basin that the proposed project is located within. Global climate change is, by nature, a cumulative impact. Emissions of greenhouse gases (GHG) contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change (e.g., sea level rise, impacts to water supply and water quality, public health impacts, impacts to ecosystems, impacts to agriculture, and other environmental impacts). A single project could not generate enough GHG emissions to contribute noticeably to a change in the global average temperature. However, the combination of GHG emissions from a project in combination with other past, present, and future projects could contribute substantially to the world-wide phenomenon of global climate change and the associated environmental impacts. Although the geographical context for global climate change is the Earth, for analysis purposes under CEQA, and due to the regulatory context pertaining to GHG emissions and global climate change applicable to the proposed project, the geographical context for global climate change in this EIR is limited to the State of California.

As discussed in Chapter 4.2, Transportation, of this EIR, the cumulative traffic analysis relied on the Contra Costa Transportation Authority (CCTA) Travel Demand Model, traffic growth trends as described in both the Antioch and Brentwood General Plan EIR, future traffic projections as documented in the administrative draft Antioch Transportation Impact Fee, future projections from the City of Brentwood Priority Area 1 Specific Plan EIR (June 2018), and projections developed as part of the Aviano and Promenade/Vineyards at Sand Creek transportation impact studies. Traffic forecasts within the immediate study area, using the expected conditions in 2040, were reviewed to ensure that known developments were adequately reflected in the forecasts, such as the Bridle Gate project located in the City of Brentwood on the north and south side of the proposed Sand Creek extensions, west of SR 4.

Cumulative impacts are analyzed in each of the technical chapters of this EIR, where the specific cumulative setting for each resource area is presented along with the cumulative impact discussion in the relevant resource area section of the EIR.

5.4 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Per CEQA Guidelines Section 15126.2(c), this EIR is required to include consideration of significant irreversible environmental changes that would be caused by the proposed project, should the project be implemented. An impact would be determined to be a significant and irreversible change in the environment if:

- Buildout of the project area could involve a large commitment of nonrenewable resources;
- The primary and secondary impacts of development could generally commit future generations to similar uses (e.g., a highway provides access to a previously remote area);
- Development of the proposed project could involve uses in which irreversible damage could result from any potential environmental accidents associated with the project; or
- The phasing and eventual development of the project could result in an unjustified consumption of resources (e.g., the wasteful use of energy).

The proposed project would likely result in, or contribute to, the following significant irreversible environmental changes:

- Conversion of vacant land to a fully built-out residential community, including commercial uses, thus precluding alternative land uses for that portion of the site in the future;
- Placement and/or extension of roadways in areas providing access to the proposed project and connecting to adjacent developments;
- Irreversible consumption of goods and services, such as fire, police, and school services, associated with the future population; and
- Irreversible consumption of energy and natural resources, such as water, electricity, and natural gas, associated with the future residents.

5.5 SIGNIFICANT AND UNAVOIDABLE IMPACTS

According to CEQA Guidelines, an EIR must include a description of those impacts identified as significant and unavoidable should the proposed action be implemented (CEQA Guidelines §15126.2[b]). Such impacts would be considered unavoidable when the determination is made that either mitigation is not feasible or only partial mitigation is feasible such that the impact is not reduced to a level that is less-than-significant.

Based on the analysis provided in Chapters 4.1 and 4.2 of this EIR, the below listed impacts were determined to be significant and unavoidable. All other impacts identified in this EIR could be eliminated or reduced to a less-than-significant level by mitigations imposed by the City. The final determination of the significance of impacts and the feasibility of mitigation measures would be made by the City as part of the City's certification action.

4.1-6 Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

4.2-6 Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).

6. Alternatives Analysis

6. ALTERNATIVES ANALYSIS

6.1 INTRODUCTION

The Alternatives Analysis chapter of the EIR includes consideration and discussion of a range of reasonable alternatives to the proposed project, as required per CEQA Guidelines Section 15126.6. Generally, the chapter includes discussions of the following: the purpose of an alternatives analysis; alternatives considered but dismissed; reasonable range of project alternatives and their associated impacts in comparison to the proposed project's impacts; and the environmentally superior alternative.

6.2 PURPOSE OF ALTERNATIVES

The primary intent of the alternatives evaluation in an EIR, as stated in Section 15126.6(a) of the CEQA Guidelines, is to "[…] describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." In the context of CEQA Guidelines Section 21061.1, "feasible" is defined as:

> ...capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors.

Section 15126.6(f) of CEQA Guidelines states, "The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice." Section 15126.6(f) of CEQA Guidelines further states:

> The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determined could feasibly attain most of the basic objectives of the project.

In addition, an EIR is not required to analyze alternatives when the effects of the alternative "cannot be reasonably ascertained and whose implementation is remote and speculative."

The CEQA Guidelines provide the following guidance for discussing alternatives to a proposed project:

- An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives (CEQA Guidelines Section 15126.6[a]).
- Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these

alternatives would impede to some degree the attainment of the project objectives, or would be more costly (CEQA Guidelines Section 15126.6[b]).

- The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination […] Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts (CEQA Guidelines Section 15126.6[c]).
- The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison (CEQA Guidelines Section 15126.6[d]).
- If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed (CEQA Guidelines Section 15126.6[d]).
- The specific alternative of "no project" shall also be evaluated along with its impact. The purpose of describing and analyzing a no project alternative is to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The no project alternative analysis is not the baseline for determining whether the proposed project's environmental impacts may be significant, unless it is identical to the existing environmental setting analysis which does establish that baseline (CEQA Guidelines Section 15126.6[e][1]).
- If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives (CEQA Guidelines Section 15126.6[e][2]).

Project Objectives

Based on the above, reasonable alternatives to the project must be capable of feasibly attaining most of the basic objectives of the project. The proposed project is being pursued with the following objectives, as stated by the applicant:

1. To create the only intentionally designed multi-generational community in the east Bay Area with active adult seniors that may age-in-place in the same neighborhood as traditional family homes.
2. To maximize the opportunity for development of housing and help the City of Antioch provide its fair share of housing, and help alleviate a regional housing shortage, by providing a mix of housing types and sizes, some moderately affordable, and that can meet the needs of a variety of different and growing household sizes.
3. To provide onsite amenities, such as parks space, a clubhouse, and recreational and social opportunities for residents.
4. To permanently protect nearly 50% of the project site as undeveloped open space.
5. To create public meeting places and pedestrian trails and exercise opportunities throughout the site with connections between new open space amenities including preserved areas of Sand Creek and planned City facilities, including the Sports Complex.
6. To implement the County's Growth Management Program by providing for urban development within the Urban Limit Line.

7. To contribute to the City of Antioch's economic and social viability by creating a community that attracts investment and positive attention by adding residents who tend to shop locally, maintain high volunteerism, and travel less frequently during peak traffic hours.
8. To provide for various infrastructure improvements that would benefit the community, including the extension of Hillcrest Avenue in conjunction with Subdivision 9501, public roadway improvements to serve the project, extension of utilities within those roadways, and drainage facilities to appropriately collect and convey storm water runoff to designated detention basins.
9. To create, preserve, and maintain open space and critical biological habitat on- and off-site so as to responsibly address the environmental sensitivity of the site.
10. To create an economically viable project that provides a fair share contribution of infrastructure to the community through payment of fees, and/or land-based financing, and/or construction of required capital improvements, while providing a well-designed community of the type and style desired by current and future active adult citizens and families of Antioch and the greater Bay Area.

Impacts Identified in the EIR

In addition to attaining the majority of project objectives, reasonable alternatives to the project must be capable of reducing the magnitude of, or avoiding, identified significant environmental impacts of the proposed project. The significance level of impacts identified in the EIR are presented below.

Significant and Unavoidable

Impacts of the proposed project that have been determined to remain significant and unavoidable, even after implementation of the feasible mitigation measures set forth in this EIR, include the following:

- ***Air Quality and Greenhouse Gas (GHG) Emissions:*** The EIR determined that implementation of the proposed project could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. As discussed below, because feasible mitigation to reduce the per capita vehicle miles travelled (VMT) associated with the proposed project to less than 15 percent below regional averages does not exist even with implementation of Mitigation Measures 4.1-6(a) and 4.1-6(b), the project would not comply with the Bay Area Air Quality Management District's (BAAQMD) Transportation standard c. Consequently, the project's incremental contribution to the cumulatively significant effects of GHG emissions and global climate change would remain cumulatively considerable and significant and unavoidable.

- ***Transportation:*** The proposed project would result in per-capita VMT that would exceed regional averages and, thus, would not comply with the Office of Planning and Research's (OPR) suggested threshold for residential project VMT of 15 percent less than the existing City or regional average. Because feasible mitigation to reduce the per capita VMT associated with the proposed project to less than 15 percent below regional averages does not exist, the proposed project could conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b), and the impact would remain significant and unavoidable.

Less Than Significant with Mitigation

Significant environmental impacts of the proposed project that have been identified as requiring mitigation measures to ensure that the level of significance is ultimately less than significant include the following:

- ***Air Quality and Greenhouse Gas Emissions:*** The EIR determined that implementation of the proposed project could conflict with or obstruct implementation of the applicable air quality plan during project construction (e.g., related to NO_X emissions). In addition, the EIR determined that the proposed project could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. The EIR requires mitigation in order to ensure that the impacts are reduced to less-than-significant levels.

- ***Transportation:*** The EIR determined that implementation of the proposed project could conflict with a program, plan, ordinance, or policy addressing the circulation system during construction activities, and could conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. However, the EIR requires mitigation in order to ensure that the impacts are reduced to less-than-significant levels.

Less Than Significant or No Impact

As discussed in Chapter 4.1, Air Quality and Greenhouse Gas Emissions, and Chapter 4.2, Transportation, within this EIR, the proposed project would result in no impact or a less-than-significant impact related to the following topics associated with the resource areas indicated:

- ***Air Quality***
  - Conflict with or obstruct implementation of the applicable air quality plan during project operation.
  - Expose sensitive receptors to substantial pollutant concentrations.
  - Result in other emissions (such as those leading to odors) affecting a substantial number of people.
  - Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

- ***Transportation***
  - Substantially increase hazards to vehicle safety due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
  - Result in inadequate emergency access.

The Initial Study prepared for the proposed project during the scoping period (see Appendix A) includes a detailed environmental checklist addressing a range of technical environmental issues. For each technical environmental issue, the Initial Study identifies the level of impact for the proposed project. The Initial Study identifies the environmental effects as either "no impact," "less-than-significant," "less-than-significant with mitigation incorporated," or "potentially significant." Impacts identified for the proposed project in the Initial Study as "no impact," "less-than-significant," or "less-than-significant with mitigation incorporated" are listed below, and summarized further in Chapter 4.0, Introduction to the Analysis, of this EIR.

- Aesthetics (All Items);
- Agriculture and Forest Resources (All Items);
- Biological Resources (All Items);
- Cultural Resources (All Items);
- Energy (All Items);
- Geology and Soils (All Items);
- Hazards and Hazardous Materials (All Items);
- Hydrology and Water Quality (All Items);
- Land Use and Planning (All items);
- Mineral Resources (All Items);
- Noise (All Items);
- Population and Housing (All Items);
- Public Services (All Items);
- Recreation (All Items);
- Tribal Cultural Resources (All Items);
- Utilities and Service Systems (All Items); and
- Wildfire (All Items).

The alternatives discussed herein have been chosen based on feasibility to meet project objectives, as well as the ability to reduce potential impacts analyzed within this EIR. Impacts identified and fully-mitigated in the Initial Study prepared for the proposed project would be similar or fewer for all of the alternatives included in this chapter. Accordingly, topics dismissed within the Initial Study prepared for the proposed project are not specifically addressed within the sections below.

6.3 SELECTION OF ALTERNATIVES

The requirement that an EIR evaluate alternatives to the proposed project or alternatives to the location of the proposed project is a broad one; the primary intent of the alternatives analysis is to disclose other ways that the objectives of the project could be attained, while reducing the magnitude of, or avoiding, one or more of the environmental impacts of the proposed project. Alternatives that are included and evaluated in the EIR must be feasible alternatives. However, the CEQA Guidelines require the EIR to "set forth only those alternatives necessary to permit a reasoned choice." As stated in Section 15126.6(a), an EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. The CEQA Guidelines provide a definition for "a range of reasonable alternatives" and thus limit the number and type of alternatives that may need to be evaluated in a given EIR. According to the CEQA Guidelines Section 15126.6(f):

> The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determined could feasibly attain most of the basic objectives of the project.

First and foremost, alternatives in an EIR must be feasible. In the context of CEQA Guidelines Section 21061.1, "feasible" is defined as:

> ...capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors.

Finally, an EIR is not required to analyze alternatives when the effects of the alternative "cannot be reasonably ascertained and whose implementation is remote and speculative."

Alternatives Considered But Dismissed From Further Analysis

Consistent with CEQA, primary consideration was given to alternatives that could reduce significant impacts, while still meeting most of the basic project objectives.

As stated in Guidelines Section 15126.6(c), among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are:

(i) failure to meet most of the basic project objectives,
(ii) infeasibility, or
(iii) inability to avoid significant environmental impacts.

Regarding item (ii), infeasibility, among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives.

Off-Site Alternative

As noted previously, the purpose of an alternatives analysis is to develop alternatives to the proposed project that substantially lessen at least one of the significant environmental effects identified as a result of the project, while still meeting most, if not all, of the basic project objectives. Development of the proposed project at an off-site location would not be capable of meeting a portion of the project objectives due to a number of the project objectives being specific to the project site size and location. Other locations that are designated Medium Low Density Residential/Open Space and Commercial/Open Space exist within the City of Antioch; however, the alternative locations consist of existing development. In addition, Project Objective #8 establishes the goal of providing for various infrastructure improvements that would benefit the community, including the extension of Hillcrest Avenue in conjunction with Subdivision 9501, public roadway improvements to serve the project, extension of utilities within those roadways, and drainage facilities to appropriately collect and convey storm water runoff to designated detention basins. Because alternative locations designated Medium Low Density and Commercial do not exist within the Sand Creek Focus Area, the Alternative site would not meet Project Objective #8. Project Objective #5 aims to create public meeting places and pedestrian trails and exercise opportunities throughout the site with connections between new open space amenities including preserved areas of Sand Creek and planned City facilities, including the Sports Complex. Construction of the project at a different location would not include connection from the preserved areas of Sand Creek to the Sports Complex, and, thus, Project Objective #5 could not be fully met.

Furthermore, The CEQA Guidelines (Section 15126.6[b]) requires that only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR. The Off-Site Alternative would involve the construction of the proposed project on an alternative location. The Off-Site Alternative would have the same type and intensity of uses as the proposed project. The majority of other areas designated Medium Low Density and Commercial are located near existing development. Given the proximity to existing residences, development of the Off-site Alternative would likely result in greater impacts than the proposed project related to air quality, GHG emissions, and noise. Development of an Off-Site Alternative would be expected to result in at least the same, if not greater, level of impacts related to transportation as compared to the proposed project. Furthermore, the Applicant does not own an alternative location that would be adequate to construct the proposed project.

It is also important to consider that the project site is located adjacent to other proposed and approved projects in the City of Antioch, as well as existing and planned urban areas within the City of Brentwood. Overall, a feasible off-site location that would meet the requirements of CEQA, as well as meet the basic objectives of the proposed project, does not exist. Therefore, an Off-Site Alternative was dismissed from detailed analysis within this EIR.

6.4 ALTERNATIVES CONSIDERED IN THIS EIR

The following alternatives are considered and evaluated in this section:

- No Project (No Build) Alternative;
- Buildout Pursuant to Existing Land Use Designations Alternative;
- Reduced Density Alternative; and
- Reduced Footprint Alternative.

Each of the project alternatives is described in detail below, with a corresponding analysis of each Alternative's impacts in comparison to the proposed project. While an effort has been made to include quantitative data for certain analytical topics, where possible, qualitative comparisons of the various alternatives to the project are primarily provided. Such an approach to the analysis is appropriate as evidenced by CEQA Guidelines Section 15126.6[d], which states that the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed.

The analysis evaluates impacts that would occur with the alternatives relative to the significant impacts identified for the proposed project. When comparing the potential impacts resulting from implementation of the foregoing alternatives, the following terminology is used:

- "Fewer" = Less than Proposed Project;
- "Similar" = Similar to Proposed Project; and
- "Greater" = Greater than Proposed Project.

When the term "fewer" is used, the reader should not necessarily equate this to elimination of significant impacts identified for the proposed project. For example, in many cases, an alternative would reduce the relative intensity of a significant impact identified for the proposed project, but the impact would still be expected to remain significant under the alternative, thereby requiring mitigation. In other cases, the use of the term "fewer" may mean the actual elimination of an impact identified for the proposed project altogether. Similarly, use of the term "greater" does not necessarily imply that an alternative would require additional mitigation beyond what has been required for the proposed project. To the extent possible, this analysis will distinguish between the two implications of the comparative words "fewer" and "greater".

A comparison of the environmental impacts resulting from the considered alternatives and the proposed project is provided in Table 6-6.

No Project (No Build) Alternative

CEQA requires the evaluation of the comparative impacts of the "No Project" alternative (CEQA Guidelines Section 15126.6[e]). Analysis of the no project alternative shall:

> "… discuss […] existing conditions […] as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services." (*Id.*, subd. [e][2])

In addition:

> "[i]f the project is other than a land use or regulatory plan, for example a development project on identifiable property, the 'no project' alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in the property's existing state against environmental effects which would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this 'no project' consequence should be discussed. In certain instances, the no project alternative means 'no build,' wherein the existing environmental setting is maintained. However, where failure to proceed with the project would not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment." (*Id.*, subd. [e][3][B]).

The No Project (No Build) Alternative is defined as the continuation of the existing conditions of the project site, which currently consists primarily of ruderal grasses and is absent of structures. The No Project (No Build) Alternative would not require grading or ground disturbance within the project site. However, the City's General Plan identifies the site as an area suitable for development. The No Project (No Build) Alternative would not fulfill the stated aims of the City's General Plan or the project's objectives.

Air Quality and Greenhouse Gas Emissions

Because the No Project (No Build) Alternative would not involve construction activities, the Alternative would not result in any construction emissions. In addition, the Alternative would not result in any operational emissions of criteria pollutants or GHGs. Thus, the impacts identified for the proposed project related to air quality and GHG emissions would not occur under the No Project (No Build) Alternative, and Mitigation Measures 4.1-1, 4.1-6(a) and 4.1-6(b) would not be required. Overall, no impacts related to air quality and GHG emissions would occur under the No Project (No Build) Alternative.

Transportation

The No Project (No Build) Alternative would not generate construction traffic on local roadways and, thus, Mitigation Measure 4.2-1 related to preparation of a construction management plan would not be required. In addition, the Alternative would not result in any development and, thus, would not increase traffic in the project area. Accordingly, the Alternative would not result in any of the impacts identified for the proposed project associated with project operations and Mitigation Measures 4.2-2, 4.2-3(a), and 4.2-3(b) would not be required. Overall, no impacts related to transportation would occur under the No Project (No Build) Alternative.

Buildout Pursuant to Existing Land Use Designations Alternative

The No Project (No Build) Alternative discussed above would be considered a “no build” alternative, wherein the existing environmental setting is maintained. However, failure to proceed with the proposed project would not necessarily result in the preservation of the existing environmental conditions, but would rather result in the future buildout of the site pursuant to existing City planning documents. As such, the Buildout Pursuant to Existing Land Use Designations Alternative would be considered another type of “no project” alternative.

The Buildout Pursuant to Existing Land Use Designations Alternative would consist of buildout of the project site per the current City of Antioch General Plan land use designations at the maximum allowable densities. Per the City’s General Plan, the majority of the site is designated Hillside, Estate and Executive Residential/Open Space, while the western portion of the site, alongside Deer Valley Road, is designated Commercial/Open Space. It should be noted that the project site contains substantial constraints to development, such as excessive slopes and the Sand Creek corridor. Although the site contains the foregoing development constraints, should the applicant find a solution to those constraints, the Alternative would be a viable option. Thus, in order to provide a more accurate comparison of impacts to the proposed project, the Alternative has been included in this EIR. Other alternatives within this chapter reflect development of the site with respect to the existing constraints.

Based on the maximum allowable density for the Hillside, Estate and Executive Residential/Open Space land use designation of 2.0 dwelling units per acre (du/ac), the Alternative would result in a maximum of approximately 127 single-family housing units. For this analysis, the 3.0 acres designated as Commercial/Open Space, were assumed to be developed at a floor-area-ratio (FAR) of 0.5 for a total of 65,340 square feet (sf) of commercial uses to be developed on-site. In addition, the assumption was made that the Alternative would generally include the development of the same amount of streets (13.2 acres) as compared to the proposed project. Similar to the proposed project, the remaining land on-site is assumed to be retained as parks, recreational land, and open space.

Because the Buildout Pursuant to Existing Land Use Designations Alternative would not include a mix of housing types, including senior housing, the Alternative would not be capable of meeting Project Objective #1. However, because the Alternative would include the development of a mix of both housing and commercial uses within the Sand Creek Focus Area as well as associated infrastructure improvements, the remaining project objectives would be fully or partially met.

Air Quality and Greenhouse Gas Emissions

Under the Buildout Pursuant to Existing Land Use Designations Alternative, a total of 63.7 acres of the project site would be developed with 127 units. In addition, 65,340 sf of commercial uses would be developed on 3.0 acres, and 13.2 acres of streets would be developed. The remaining portions of the site would be retained as open space.

The Reduced Density Alternative would decrease the total number of dwelling units constructed on the project site compared to the proposed project. Because the Reduced Density Alternative would involve fewer homes and future residents, emissions associated with vehicle trips, as well as area and energy sources, would decrease from that of the proposed project.

However, considering that the Alternative would result in a greater amount of land disturbed and graded, construction emissions under the Buildout Pursuant to Existing Land Use Designations

Alternative were quantified to compare to BAAQMD's thresholds for emissions, as well as the proposed project (see Table 6-1). As shown in Table 6-1, the unmitigated construction emissions of criteria air pollutants associated with the Buildout Pursuant to Existing Land Use Designations Alternative would still exceed the BAAQMD's pounds per day (lbs/day) threshold for NO_X. Because emissions of the Buildout Pursuant to Existing Land Use Designations Alternative would exceed the BAAQMD's thresholds, Mitigation Measure 4.1-1 would still be required in order to reduce the impact.

Table 6-1
Buildout Pursuant to Existing Land Use Designations Alternative Unmitigated Construction Emissions (lbs/day)

	ROG	NO_X	PM_{10}	$PM_{2.5}$
Project Unmitigated Emissions	15.96	75.63	1.68	1.56
Alternative Emissions	5.27	75.63	1.68	1.56
BAAQMD Thresholds	54	54	82	54
Emissions Exceed Thresholds?	**NO**	**YES**	**NO**	**NO**
Source: CalEEMod, July 2022 (see Appendix E).				

With regard to GHG emissions associated with the Buildout Pursuant to Existing Land Use Designations Alternative, as discussed in Chapter 4.1, Air Quality, of this EIR, because feasible mitigation to reduce the per capita VMT to less than 15 percent below regional averages does not exist, even with implementation of Mitigation Measures 4.1-6(a) and 4.1-6(b), the project would not comply with the BAAQMD's Transportation standard c. Considering the City's VMT threshold is a function of VMT per capita, a reduction in the number of residents would correspond with a reduction in total VMT and, thus, result in an equivalent rate of VMT per capita. Consequently, the Buildout Pursuant to Existing Land Use Designations Alternative would result in similar impacts related to the emission of GHGs as compared to the proposed project, and impacts would remain significant and unavoidable.

Based on the above, impacts related to air quality and GHG emissions would be similar with implementation of the Buildout Pursuant to Existing Land Use Designations Alternative compared to the proposed project.

Transportation

Similar to the proposed project, the Buildout Pursuant to Existing Land Use Designations Alternative would add construction vehicle traffic to area roadways, thereby potentially conflicting with existing traffic patterns. As such, Mitigation Measure 4.2-1 related to preparation of a construction management plan would still be required. In addition, because the Alternative would involve 63.7 acres of residential development, as compared to 31.2 acres under the proposed project, the overall duration of construction traffic, and associated impacts, would be greater.

Based on the vehicle trip generation rates provided in the Transportation Impact Assessment prepared for the proposed project by Fehr & Peers (see Appendix D),[1] the Buildout Pursuant to Existing Land Use Designations Alternative would result in approximately 3,666 average daily trips (ADT) during operations, as compared to 4,732 ADT occurring with development of 300 single-family units assumed for the proposed project (see Table 6-2).

1 Fehr & Peers. *Transportation Impact Assessment, Albers Ranch.* March 2022.

Table 6-2
Buildout Pursuant to Existing Land Use Designations Trip Generation

Land Use	Unit/Quantity	Daily Trip Generation
Project Trip Generation		
Single-Family Detached Housing[1]	300 Dwelling Units	2,832
Assisted Living[2]	150 Beds	390
Neighborhood Commerical[3]	40,000 SF	1,510
	Total Project Trips	***4,732***
Alternative Trip Generation		
Single-Family Detached Housing[1]	127 Dwelling Units	1,199
Neighborhood Commerical[3]	65,340 SF	2,467
	Total Project Trips	***3,666***

Notes:
[1] ITE land use category 210 – Single-Family Homes (Adj Streets, 7-9A, 4-6P):
Daily: (T) = 9.44 (X)
[2] ITE land use category 254 – Assisted Living (Adj Streets, 7-9A, 4-6P):
Daily: (T) = 2.60(X)
[3] ITE land use category 820 – Shopping Center (Adj. Streets, 7-9A, 4-6P)
Daily: (T) = 37.75(X)

Source: Fehr & Peers, 2022.

As such, the Alternative would result in fewer trips compared to the proposed project. However, the Alternative would still result in additional trips on the surrounding roadways. In order to conclusively determine whether the additional traffic associated with the Alternative would conflict with applicable City/CCTA standards, a detailed traffic impact study would be required.

Considering the City's VMT threshold is a function of VMT per capita, a reduction in the number of residents would correspond with a reduction in total VMT and, thus, result in an equivalent rate of VMT per capita. However, total project-generated VMT would be reduced by reducing the number of proposed units. Because the City's VMT threshold is a per capita rate, the Alternative's reduced intensity of units would not avoid the project's potential to exceed the City's VMT threshold. The alternative would still require Mitigation Measures 4.2-3(a), 4.2-3(b). However, total project-generated VMT would be reduced and, consequently, the Alternative's impacts related to transportation would be fewer as compared to the proposed project. Nonetheless, although impacts related to transportation would be fewer, the Buildout Pursuant to Existing Land Use Designations Alternative would not eliminate the significant and unavoidable impact related to the City's VMT threshold.

Overall, development of the Buildout Pursuant to Existing Land Use Designations Alternative would result in fewer impacts related to transportation compared to the proposed project.

Reduced Density Alternative

The Reduced Density Alternative would consist of buildout of the project site with half as many residences as the proposed project. As such, the Alternative would develop 147 single-family residential units. The total disturbance area would be identical to the proposed project. Similar to the proposed project, the Alternative would include future development of an assisted living facility and neighborhood commercial development on 3.0 acres, 13.2 acres of streets, and 49.1 acres of parks/open space/recreational/water quality uses. Off-site improvements would also be identical to the proposed project.

Because the Reduced Density Alternative would include a mix of housing types, including senior housing, within the Sand Creek Focus Area as well as associated infrastructure improvements, all of the project objectives would be fully or partially met under the Alternative.

Air Quality and Greenhouse Gas Emissions

Under the Reduced Density Alternative, a total of 147 residential units would be developed on 31.2 acres of the project site. The 147 units would equate to an overall decrease in units, but the disturbance area would remain the same as would occur with the proposed project. Because the Alternative would result in fewer residential units, emissions from the construction of buildings would likely be reduced. However, because grading of the site would continue to disturb the same 31.2 acres of the site as would be disturbed under the proposed project, and considering that grading is often the most emissions intensive phase of construction, the potential exists for construction emissions to exceed the applicable BAAQMD thresholds. As such, construction emissions under the Reduced Density Alternative were quantified to compare to BAAQMD's thresholds for emissions, as well as the proposed project (see Table 6-1).

As shown in Table 6-1, the unmitigated construction emissions of criteria air pollutants associated with the Reduced Density Alternative would exceed the BAAQMD's lbs/day threshold for NO_x. Because emissions of the Reduced Density Alternative would exceed the BAAQMD's thresholds, Mitigation Measure 4.1-1 would still be required in order to reduce the impact.

Table 6-3
Reduced Density Alternative Unmitigated Construction Emissions (lbs/day)

	ROG	NO_X	PM_{10}	$PM_{2.5}$
Project Unmitigated Emissions	15.96	75.63	1.68	1.56
Alternative Emissions	11.67	75.63	1.68	1.56
BAAQMD Thresholds	54	54	82	54
Emissions Exceed Thresholds?	**NO**	**YES**	**NO**	**NO**

Source: CalEEMod, July 2022 (see Appendix E).

With regard to GHG emissions associated with the Reduced Density Alternative, as discussed in Chapter 4.1, Air Quality, of this EIR, because feasible mitigation to reduce the per capita VMT to less than 15 percent below regional averages does not exist, even with implementation of Mitigation Measures 4.1-6(a) and 4.1-6(b), the project would not comply with the BAAQMD's Transportation standard c. Considering the City's VMT threshold is a function of VMT per capita, a reduction in the number of residents would correspond with a reduction in total VMT and, thus, result in an equivalent rate of VMT per capita. Consequently, the Reduced Density Alternative would result in similar impacts related to the emission of GHGs as compared to the proposed project, and impacts would remain significant and unavoidable.

Based on the above, impacts related to air quality and GHG emissions would be similar with implementation of the Reduced Density Alternative compared to the proposed project.

Transportation

Because the Reduced Density Alternative would still add construction vehicle traffic to area roadways, a potential conflict with existing traffic patterns could occur. In addition, although the Alternative includes a fewer number of units, the overall area of disturbance would be the same and require the same area of grading during construction. As such, Mitigation Measure 4.2-1 related to preparation of a construction management plan would still be required.

Given that the Reduced Density Alternative would include fewer residential units than the proposed project, operational vehicle trips would be reduced. Based on the vehicle trip generation rates provided in the Transportation Impact Assessment prepared for the proposed project by Fehr & Peers (see Appendix D),[2] the Reduced Density Alternative would result in a maximum of approximately 3,288 ADT during operations (see Table 6-4).

As shown in Table 6-4, the proposed project would result in a maximum of 4,732 ADT. Given that the Reduced Density Alternative would result in a maximum of 3,288 ADT, the Alternative would result in fewer trips than the proposed project during operations. However, the Alternative would still result in additional trips on the surrounding roadways. In order to conclusively determine whether the additional traffic associated with the Alternative would conflict with applicable City/CCTA standards, a detailed traffic impact study would be required.

Table 6-4
Reduced Density Trip Generation

Land Use	Unit/Quantity	Daily Trip Generation
Project Trip Generation		
Single-Family Detached Housing[1]	300 Dwelling Units	2,832
Assisted Living[2]	150 Beds	390
Neighborhood Commerical[3]	40,000 SF	1,510
	Total Project Trips	***4,732***
Alternative Trip Generation		
Single-Family Detached Housing[1]	147 Dwelling Units	1,388
Assisted Living[2]	150 Beds	390
Neighborhood Commerical[3]	40,000 SF	1,510
	Total Project Trips	***3,288***

Notes:
1 ITE land use category 210 – Single-Family Homes (Adj Streets, 7-9A, 4-6P):
Daily: (T) = 9.44 (X)
2 ITE land use category 254 – Assisted Living (Adj Streets, 7-9A, 4-6P):
Daily: (T) = 2.60(X)
3 ITE land use category 820 – Shopping Center (Adj. Streets, 7-9A, 4-6P)
Daily: (T) = 37.75(X)

Source: Fehr & Peers, 2022.

Considering the City's VMT threshold is a function of VMT per capita, a reduction in the number of residents would correspond with a reduction in total VMT and, thus, result in an equivalent rate of VMT per capita. However, total project-generated VMT would be reduced by reducing the number of proposed units. Because the City's VMT threshold is a per capita rate, the Alternative's reduced intensity of units would not avoid the project's potential to exceed the City's VMT threshold. The alternative would still require Mitigation Measures 4.2-3(a), 4.2-3(b). However, total project-generated VMT would be reduced and, consequently, the Alternative's impacts related to transportation would be fewer as compared to the proposed project. Nonetheless, although impacts related to transportation would be fewer, the Reduced Density Alternative would not eliminate the significant and unavoidable impact related to the City's VMT threshold.

2 Fehr & Peers. *Transportation Impact Assessment, Albers Ranch.* March 2022.

Overall, development of the Reduced Density Alternative would result in fewer impacts related to transportation compared to that of the proposed project.

Reduced Footprint Alternative

The topography of the site is defined by two large knolls within the western and northeastern portions of the site. As part of the proposed project, the northeastern knoll is not proposed to be developed; however, the western knoll includes the development of a 7.1-acre park as well as 12.1 acres of single-family residences. Under the Reduced Footprint Alternative, the proposed project would not include development within the western knoll. As such, the disturbance area would be reduced by 19.2 acres. The remaining 12 acres of land would be developed at the maximum density allowed under the Medium Density Residential/Open Space land use designation. As such, the Reduced Footprint Alternative would include the development of 120 single-family residential uses. Similar to the proposed project, the Alternative would include future development of an assisted living facility and neighborhood commercial development on 3.0 acres. However, the amount of streets developed as part of the Alternative would be reduced, and the amount of parks/open space/recreational/water quality uses would be increased as compared to the proposed project. Off-site improvements would be identical to the proposed project.

Because the Reduced Footprint Alternative would include a mix of housing types, including senior housing, within the Sand Creek Focus Area as well as associated infrastructure improvements, all of the project objectives would be fully or partially met under the Alternative.

Air Quality and Greenhouse Gas Emissions

Under the Reduced Footprint Alternative, a total of 120 residential units would be developed on 12 acres of the project site, which would equate to an overall decrease in units as compared to the proposed project. Because the Alternative would result in fewer residential units, emissions from the construction of buildings would likely be reduced. In addition, the area of disturbance would be reduced by 19.2 acres under the Reduced Footprint Alternative. Considering that grading is often the most emissions intensive phase of construction, a reasonable assumption can be made that construction emissions would be reduced under the Reduced Footprint Alternative such that emissions would not exceed the applicable BAAQMD thresholds. As such, implementation of Mitigation Measure 4.1-1 would not be required.

Furthermore, the Reduced Footprint Alternative would decrease the total number of dwelling units constructed on the project site compared to the proposed project. Because the Reduced Footprint Alternative would involve fewer homes and future residents, emissions associated with vehicle trips, as well as area and energy sources, would decrease from that of the proposed project.

With regard to GHG emissions associated with the Reduced Footprint Alternative, as discussed in Chapter 4.1, Air Quality, of this EIR, because feasible mitigation to reduce the per capita VMT to less than 15 percent below regional averages does not exist, even with implementation of Mitigation Measures 4.1-6(a) and 4.1-6(b), the project would not comply with the BAAQMD's Transportation standard c. Considering the City's VMT threshold is a function of VMT per capita, a reduction in the number of residents would correspond with a reduction in total VMT and, thus, result in an equivalent rate of VMT per capita. Consequently, the Reduced Footprint Alternative would result in similar impacts related to the emission of GHGs as compared to the proposed project, and impacts would remain significant and unavoidable.

Based on the above, overall impacts related to air quality and GHG emissions would be fewer with implementation of the Reduced Footprint Alternative compared to the proposed project.

Transportation

Because the Reduced Footprint Alternative would add construction vehicle traffic to area roadways, the Alternative could conflict with existing traffic patterns in the area. However, because the Alternative would involve a reduction of the area of disturbance by 19.2 acres as compared to the proposed project, the overall intensity of construction, and associated impacts, would be reduced. Nonetheless, because construction vehicle traffic could conflict with existing traffic patterns, Mitigation Measure 4.2-1 related to preparation of a construction management plan would still be required.

Given that the Reduced Footprint Alternative would include 120 residential units, the maximum number of trips would be fewer than the maximum number of trips that would result from the proposed project. Based on vehicle trip generation rates provided in the Transportation Impact Assessment, the Reduced Footprint Alternative would result in approximately 3,033 ADT during operations, as compared to a maximum of 4,732 ADT occurring with development of the proposed project (see Table 6-5).

Table 6-5
Reduced Footprint Trip Generation

Land Use	Unit/Quantity	Daily Trip Generation
Project Trip Generation		
Single-Family Detached Housing[1]	300 Dwelling Units	2,832
Assisted Living[2]	150 Beds	390
Neighborhood Commerical[3]	40,000 SF	1,510
	Total Project Trips	***4,732***
Alternative Trip Generation		
Single-Family Detached Housing[1]	120 Dwelling Units	1,133
Assisted Living[2]	150 Beds	390
Neighborhood Commerical[3]	40,000 SF	1,510
	Total Project Trips	***3,033***

Notes:
[1] ITE land use category 210 – Single-Family Homes (Adj Streets, 7-9A, 4-6P): Daily: (T) = 9.44 (X)
[2] ITE land use category 254 – Assisted Living (Adj Streets, 7-9A, 4-6P): Daily: (T) = 2.60(X)
[3] ITE land use category 820 – Shopping Center (Adj. Streets, 7-9A, 4-6P) Daily: (T) = 37.75(X)

Source: Fehr & Peers, 2022.

As discussed above, considering the City's VMT threshold is a function of VMT per capita, a reduction in the number of residents would correspond with a reduction in total VMT and, thus, result in an equivalent rate of VMT per capita. However, total project-generated VMT would be reduced by reducing the number of proposed units. Because the City's VMT threshold is a per capita rate, the Alternative's reduced intensity of units would not avoid the project's potential to exceed the City's VMT threshold. The alternative would still require Mitigation Measures 4.2-3(a), 4.2-3(b). However, total project-generated VMT would be reduced and, consequently, the Alternative's impacts related to transportation would be fewer as compared to the proposed project. Nonetheless, although impacts related to transportation would be fewer, the Reduced Footprint Alternative would not eliminate the significant and unavoidable impact related to the City's VMT threshold.

Based on the above, development of the Reduced Footprint Alternative would result in fewer impacts related to transportation compared to the proposed project.

6.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

An EIR is required to identify the environmentally superior alternative from among the range of reasonable alternatives that are evaluated. Section 15126(e)(2) of the CEQA Guidelines requires that an environmentally superior alternative be designated and states, "If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." In this case, the No Project (No Build) Alternative would be considered the environmentally superior alternative, because the project site is assumed to remain in its current condition under the Alternative. Consequently, many of the impacts resulting from the proposed project would not occur under the Alternative, as shown in Table 6-6 below.

As noted above, the No Project (No Build) Alternative would not meet any of the project objectives. The Buildout Pursuant to Existing Land Use Designations Alternative would not be capable of meeting Project Objective #1; however, the remaining project objectives would be fully or partially met under the Alternative. Under both the Reduced Density Alternative and the Reduced Footprint Alternative, all project objectives would be fully or partially met.

As discussed throughout this chapter, the Buildout Pursuant to Existing Land Use Designations and the Reduced Density Alternative would result in similar impacts related to air quality and GHG emissions and fewer impacts related to transportation. Impacts related to air quality and GHG emissions and transportation would be fewer under the Reduced Footprint Alternative.

The development of the Reduced Footprint Alternative would fully or partially satisfy all project objectives and would result in fewer impacts compared to the proposed project. In addition, although the Reduced Footprint Alternative would still require implementation of mitigation, overall VMT as compared to the proposed project would ultimately be fewer. Nonetheless, impacts related to VMT and GHG emissions would be anticipated to remain significant and unavoidable.

Overall, because the Reduced Footprint Alternative would result in fewer impacts related to air quality and GHG emissions and transportation, the Reduced Footprint Alternative would be considered the environmentally superior alternative to the proposed project.

Table 6-6
Comparison of Environmental Impacts for Project Alternatives

Resource Area	Proposed Project	No Project (No Build) Alternative	Buildout Pursuant to Existing Land Use Designations Alternative	Reduced Density Alternative	Reduced Footprint Alternative
Air Quality and Greenhouse Gas Emissions	Significant and Unavoidable	None	Similar*	Similar*	Fewer*
Transportation	Significant and Unavoidable	None	Fewer*	Fewer*	Fewer*
	Total Fewer:	**2**	**1**	**1**	**2**
	Total Similar:	**0**	**1**	**1**	**0**
	Total Greater	**0**	**0**	**0**	**0**

Notes: No Impact = “None;” Less than Proposed Project = “Fewer;” and Similar to Proposed Project = “Similar”

* Significant and Unavoidable impact(s) determined for the proposed project would still be expected to occur under the Alternative.

7. EIR Authors and Persons Consulted

7. EIR Authors and Persons Consulted

Raney Planning & Management, Inc.

C. Timothy Raney, AICP	President
Cindy Gnos, AICP	Senior Vice President
Nick Pappani	Vice President
Rod Stinson	Vice President / Air Quality Specialist
Angela DaRosa	Division Manager / Air Quality Specialist
Jesse Fahrney	Senior Associate / Air Quality Technician

City of Antioch

Kevin Scudero	Senior Planner

Fehr & Peers

Bill Burton, PE, RSP	Principal
Shane Russell, EIT	Transportation Engineer

Other

Other persons and sources consulted in preparation of this EIR are listed in Chapter 8, References, of this EIR. In addition, please see Appendix A for references and persons consulted in preparation of the Initial Study for the proposed project.

8. References

8. REFERENCES

1. Association of Bay Area Governments and Metropolitan Transportation Commission. *Forecasting and Modeling Report, Appendix 1: Growth Pattern*. October 2021.
2. Association of Bay Area Governments and Metropolitan Transportation Commission. *Plan Bay Area 2050: Final*. October 2021.
3. Bay Area Air Quality Management District. *Air Quality Plans*. Available at: http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans.aspx. Accessed March 2022.
4. Bay Area Air Quality Management District. *Air Quality Summary Reports*. Available at: http://www.baaqmd.gov/about-air-quality/air-quality-summaries. Accessed May 2022.
5. Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines*. April 2023.
6. Bay Area Air Quality Management District. *Final 2017 Clean Air Plan: Spare the Air, Cool the Climate*. April 2017.
7. Cal-Adapt. *Local Climate Change Snapshot for Antioch, California*. Available at: https://cal-adapt.org/tools/local-climate-change-snapshot. Accessed May 2022.
8. California Air Pollution Control Officers Association. *California Emissions Estimator Model User Guide Version 2020.4.0*. May 2021.
9. California Air Resources Board. *2022 Scoping Plan for Achieving Carbon Neutrality*. November 16, 2022. Available at: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents. Accessed December 2022.
10. California Air Resources Board. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005.
11. California Air Resources Board. *Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling*. October 24, 2013.
12. California Air Resources Board. *In-Use Off-Road Diesel Vehicle Regulation*. December 10, 2014.
13. California Air Resources Board. *Reducing Toxic Air Pollutants in California's Communities*. February 6, 2002.
14. California Code of Regulations, Title 13, Article 4.8, Chapter 9, Section 2449.
15. City of Antioch. *Aviano Adult Community Project Environmental Impact Report, State Clearinghouse #2006072027*. November 2008.
16. City of Antioch. *City of Antioch General Plan*. Updated November 24, 2003.
17. City of Antioch. *City of Antioch Housing Element 2015-2023*. Adopted April 14, 2015.
18. City of Antioch. *Creekside/Vineyards at Sand Creek Project Environmental Impact Report, SCH# 2020039044*. June 2015.

19. City of Antioch. *General Plan Update Environmental Impact Report*. July 2003.
20. City of Antioch. *The Ranch Project Draft Environmental Impact Report, State Clearinghouse Number 2019060012*. March 20, 2020.
21. City of Antioch. *Vineyards at Sand Creek Environmental Impact Report, SCH#2014092010.* June 2015.
22. Contra Costa County Transportation Authority. *2017 Countywide Comprehensive Transportation Plan*. Adopted September 20, 2017.
23. Contra Costa County Transportation Authority. *East County Action Plan for Routes of Regional Significance*. September 2017.
24. Fehr and Peers. *Transportation Impact Assessment, Albers Ranch*. July 2022.
25. Governor's Office of Planning and Research. *Technical Advisory on Evaluating Transportation Impacts in CEQA.* December 2018.
26. Intergovernmental Panel on Climate Change. *Climate Change 2021: The Physical Science Basis Summary for Policymakers*. Available at: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf. Accessed May 2022.
27. National Highway Traffic Safety Administration. *In Removing Major Roadblock to State Action on Emissions Standards, U.S. Department of Transportation Advances Biden-Harris Administration's Climate and Jobs Goals*. Available at: https://www.nhtsa.gov/press-releases/cafe-preemption-final-rule. Accessed March 2022.
28. U.S. Environmental Protection Agency. *Climate Change Indicators: Atmospheric Concentrations of Greenhouse Gases*. Available at: https://www.epa.gov/climate-indicators/climate-change-indicators-atmospheric-concentrations-greenhouse-gases. Accessed March 2022.
29. U.S. Environmental Protection Agency. *Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026.* Available at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-revise-existing-national-ghg-emissions. Accessed March 2022.
30. U.S. Environmental Protection Agency. *Sources of Greenhouse Gas Emissions*. Available at: https://19january2017snapshot.epa.gov/ghgemissions/sources-greenhouse-gas-emissions_.html. Accessed May 2022.
31. University of California, Davis. *Transportation Project-Level Carbon Monoxide Protocol.* December 1997.
32. WeatherSpark. *Climate and Average Weather Year Round in Antioch California, United States*. Available at: https://weatherspark.com/y/1111/Average-Weather-in-Antioch-California-United-States-Year-Round. Accessed May 2022.

Appendix A

ANTIOCH
CALIFORNIA

NOTICE OF PREPARATION

DATE: October 15, 2021

TO: State Clearinghouse
1400 10th Street, Suite 222
Sacramento, CA 95814
(916) 445-0613

FROM: City of Antioch

SUBJECT: Albers Ranch Project
Notice of Preparation of a Draft Environmental Impact Report

LEAD AGENCY: City of Antioch
Community Development Department
Contact: Forrest Ebbs, Community Development Director
P.O. Box 5007
Antioch, CA 94531-5007
(925) 779-7035
planning@ci.antioch.ca.us

PROJECT APPLICANT: Bryan Wenter, Miller, Starr & Regalia

Notice is hereby given that the City of Antioch will be the Lead Agency and will prepare an environmental impact report (EIR) for the proposed Albers Ranch Project. We are requesting comments on the scope of topics addressed in this EIR.

Please provide comments on the scope of the EIR to Forrest Ebbs, Community Development Director, at the address listed above. Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but not later than **5:00 PM on November 15, 2021**. In your response, please identify a contact person in your agency for future correspondence.

A public scoping meeting will be held by the City to inform interested parties about the proposed project, and to provide agencies and the public with an opportunity to provide comments on the scope and content of the EIR. Because of current COVID-19 health emergency, the scoping meeting will be conducted as a teleconference meeting (no physical location).

EIR Scoping Meeting on the Albers Ranch Project
Thursday | October 28, 2021 | 3:00 PM
Teleconference Meeting (Online only – No physical location)
Zoom: https://us06web.zoom.us/j/81367078075
Phone: (669) 900-6833 | Webinar ID: 813 6707 8075

As an alternative, the City of Antioch will also stream video and audio of the public scoping meeting at the following webpage; however, the link below does not provide the ability to comment during the meeting:

https://www.antiochca.gov/za/zoning-administrator-meetings/

Public comments can be submitted to the Zoning Administrator prior to 3:00 the day of the meeting at the following email address: zoning@ci.antioch.ca.us. All comments received before 3:00 PM the day of the meeting will be provided to the Zoning Administrators at the meeting. Please indicate the agenda item and title in your email subject line. After 3:00 the day of the meeting and during the meeting comments can be submitted directly to the Zoning Administrator through the Zoom webinar.

This EIR Notice of Preparation, the Initial Study, and technical appendices are available online at:

antiochca.gov/environmentaldocs

INTRODUCTION:
The purpose of an EIR is to inform decision-makers and the general public of the environmental effects of a proposed project. The EIR process is intended to provide environmental information sufficient to evaluate a proposed project and its potential to cause significant effects on the environment; examine methods of reducing adverse environmental impacts; and consider alternatives to the proposed project. The Albers Ranch Project EIR will be prepared and processed in accordance with the California Environmental Quality Act (CEQA) and the CEQA Guidelines.

The EIR will generally include the following:

- Description of the project;
- Description of the existing environmental setting for each topic, potential environmental impacts of the project, and mitigation measures;
- Cumulative impacts; and
- Alternatives to the project.

PROJECT LOCATION:
The project site consists of approximately 96.5 acres located east of the Deer Valley Road/Deer Hill Lane intersection in the City of Antioch, Contra Costa County, California. The City of Antioch is within eastern Contra Costa County and is bordered to the north by the San Joaquin River Delta; to the east by the City of Brentwood and the City of Oakley; to the west by the City of Pittsburg and unincorporated portions of Contra Costa County; and to the south by unincorporated portions of Contra Costa County (see Figure 1). The site is identified by Assessor's Parcel Numbers (APNs) 057-042-006 and 057-050-021.

The project site is bordered by the City of Antioch/Contra Costa County line to the south. The City of Antioch/City of Brentwood limit is further east of the site (see Figure 2). Sand Creek is located along the northern border of the site, and State Route (SR) 4 is located approximately 1.44 miles east of the site.

PROJECT SETTING AND SURROUNDING LAND USES:
The project site is situated within the Sand Creek Focus Area of the General Plan, which contains lands designated by the Antioch General Plan for open space, residential, commercial, and mixed-use development. Per the City's General Plan, the majority of the site is designated Hillside, Estate and Executive Residential/Open Space, while the western portion of the site, alongside Deer Valley Road, is designated Commercial/Open Space. The site is zoned Study District.

Figure 1
Regional Project Location

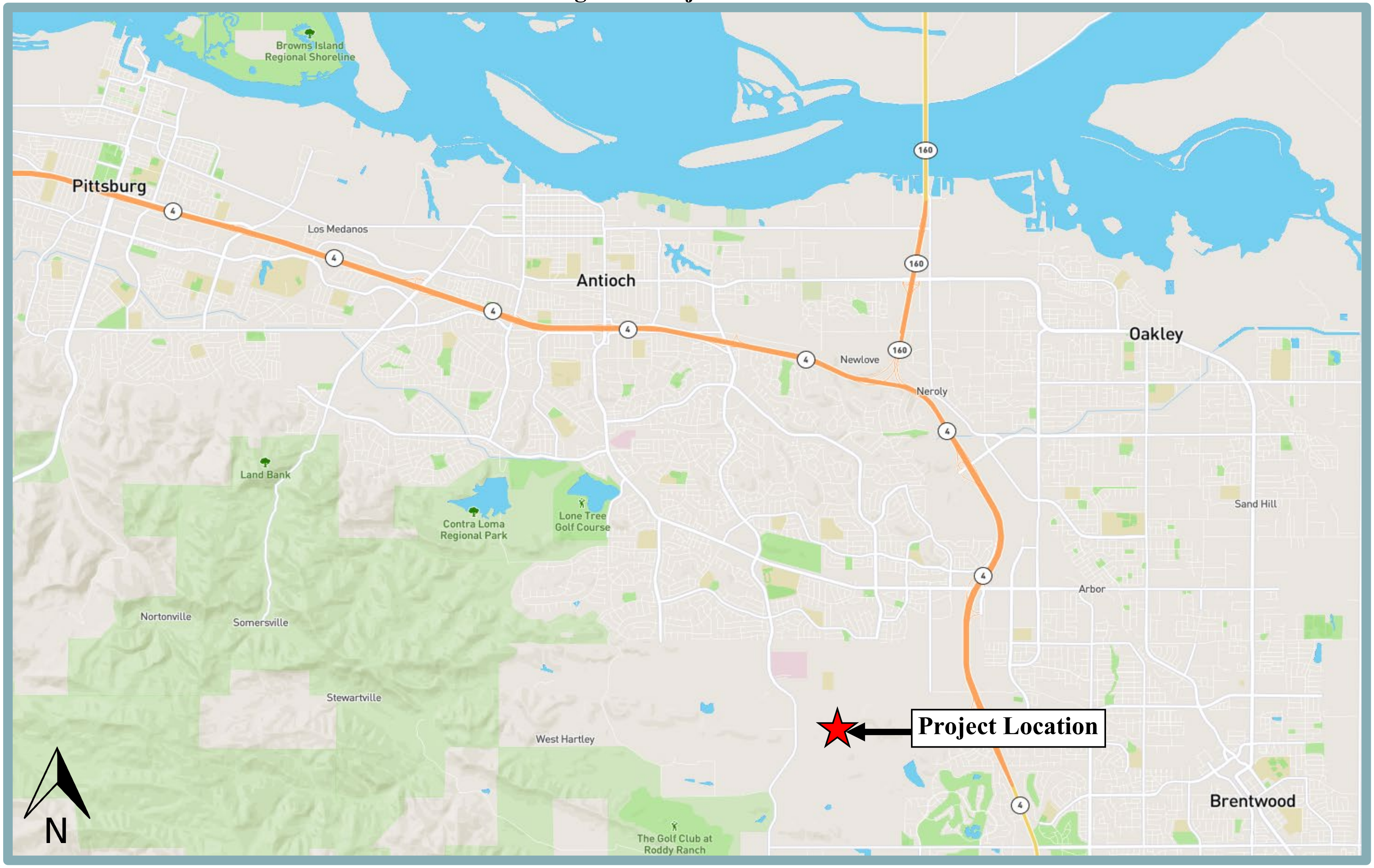
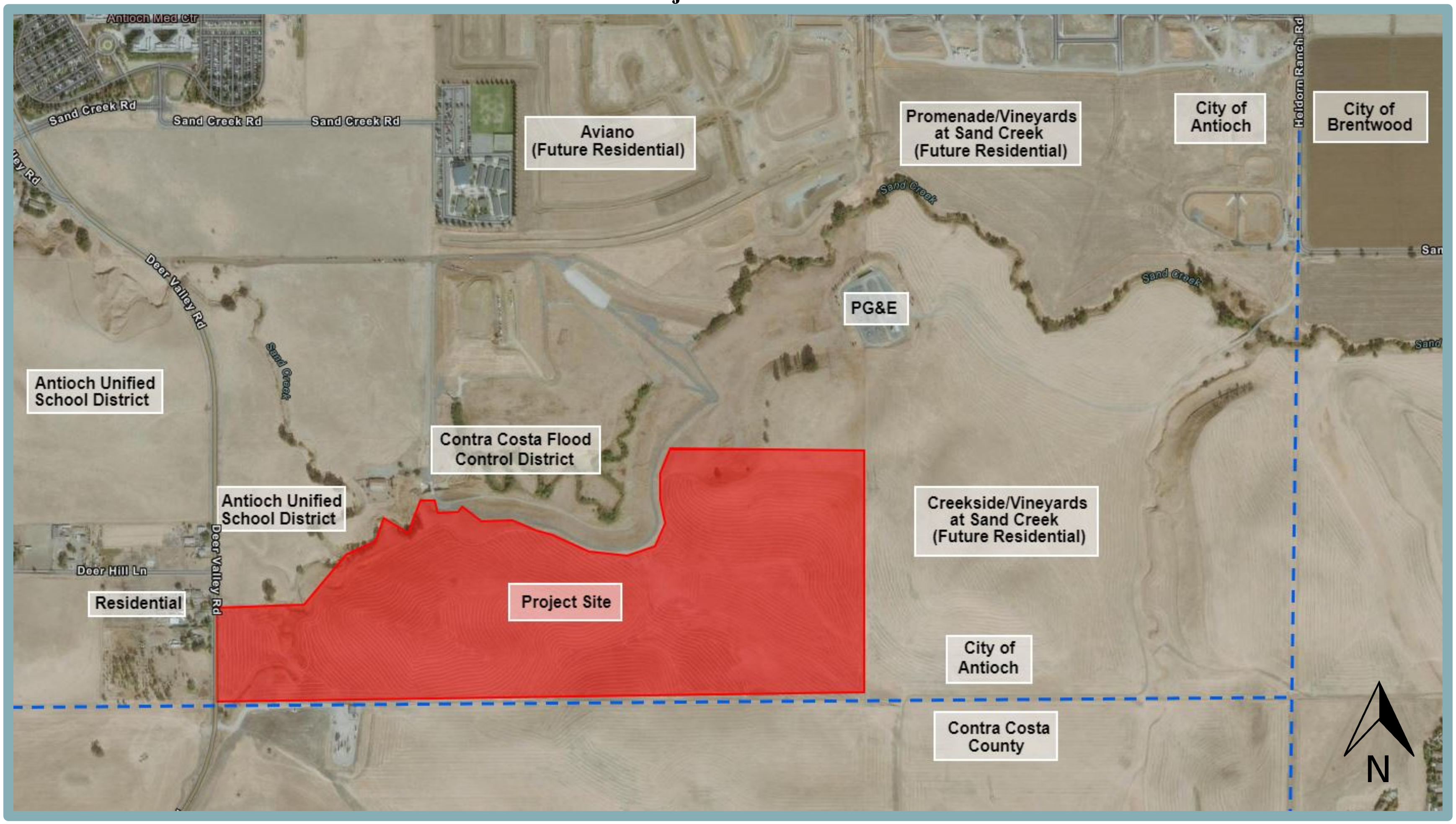


Figure 2
Project Location



The project site is generally rectangular, with the southern, western, and eastern boundaries linear, and the northern property line meandering in and out as it follows Sand Creek towards the respective property corners as show in Figure 2. Currently, the project site is undeveloped, consisting primarily of non-native vegetation. A reach of Sand Creek, a tributary to Marsh Creek, extends through the western portion of the project site.

The topography of the site is defined by two large knolls within the western and northeastern portions of the site. Elevations on the project site range from approximately 324 feet above mean sea level (msl) at the top of the western knoll, to 175 feet at the southeastern corner of the site. It should be noted that currently, 16.5-foot-wide and 10-foot-wide utility easements are located parallel to each other along the site's western boundary. In addition, a second pair of utility easements extends from Deer Valley Road diagonally toward the southern site boundary.

As shown in Figure 2, the majority of the surrounding area has been approved for residential development. Within the City of Antioch, the area to the north of the site is approved for development with the Aviano Project, the area to the northeast of the site is approved for development with the Promenade/Vineyard at Sand Creek Project, and the area to the east is approved for development for the Creekside/Vineyards at Sand Creek Project.

Surrounding existing uses include rural single-family residential located west of the site, across Deer Valley Road, and Contra Costa County Flood Control District (CCCFCD) infrastructure, Upper Sand Creek Basin (Basin), and vacant Antioch School District property to the north. The CCCFCD's Basin is owned in fee title by the CCCFCD and includes additional CCCFCD rights-of-way in the form of easements along the Basin's south and east side. An existing Pacific Gas and Electric Company (PG&E)-owned parcel with an electrical substation, designated Public/Quasi Public per the General Plan, is located northeast of the site. The area south of the site is undeveloped, consisting of dry farmland outside the City's Sphere of Influence and Planning Area, within unincorporated Contra Costa County.

PROJECT DESCRIPTION:

The proposed project would include development of a multi-generational single-family residential subdivision with 294 units, as well as recreational amenities and associated improvements (see Figure 3). The proposed project would also include future development of an assisted living facility and neighborhood commercial development upon issuance of a Conditional Use Permit (CUP). Development of the single-family residential subdivision, assisted living facility, and neighborhood commercial land uses, including proposed roadways, would total approximately 47.4 acres. The remaining 49.1 acres of the site would be retained as open space.

The project would require City approval of the following: General Plan Amendment, Master Development Plan/Rezone, Development Agreement, and Vesting Tentative Subdivision Map. The details of the proposed project, including required approvals, are described in further detail below.

General Plan Amendment

The proposed project would include a General Plan Amendment to the land use map for the Sand Creek Focus Area of the General Plan to change the portion of the site currently designated Hillside, Estate and Executive Residential/Open Space to Medium Low Density Residential/Open Space. The western portion of the site; designated Commercial/Open Space, will retain the existing designations. The proposed project would also include a General Plan Amendment to the text of the Sand Creek Focus Area of the General Plan in order to add a sub area to the Sand Creek Focus Area called the Albers Ranch Sub Area.

Master Development Plan/Rezone/Development Agreement
The proposed project would require approval of a rezone to change the zoning designation of the site from Study District to Hillside Planned Development (HPD), subject to a Master Development Plan. The Master Development Plan and HPD district would list the development standards applicable to the project site, including setbacks, lot sizes, and building heights for the single-family residential subdivision. The future assisted living facility and neighborhood commercial land uses would be required to comply with the Zoning Ordinance. In addition, the applicant is requesting City approval of a Development Agreement, which would assure the City that the proposed project would proceed to its completion in compliance with the plans submitted by the applicant, and assure the applicant of vested rights to develop the project.

Vesting Tentative Subdivision Map
The proposed project would include a Vesting Tentative Subdivision Map (see Figure 3) to subdivide the project site into 294 single-family lots. Of the 96.5-acre site, only 79.9 acres are considered developable due to site constraints (e.g., slopes greater than 25 percent), three acres of which are proposed for future development of an assisted living facility and neighborhood commercial land uses. Approximately 31.2 acres are proposed for development of single-family residential lots, 13.2 acres would be developed with private streets, and 49.1 acres would be used for parks, open space, recreation, and water quality/detention purposes. Table 1 provides a summary of the proposed land uses.

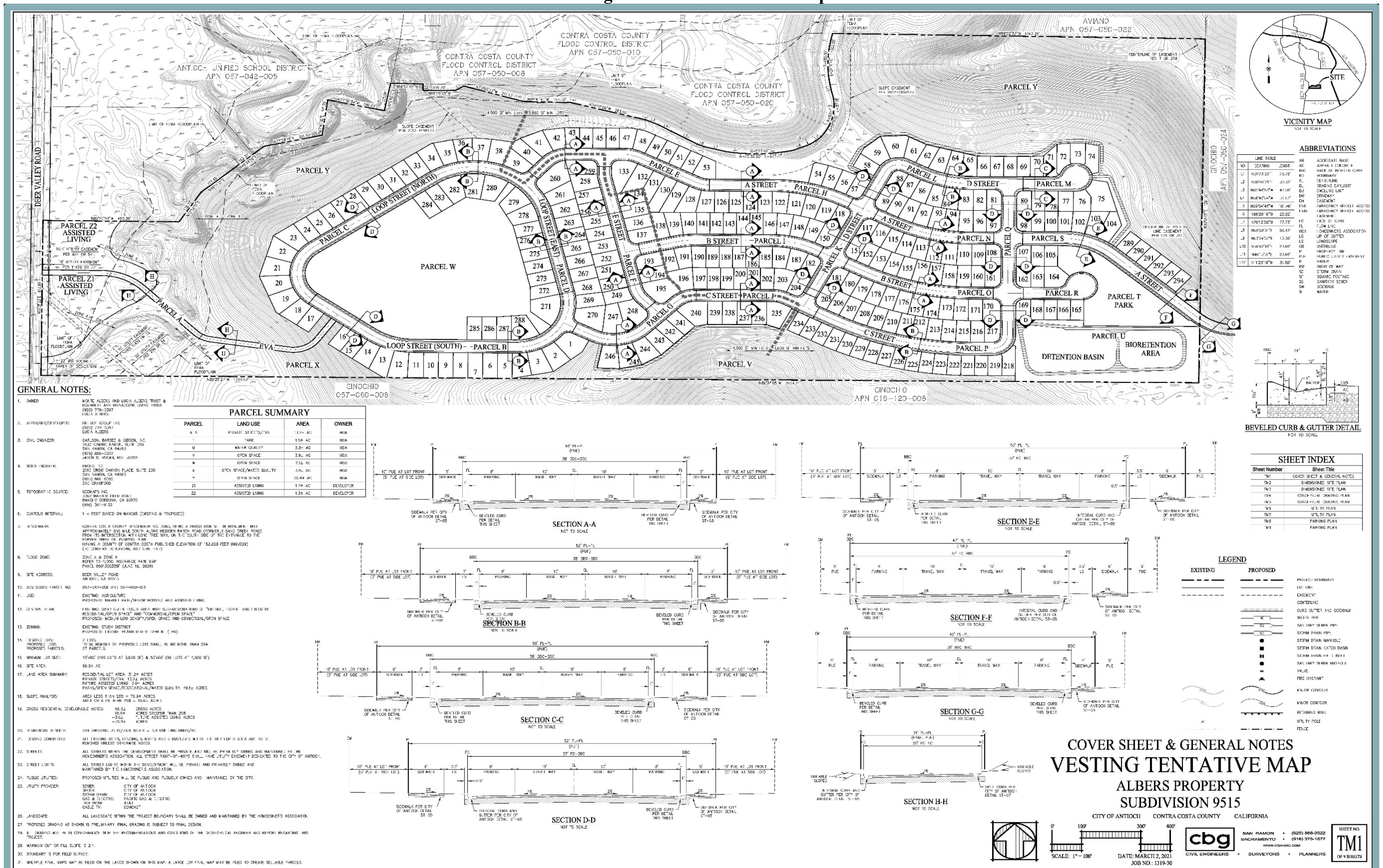
Table 1
Proposed Land Uses

Proposed Land Use	Parcels	Acreage
Single-Family Residential	-	31.2
Private Streets/EVA	A-S	13.2
Parks/Open Space/Recreational/Water Quality	T, V, W, X, Y, U	49.1
Future Assisted Living Facility and Neighborhood Commercial	Z1, Z2	3.0
Total	**--**	**96.5**

The areas to remain open space would include the hillside within the northeastern portion of the site, the hillside along the center of the southern site boundary, the upper reaches of the existing knoll within the western portion of the site, and a setback between the future development parcels along Deer Valley Road and the proposed homes associated with Sand Creek.

<u>Single-Family Residential</u>
The proposed single-family residential uses would represent a continuation of other planned development in the project vicinity. The average density of the proposed residential development would be approximately 3.8 dwelling units per acre (294 units/76.9 acres of developable land). Six different models, each with three different elevations, would be constructed. Residential lot sizes would generally transition from larger sizes within the eastern portion of the site, closer to the Creekside/Vineyards at Sand Creek Project, to slightly smaller sizes within the western portion of the site ranging from a minimum of 3,600 square feet (sf) to a maximum of 9,000 sf.

Figure 3
Vesting Tentative Subdivision Map



Access and Circulation

The area to the east of the site is planned for future development with the Creekside/Vineyards at Sand Creek Project, which would include extension of a new roadway, Hillcrest Avenue, to the eastern site boundary. Primary access to the proposed project would be provided by a new on-site roadway connecting to the planned Hillcrest Avenue extension east of the site. The connection to Hillcrest Avenue is contingent upon construction of the Creekside/Vineyards at Sand Creek Project. In the event that the Creekside/Vineyards at Sand Creek Project is not constructed, access to the proposed project may be provided by an alternate roadway connecting the northern portion of the project site to the future Sand Creek Road included as an Irrevocable Offer of Dedication (IOD) as part of the Aviano Project. If the developer desires the optional roadway for development, the developer would need to acquire a portion of the right-of-way from the CCCFCD in order to construct the optional road. The sale of right-of-way is at the CCCFCD discretion. An emergency vehicle access (EVA) only roadway would provide secondary access from Deer Valley Road to the western portion of the project site. Within the project site, all proposed internal streets would be private and would be consistent with applicable City of Antioch design standards. Parking would be allowed on both sides of the internal roadways, providing for a total of 362 spaces. In addition, two covered garage parking spaces would be provided within each residential unit, providing a total of 588 spaces.

Parks, Trails, Open Space, and Landscaping

As part of the proposed project, a total of 41.9 acres would be reserved for parks and recreational facilities and retained as open space (see Figure 4).

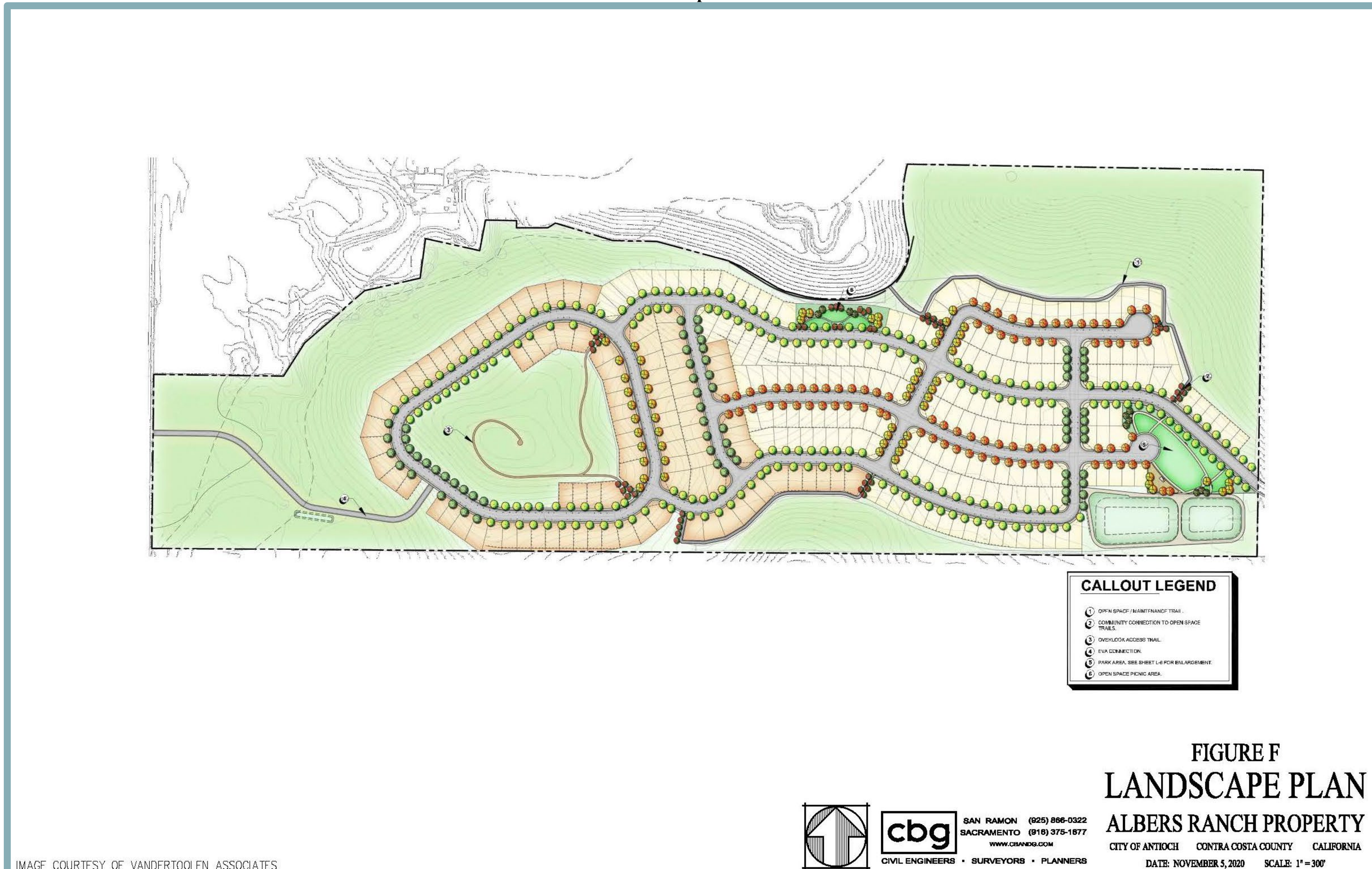
Parcel T, located in the southeastern portion of the project site, would include a 1.5-acre park to provide recreational services to the project site. Parcel X, located south of the EVA, would be retained as open space, with a portion of the parcel to be used for water quality/bioretention purposes. Parcels V, W, and Y would be preserved as open space and would include trails accessible to future residents. Parcel V would be located on the southern border of the project site and would include an open space/maintenance trail. Parcel W is located on the western knoll of the project site surrounded by proposed residential lots and would include an overlook access trail. Parcel Y would be located along the northern portion of the project site and would also include an open space/maintenance trail.

The proposed project would include community trails between lots throughout the project site to provide access to the designated open space/trails in Parcels V, W, and Y. Two community trails, located north of Parcel V, would provide residential access to the designated open space/maintenance trail in Parcel V. Additionally, two community trails, east of Parcel W, would provide residential access to the overlook access trail in Parcel W.

In addition, three community trails, located in the northeast portion of the project site, would provide residential access to the designated open space/maintenance trail in Parcel Y. The designated open space/maintenance trail in Parcel Y would provide community access to Sand Creek. The proposed project would also include an open space picnic area between lots 53 and 54 south of Sand Creek.

Landscaping features would be provided throughout the proposed development area and would conform to the requirements and provisions of Section 9-5.1001 of the City of Antioch Municipal Code. Individual residences would also be landscaped with trees, shrubs, groundcover and some lawns, and would be maintained by the individual owners. Public spaces, open spaces, and private landscaping areas would have an emphasis on drought-tolerant and adaptive plant species.

Figure 4
Landscape Plans



Utilities
Figure 5 illustrates the proposed water, sewer, and stormwater utility improvements associated with the project.

Water supply for the proposed development would be provided by the City. Potable water would be distributed to the project site by an existing 12-inch Zone III trunk line in the future Hillcrest Avenue. The water line would continue south to I Street planned by the Creekside/Vineyards at Sand Creek Project, then head west to the proposed project boundary. The internal private streets within the proposed project would include water lines that would connect to the water line from the Creekside/Vineyards at Sand Creek Project. In addition, a water line would be undergrounded below the proposed EVA road in the western portion of the site, and follow Deer Valley Road north to connect to the City's existing water system (see Figure 5).

Wastewater conveyance for the proposed development would be provided by the City. The proposed project would include construction of sanitary sewer lines beneath the proposed private streets that would connect to I Street in the Creekside/Vineyards at Sand Creek Project. The Creekside/Vineyards at Sand Creek Project includes a main sewer line that would eventually connect to a planned sewer line in Sand Creek Road.

The project site naturally drains to the east. The proposed project would include construction of a series of drain inlets and underground storm drain pipes to capture stormwater runoff from impervious surfaces created by the project. Runoff would be routed to a detention basin and bio-retention basin located within the southeastern portion of the project site (Parcel U). The basin would provide for treatment and detention of captured stormwater runoff.

The stormwater flows would be metered from the basin to match pre-development rates. A discharge line would be constructed into I Street of the Creekside/Vineyards at Sand Creek Project. The proposed EVA road in the western portion of the site would generate a relatively small amount of runoff. The runoff from the EVA road would be collected into a proposed bio-swale within Parcel X and eventually discharge through a new outfall into Sand Creek. Detention of the runoff from the EVA would not be necessary as Sand Creek drains into the Basin.

Electricity for the proposed project would be provided by PG&E. Telecommunication services would be provided by AT&T. Comcast and Astound would provide cable television and internet services to the project site. Dry utilities, electrical, gas, and technology lines would be extended from Sand Creek Road beneath future Hillcrest Avenue to the project site.

The proposed project would not conflict with the existing utility easements located along the site's western boundary or southwestern portion of the site.

Off-Site Improvements
As noted above, should the Creekside/Vineyards at Sand Creek Project not be developed, an alternative roadway to the north may be constructed as part of the proposed project. Figure 6 below illustrates the proposed alternative roadway connection configuration. As shown in the figure, the alternative roadway would connect the northern portion of the site to the future Sand Creek Road, following the eastern boundary of the CCCFCD property and Basin and crossing Sand Creek. Any roadway and associated grading of the alternate roadway near the Basin's main dam and/or saddle dike would require Division of Safety of Dams (DSOD) discretionary approval. In addition, the project applicant would be required to obtain a CCCFCD encroachment permit for any work planned within the CCCFCD right-of-way. The optional roadway was included as part of the Aviano Project and has been analyzed within the associated EIR.

Figure 5
Utility Plan

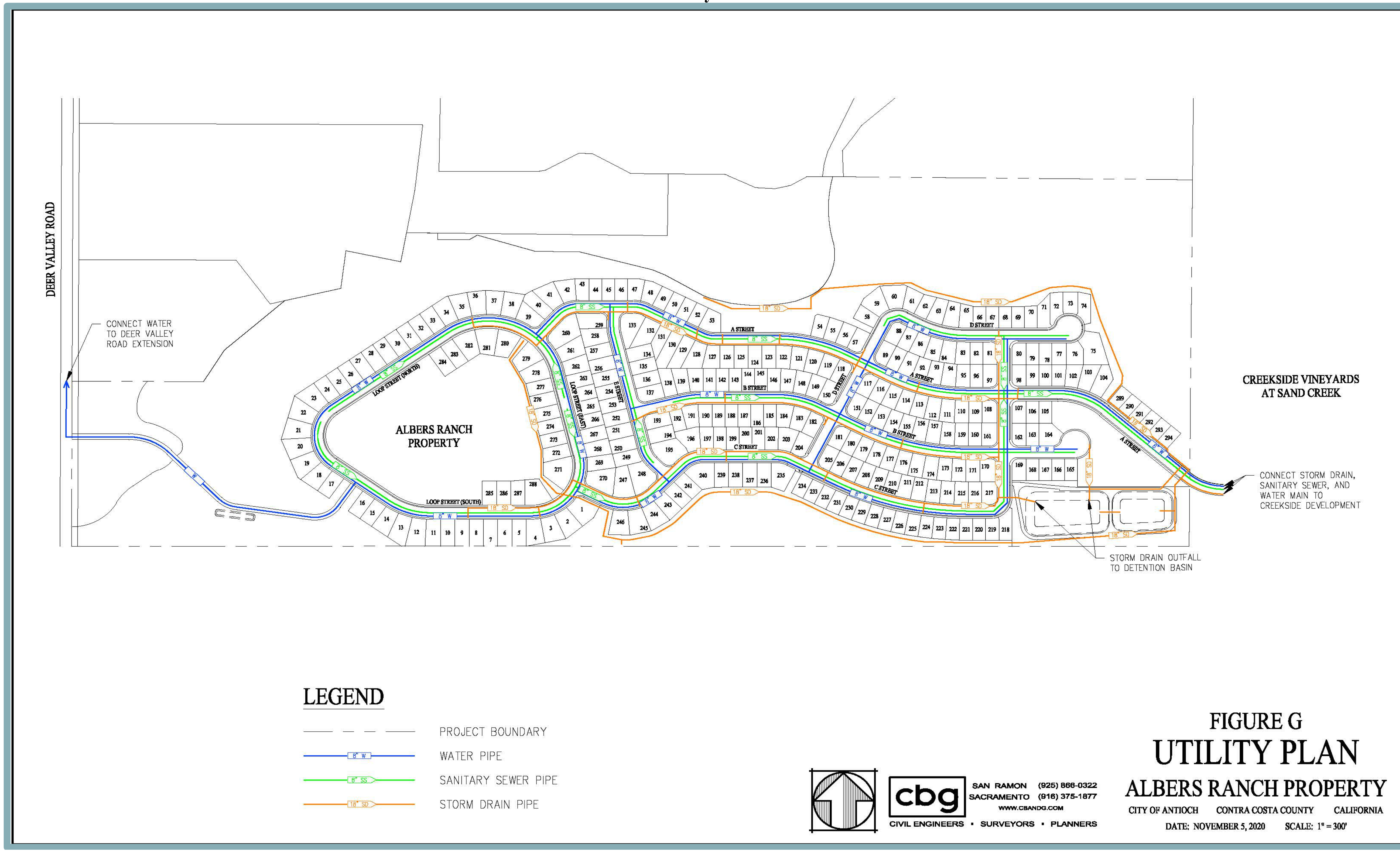
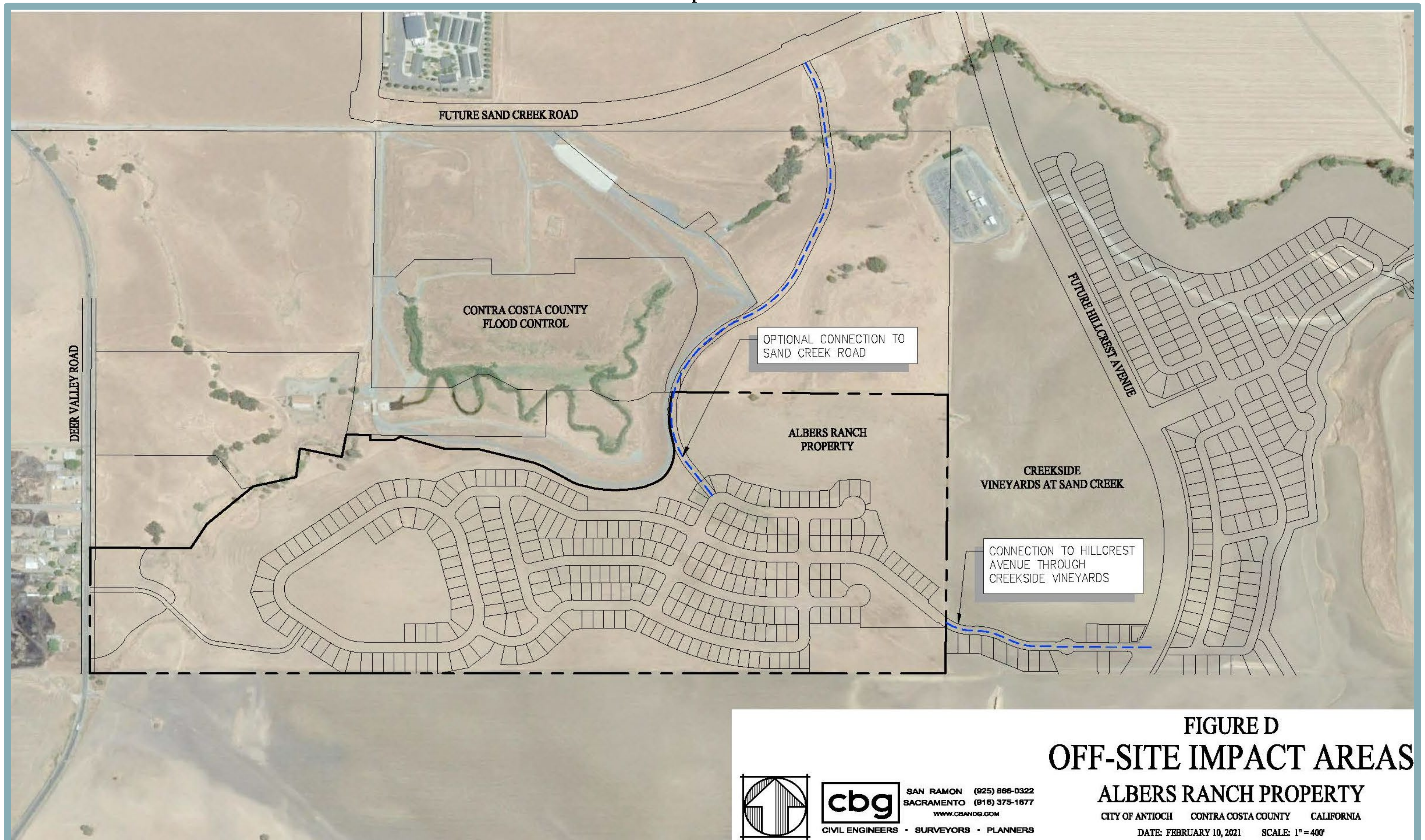


Figure 6
Off-site Improvement Area



Project Construction
All project improvements, including off-site improvements, are anticipated to be built over two phases. While detailed phasing information is not available at this time, each phase would involve development of single-family homes arranged into several neighborhoods.

Project grading would be balanced on-site with import/export minimized to the extent feasible. Final grading is dependent on utility configurations and geotechnical considerations. While portions of the open space areas would not be subject to ground disturbances as part of the project, limited grading would be required at the western knoll within the site, along the southeastern site boundary, and along the perimeter of the lots within the northeastern portion of the site. Overall, a total of 66 acres within the project site would be subject to grading as part of the proposed project. The limits of the proposed grading activity are shown in Figure 7 and Figure 8. As shown in the figures, five-foot-tall (maximum) and 15-foot-tall (maximum) retaining walls would be required along the perimeter of the proposed lots in certain locations to accommodate the sloping topography of the site.

Future Assisted Living and Neighborhood Commercial Development
The three acres retained for future assisted living and neighborhood commercial development would consist of two parcels totaling 1.7 and 1.3 acres, respectively, located along Deer Valley Road within the western portion of the project site. Upon issuance of a CUP, the future development is anticipated to include an approximately 150-bed assisted living facility and approximately 40,000 square feet (sf) of neighborhood commercial land uses. While not anticipated for development as part of the proposed project, this EIR includes analysis of the future buildout of the parcels.

PROJECT ENTITLEMENTS AND APPROVALS:
Requested project entitlements are anticipated to include the following:

- General Plan Amendment. The proposed project would require approval of a General Plan text and map amendment to the Sand Creek Focus Area of the General Plan to change the land use designations of the site from Hillside, Estate and Executive Residential/Open Space and Commercial/Open Space to Medium Low Density Residential/Open Space and Commercial/Open Space. A text amendment to the Sand Creek Focus Area of the General Plan would also be required to add the Albers Ranch Sub Area to the Sand Creek Focus Area.
- Master Development Plan/Rezone/Development Agreement. The proposed project would require a rezone from Study District to HPD. HPD would include development standards for the project. The Development Agreement would allow the City and the applicant to enter into an agreement to assure the City that the proposed project would be completed in compliance with the plans submitted by the applicant, and assure the applicant of vested rights to develop the project.
- Vesting Tentative Map Subdivision. The proposed project would require approval of a VTM for the subdivision of the project site into multiple parcels to accommodate 294 single-family residential units, a parcel for a potential future assisted living facility and neighborhood commercial land uses, and recreation, parks, and open space.
- Resource Management Plan. Pursuant to Section 4.4.6.7(t) of the City of Antioch General Plan, the applicant will prepare a Resource Management Plan for City Approval.

Figure 7
Conceptual Grading Plan (West)

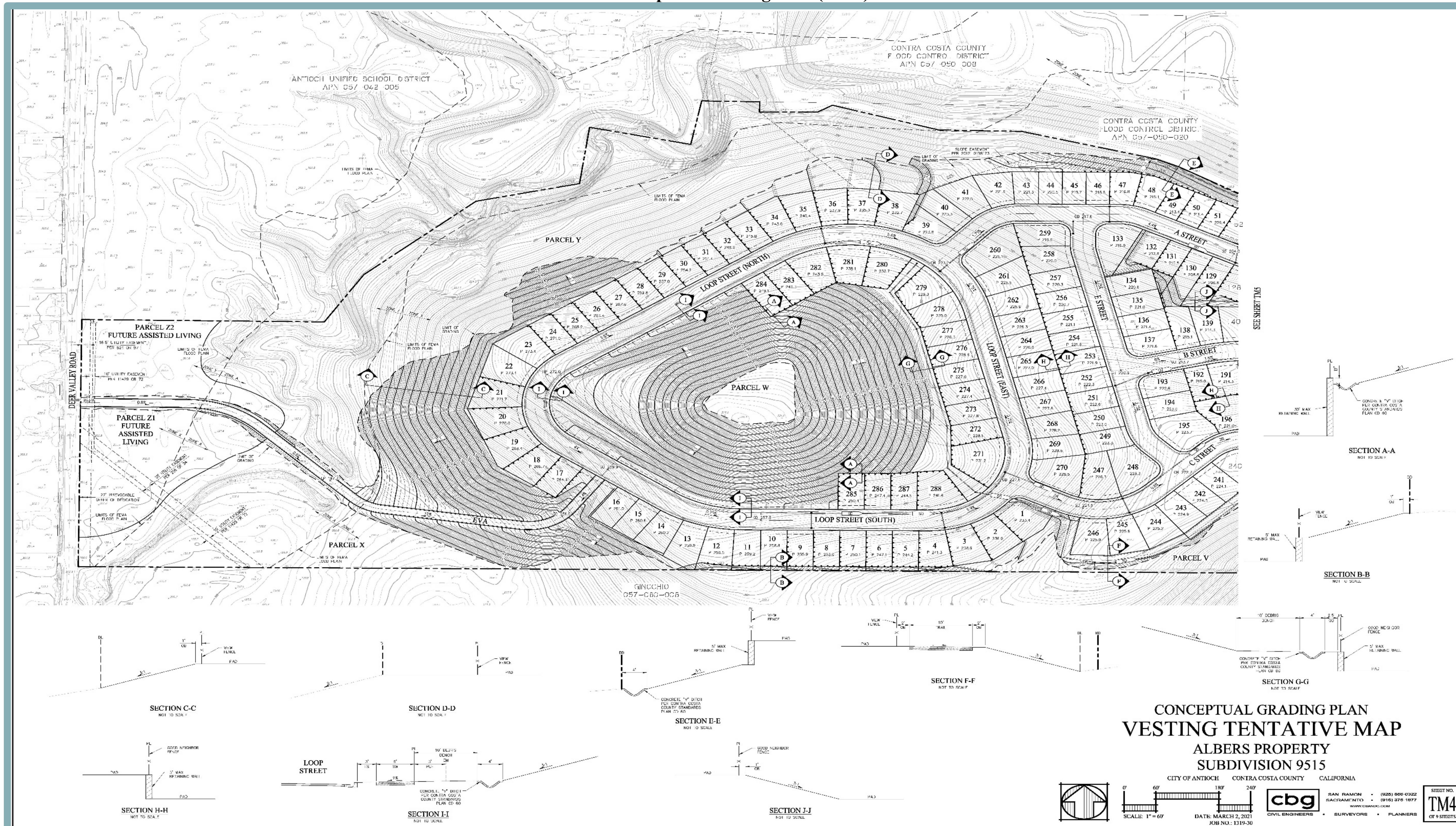


Figure 8
Conceptual Grading Plan (East)

In addition to approvals from the City of Antioch, the proposed project may require approvals/permits from the following State, federal, or local agencies:

- Bay Area Air Quality Management District (BAAQMD);
- California Department of Fish and Wildlife (CDFW);
- California DSOD;
- Central Valley Regional Water Quality Control Board (CVRWQCB);
- CCCFCD;
- U.S. Army Corps of Engineers (USACE); and
- U.S. Fish and Wildlife Service (USFWS).

PROBABLE ENVIRONMENTAL EFFECTS:
The City has reviewed the proposed project and has prepared an Initial Study (see attached). Based on the analysis within the Initial Study, the City has determined that an EIR should be prepared for the proposed project to address potential project-related impacts to the following environmental resource areas: Air Quality, Greenhouse Gas Emissions, and Transportation. All other CEQA issue areas were determined to be less than significant with implementation of the mitigation measures included in the Initial Study.

Each resource area chapter will include a discussion of the existing setting, thresholds of significance, evaluation of potential impacts, and if necessary, feasible mitigation measures to reduce or eliminate potentially significant impacts. In addition, statutorily required sections and discussion of project alternatives will be included. Some refinement to the aforementioned issues may be required based on comments received during the NOP scoping process. The following section describes each of the technical Chapters of the EIR in further detail.

Air Quality and Greenhouse Gas Emissions
The Air Quality and Greenhouse Gas Emissions chapter of the EIR will summarize the regional air quality setting, including climate and topography, existing ambient air quality, regulatory setting, and presence of any sensitive receptors near the project site. The chapter will address toxic air contaminant (TAC) emissions using the California Air Resource Board (CARB) "Air Quality and Land Use Handbook: A Community Health Perspective." The project's cumulative contribution to regional air quality will be discussed, based in part on the modeling conducted at the project level. Air quality emissions will be modeled using project-specific information applied to the California Emissions Estimator Model (CalEEMod) software. The significance of air quality impacts will be determined in comparison to BAAQMD-recommended thresholds of significance. Mitigation measures will be incorporated to reduce any significant air quality impacts, and anticipated reductions in emissions associated with proposed mitigation measures will be quantified.

The Greenhouse Gas Emissions section will also use CalEEMod to produce an estimate of greenhouse gas (GHG) emissions, including indirect emissions of GHGs (e.g., electricity, natural gas). Emissions will be expressed in units of carbon dioxide equivalents. The analysis will include a discussion of Assembly Bill (AB) 32 and Senate Bill (SB) 32, in compliance with the California Climate Change Scoping Plan. Emission estimates will also be compared to the City of Antioch's Community and Municipal Climate Action Plans and BAAQMD thresholds. With respect to AB 32 and SB 32, the chapter will include a comparison of the estimated emissions to appropriate statewide thresholds. The analysis will discuss the project's applicable mitigation measures, if needed, for reducing GHG impacts.

Transportation
The Transportation chapter of the EIR will incorporate a Traffic Impact Assessment (TIA) provided to evaluate impacts of the proposed project on existing and future transportation systems. Impact

determination for CEQA purposes will be based on vehicle miles traveled (VMT), consistent with CEQA Guidelines Section 15064.3. The VMT analysis will be quantitative in nature and will be prepared consistent with the City's current guidance regarding analysis of VMT.

While not required for CEQA impact determination purposes, this chapter of the EIR will include a level of service (LOS) analysis to be used solely to determine the project's consistency with the City's General Plan LOS standards. The following intersections will be analyzed in the EIR:

1. Lone Tree Way at Hillcrest Avenue;
2. Lone Tree Way at Heidorn Ranch Road/Fairside Way;
3. Sand Creek Road at Deer Valley Road;
4. Sand Creek Road at Hillcrest Avenue (Future Intersection);
5. Sand Creek Road at Heidorn Ranch Road (Future Intersection);
6. Sand Creek Road at State Route 4 Eastbound Ramps;
7. Sand Creek Road at State Route 4 Westbound Ramps;
8. Hillcrest Avenue at Project Access (Future Intersection);
9. Hillcrest Avenue at Prewett Ranch Road;
10. Deer Valley Road at Prewett Ranch Road; and
11. Deer Valley Road at Lone Tree Way.

The following freeway segments will also be analyzed in the EIR:

12. State Route 4, between Laurel Road and Lone Tree Way;
13. State Route 4, between Lone Tree Way and Sand Creek Road;
14. State Route 4, between Sand Creek Road and Balfour Road; and
15. State Route 4, between Balfour Road and Marsh Creek Road.

The traffic operations will be analyzed under the following scenarios:

- Existing;
- Existing Plus Project;
- Near-Term;
- Near-Term Plus Project;
- Cumulative; and
- Cumulative Plus Project.

The existing setting in regards to pedestrian, bicycle and transit facilities will also be discussed. The EIR chapter will include an analysis of the proposed project's potential impacts related to conflicting with applicable programs, policies, and ordinances addressing the circulation system, vehicle safety hazards, and emergency access. Recommended mitigation measures will be incorporated, if necessary, to reduce significant transportation impacts.

Statutorily Required Sections

Pursuant to CEQA Guidelines Section 21100(B)(5), the Statutorily Required Sections chapter of the EIR will address the potential for growth-inducing impacts of the proposed project, focusing on whether removal of any impediments to growth would occur with the project. A summary of the significant and unavoidable impacts identified within the EIR will be included in this chapter, as well as a discussion of significant irreversible impacts. The chapter will also summarize the cumulative impact analyses, which will be provided in each technical chapter of the EIR.

Alternatives Analysis
In accordance with Section 15126.6(a) of the CEQA Guidelines, the EIR will include an analysis of a range of alternatives, including a No Project Alternative. Consideration will be given to potential off-site locations consistent with CEQA Guidelines, Section 15126.6(f)(2), and such locations will be determined in consultation with City staff. If it is determined that an off-site alternative is not feasible, the EIR will include a discussion describing why such a conclusion was reached. The project alternatives will be selected when more information related to project impacts is available in order for the alternatives to be designed to reduce significant project impacts. The chapter will also include a section of alternatives considered but dismissed, if necessary. The Alternatives Analysis chapter will describe the alternatives and identify the environmentally superior alternative. The alternatives will be analyzed at a level of detail less than that of the proposed project; however, the analyses will include sufficient detail to allow a meaningful comparison of the impacts. Such detail may include conceptual site plans for each alternative, basic quantitative air pollutant and GHG emissions, traffic information (e.g., trip generation), as well as a table that will compare the features and the impacts of each alternative.

October 15, 2021

Forrest Ebbs — Date
Community Development Director, City of Antioch

Attachment

Albers Ranch Initial Study

CITY OF ANTIOCH
COMMUNITY DEVELOPMENT DEPARTMENT

ANTIOCH
CALIFORNIA

Albers Ranch

INITIAL STUDY

October 2021

RANEY PLANNING & MANAGEMENT, INC. 20 years

1501 Sports Drive, Suite A, • Sacramento • CA • 95834
Office 916.372.6100 • Fax 916.419.610

TABLE OF CONTENTS

APPENDICES:

INITIAL STUDY

October 2021

A. BACKGROUND

1.	Project Title:	Albers Ranch Project
2.	Lead Agency Name and Address:	City of Antioch Community Development Department P.O. Box 5007 Antioch, CA 94531
3.	Contact Person and Phone Number:	Forrest Ebbs Community Development Director (925) 779-7035
4.	Project Location:	East of Deer Valley Road/Deer Hill Lane intersection Antioch, CA 94513
5.	Project Sponsor's Name and Address:	Bryan Wenter Miller, Star & Regalia 1331 N. California Boulevard Fifth Floor Walnut Creek, CA 94528 (925) 925-9400
6.	Existing General Plan Designation:	Sand Creek Focus Area: "Hillside, Estate and Executive Residential/Open Space" and "Commercial/Open Space"
7.	Proposed General Plan Designation:	Medium Low Density Residential/Open Space and Commercial/Open Space
8.	Existing Zoning Designation:	Study District
9.	Proposed Zoning Designation:	Hillside Planned Development (HPD)
10.	Required Approvals from Other Public Agencies:	Bay Area Air Quality Management District California Department of Fish and Wildlife California Division of Safety of Dams Central Valley Regional Water Quality Control Board Contra Costa County Flood Control District U.S. Army Corps of Engineers U.S. Fish and Wildlife Service

11. Surrounding Land Uses and Setting:

The 96.5-acre site, located east of the Deer Valley Road/Deer Hill Lane intersection in the City of Antioch, is currently undeveloped, consisting primarily of dry-farmed wheat, regularly disked, with native grassland areas. Sand Creek, a tributary to Marsh Creek, is located along the northern border of the site and a reach of Sand Creek extends through the western portion of the project site. The City of Antioch/Contra Costa County line borders the site to the south. The project site is situated within the Sand Creek Focus Area of the General Plan. Per the City's General Plan, the majority of the site is designated Hillside, Estate and Executive Residential/Open Space, while the western portion of the site, alongside Deer Valley Road, is designated Commercial/Open Space. The site is zoned Study District.

The majority of the surrounding area has been approved for residential development. Within the City of Antioch, the area to the north of the site is approved for development with the Aviano Project, the area to the northeast of the site is approved for development with the Promenade/Vineyard at Sand Creek Project, and the area to the east is approved for development for the Creekside/Vineyards at Sand Creek Project. Surrounding existing uses include rural single-family residential development located west of the site, across Deer Valley Road, and vacant Contra Costa County Flood Control District (CCCFCD) property, Upper Sand Creek Basin, and Antioch School District to the north. The area south of the site is undeveloped, consisting of dry farmland outside the City's Sphere of Influence and Planning Area, within unincorporated Contra Costa County.

12. Project Description Summary:

The Albers Ranch Project (proposed project) would include a multi-generational single-family residential subdivision with 294 units, as well as recreational amenities and associated improvements. The proposed project would also include future development of an assisted living facility and neighborhood commercial development upon issuance of a Conditional Use Permit (CUP). Development of the single-family residential subdivision, assisted living facility, and neighborhood commercial land uses, including proposed roadways, would total approximately 47.4 acres. The remaining 49.1 acres of the site would be retained as open space. The project would require City approval of the following: General Plan Amendment, Master Development Plan/Rezone, Development Agreement, and Vesting Tentative Subdivision Map (VTM).

13. Status of Native American Consultation Pursuant to Public Resources Code Section 21080.3.1:

In compliance with Assembly Bill (AB) 52 (Public Resources Code [PRC] Section 21080.3.1), a project notification letter was distributed to the Amah Mutsun Tribal Band of Mission San Juan Bautista, Chicken Ranch Rancheria of Me-Wuk Indians, Indian Canyon Mutsun Band of Costanoan, Muwekman Ohlone Indian Tribe of the SF Bay Area, Nashville Enterprise Miwok-Maide-Nishinam Tribe, North Valley Yokuts Tribe, the Ohlone Indian Tribe, Tule River Indian Trive, Wilton Rancheria, and the Confederated Villages of Lisjan. The letters were distributed on May 19, 2021 and requests to consult were not received within the required response period.

B. SOURCES

The following documents are referenced information sources used for the purposes of this Initial Study:

1. California Air Resources Board. *The 2017 Climate Change Scoping Plan Update.* January 20, 2017.
2. California Department of Conservation. *California Important Farmland Finder.* Available at: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed June 2021.
3. California Department of Forestry and Fire Protection. *Contra Costa County, Very High Fire Hazard Severity Zones in LRA*. January 7, 2009.
4. California Department of Transportation. *California Scenic Highway Mapping System*. Available at: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways. Accessed July 2021.
5. California Energy Commission. *2019 Building Energy Efficiency Standards.* March 2018.
6. CalRecycle. *SWIS Facility/Site Activity Details Keller Canyon Landfill (O7-AA-0032)*. Available at: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/4407?siteID=228. Accessed June 2021.
7. City of Antioch. *2015 Urban Water Management Plan*. May 2016.
8. City of Antioch. *About APD*. Available at: http://www.antiochca.gov/police/about-apd/. Accessed June 2021.
9. City of Antioch*. City of Antioch General Plan*. November 23, 2003.
10. City of Antioch*. City of Antioch Housing Element 2015-2023*. Adopted April 14, 2015.
11. City of Antioch. *Citywide Design Guidelines Manual*. October 2009.
12. City of Antioch. *Draft General Plan Update Environmental Impact Report*. July 2003.
13. Contra Costa Clean Water Program. *Stormwater C.3. Guidebook, Stormwater Quality Requirements for Development Applications*. May 17, 2017.
14. Contra Costa County Department of Conservation and Development. *2016 Agricultural Preserves Map.* February 1, 2017.
15. Department of Toxic Substances Control. *EnviroStor.* Available at: https://dtsc.ca.gov/your-envirostor/. Accessed June 2021.
16. ENGEO Incorporated. *Phase One Environmental Site Assessment Sullenger Ranch Antioch, California.* June 29, 2005.
17. ENGEO Incorporated. *Preliminary Geotechnical Exploration Sullenger Ranch, Antioch, Ca.* June 29, 2005.
18. Live Oak Associates, Inc. *Albers Project Site, Technical Biological Report, Antioch, California.* August 9, 2021.
19. Natural Investigations Company. *Cultural and Paleontological Resources Inventory for the Albers Ranch Project, City of Antioch, Contra Costa County California.* May 25, 2021.
20. San Francisco Bay Regional Water Quality Control Board. *Order No. R2-2019-0035, NPDES No. CA0038547*. Adopted December 11, 2019.
21. Saxelby Acoustics LLC. *Environmental Noise Assessment Albers Ranch Project*. June 22, 2021.

C. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐	**Aesthetics**	☐	**Agriculture and Forest Resources**	✖	**Air Quality**
✖	**Biological Resources**	✖	**Cultural Resources**	☐	**Energy**
✖	**Geology and Soils**	✖	**Greenhouse Gas Emissions**	✖	**Hazards and Hazardous Materials**
✖	**Hydrology and Water Quality**	☐	**Land Use and Planning**	☐	**Mineral Resources**
✖	**Noise**	☐	**Population and Housing**	☐	**Public Services**
☐	**Recreation**	✖	**Transportation**	✖	**Tribal Cultural Resources**
☐	**Utilities and Service Systems**	☐	**Wildfire**	✖	**Mandatory Findings of Significance**

D. DETERMINATION

On the basis of this initial study:

☐ I find that the Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the applicant. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

× I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

______________________________	______________________________
Signature	Date
Forrest Ebbs, Community Development Director	City of Antioch
Printed Name	For

E. BACKGROUND AND INTRODUCTION

This Initial Study identifies and analyzes the potential environmental impacts of the Albers Ranch Project (proposed project). The information and analysis presented in this document is organized in accordance with the order of the California Environmental Quality Act (CEQA) checklist in Appendix G of the CEQA Guidelines. Where the analysis provided in this document identifies potentially significant environmental effects of the project, mitigation measures are prescribed.

The mitigation measures prescribed for environmental effects described in this Initial Study would be implemented in conjunction with the project, as required by CEQA. The mitigation measures would be incorporated into the project through project conditions of approval. The City would adopt findings and a Mitigation Monitoring/Reporting Program for the project in conjunction with approval of the project.

In 2003, the City of Antioch completed a comprehensive update of the City's General Plan and adopted an Environmental Impact Report (EIR) for the updated General Plan. The General Plan EIR is a program EIR, prepared pursuant to Section 15168 of the CEQA Guidelines (Title 14, California Code of Regulations [CCR] Sections 15000 *et seq*.). The General Plan EIR analyzed full implementation of the General Plan and identified measures to mitigate the significant adverse impacts associated with the General Plan. Consistent with Section 15150 of the CEQA Guidelines, applicable portions of the General Plan and General Plan EIR are incorporated by reference as part of this Initial Study.

The City certified an EIR for the Aviano Project, located to the north of the project site, in 2008 and for the Creekside/Vineyards at Sand Creek Project, located immediately east of the project site, in 2020. The Aviano Project will include an adult residential development that comprises up to 535 adult single-family units and associated improvements, including a recreational facility, parks and landscaped areas, on approximately 93 acres. The Aviano Project also includes a 60-foot wide 1.5-acre easement crossing Sand Creek to allow for a future access road to development south of the Aviano project site. The Creekside/Vineyards at Sand Creek Project will include the construction of 220 single-family residential units and associated improvements on approximately 59.9 acres of the 158.2-acre project site, as well as 1.8 acres of off-site improvements. As part of the Creekside/Vineyards at Sand Creek Project, Hillcrest Avenue would be extended through the Creekside/Vineyards at Sand Creek project site. The proposed project is independent of the Creekside/Vineyards at Sand Creek Project, but would connect to planned infrastructure improvements to be constructed as part of that project. Similarly, the proposed project includes a potential access roadway option that would involve connection to a planned access road of the Aviano Project, should the Creekside/Vineyards at Sand Creek project access not be completed. Thus, the analysis within this Initial Study incorporates the certified EIRs for the aforementioned previously approved projects by reference as necessary.

F. PROJECT DESCRIPTION

The following provides a description of the project site's current location and setting, as well as the proposed project components and the discretionary actions required for the project.

Project Location and Setting

The project site consists of approximately 96.5 acres located east of the Deer Valley Road/Deer Hill Lane intersection in the City of Antioch, Contra Costa County, California.

The City of Antioch is within eastern Contra Costa County and is bordered to the north by the San Joaquin River Delta; to the east by the City of Brentwood and the City of Oakley; to the west by the City of Pittsburg and unincorporated portions of Contra Costa County; and to the south by unincorporated portions of Contra Costa County (see Figure 1). The site is identified by Assessor's Parcel Numbers (APNs) 057-042-006 and 057-050-021.

The project site is bordered by the City of Antioch/Contra Costa County line to the south. The City of Antioch/City of Brentwood limit is further east of the site (see Figure 2). Sand Creek is located along the northern border of the site, and State Route (SR) 4 is located approximately 1.44 miles east of the site. The project site is situated within the Sand Creek Focus Area of the General Plan, which contains lands designated by the Antioch General Plan for open space, residential, commercial, and mixed-use development. Per the City's General Plan, the majority of the site is designated Hillside, Estate and Executive Residential/Open Space, while the western portion of the site, alongside Deer Valley Road, is designated Commercial/Open Space. The site is zoned Study District.

The project site is generally rectangular, with the southern, western, and eastern boundaries linear, and the northern property line meandering in and out as it follows Sand Creek towards the respective property corners as show in Figure 2. Currently, the project site is undeveloped, consisting primarily of dry-farmed wheat, regularly disked, with native grassland areas and non-native vegetation. A reach of Sand Creek extends through the western portion of the project site, with an existing culvert under an unimproved private access road.

The topography of the site is defined by two large knolls within the western and northeastern portions of the site. Elevations on the project site range from approximately 324 feet above mean sea level (msl) at the top of the western knoll, to 175 feet at the southeastern corner of the site. It should be noted that currently, 16.5-foot-wide and 10-foot-wide utility easements are located parallel to each other along the site's western boundary. In addition, a second pair of utility easements extends from Deer Valley Road diagonally toward the southern site boundary.

Surrounding Land Uses

As shown in Figure 2, the majority of the surrounding area has been approved for residential development. Within the City of Antioch, the area to the north of the site is approved for development with the Aviano Project, the area to the northeast of the site is approved for development with the Promenade/Vineyard at Sand Creek Project, and the area to the east is approved for development for the Creekside/Vineyards at Sand Creek Project. Surrounding existing uses include single-family residential development located west of the site, across Deer Valley Road, and CCCFCD infrastructure, Upper Sand Creek Basin (Basin), and Antioch School District to the north. The CCCFCD's Basin is owned in fee title by the CCCFCD and includes additional CCCFCD rights-of-way in the form of easements along the Basin's south and east side. An existing Pacific Gas and Electric Company (PG&E)-owned parcel with an electrical substation, designated Public/Quasi Public per the General Plan, is located northeast of the site. The area south of the site is undeveloped, consisting of dry farmland outside the City's Sphere of Influence and Planning Area, within unincorporated Contra Costa County.

Project Components

The proposed project would include development of a single-family residential subdivision with 294 units, as well as recreational amenities and associated improvements (see Figure 3). The proposed project would also include future development of an assisted living facility and neighborhood commercial development upon issuance of a CUP.

Figure 1
Regional Project Location

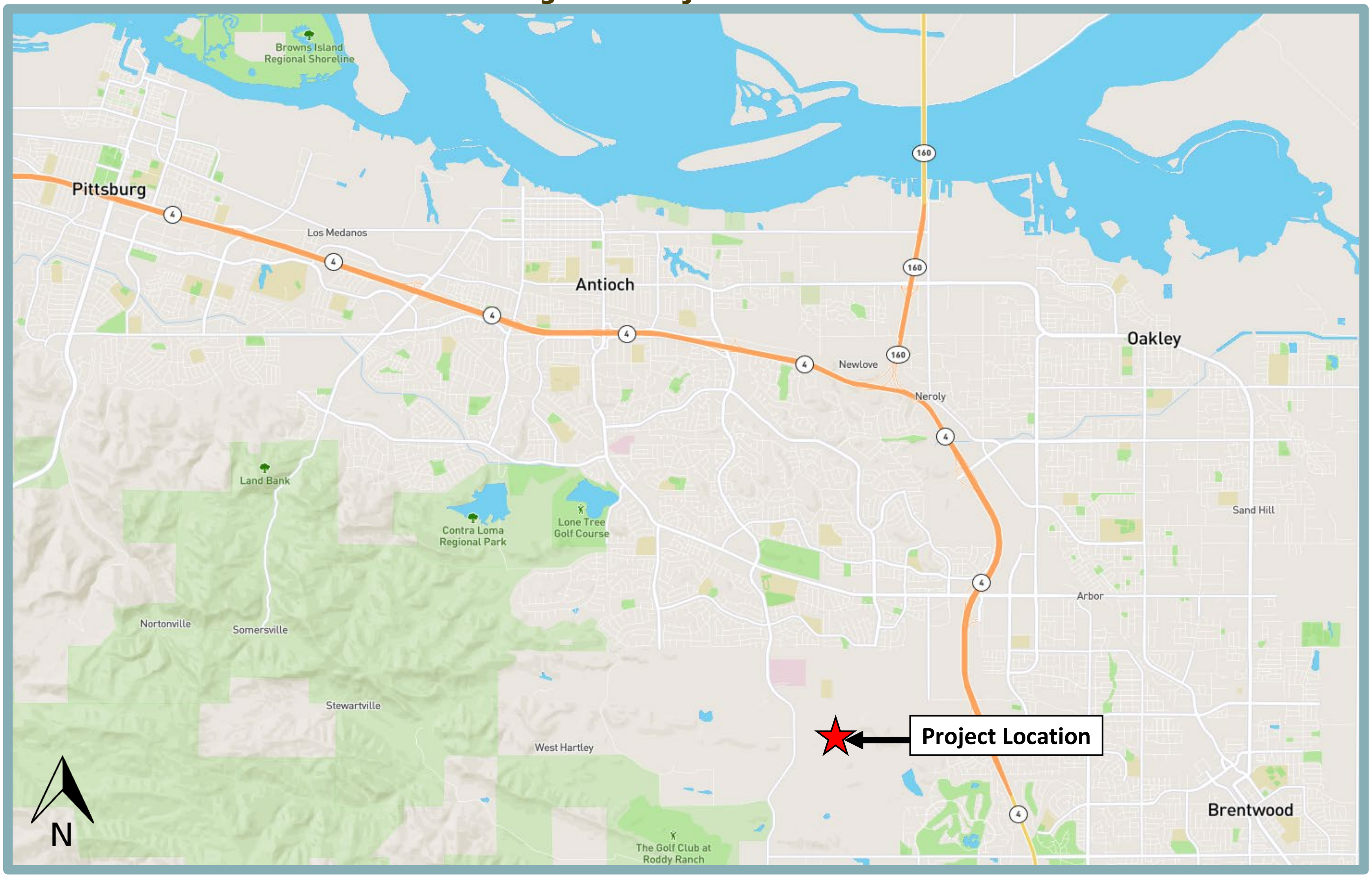


Figure 2
Project Location

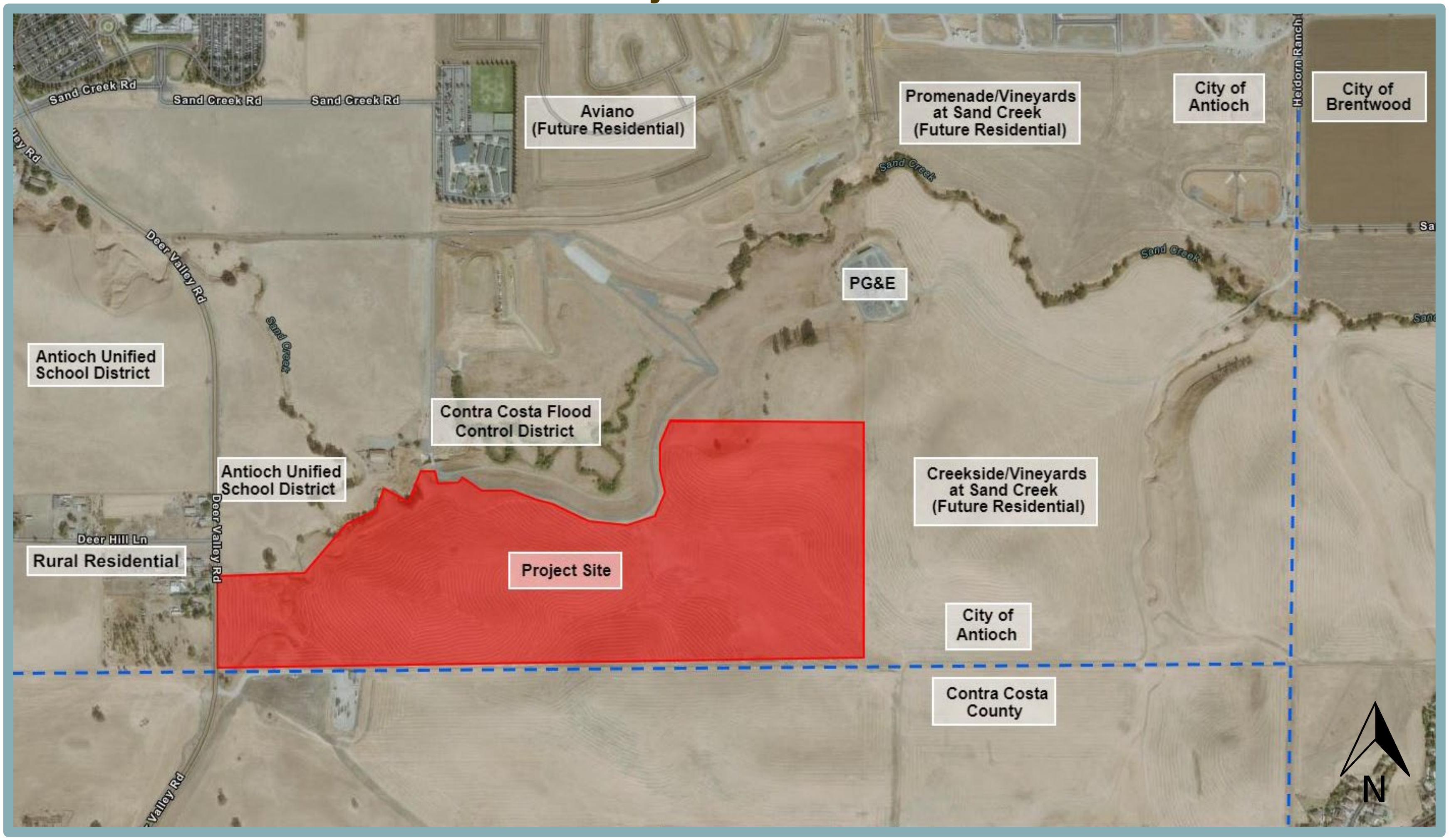
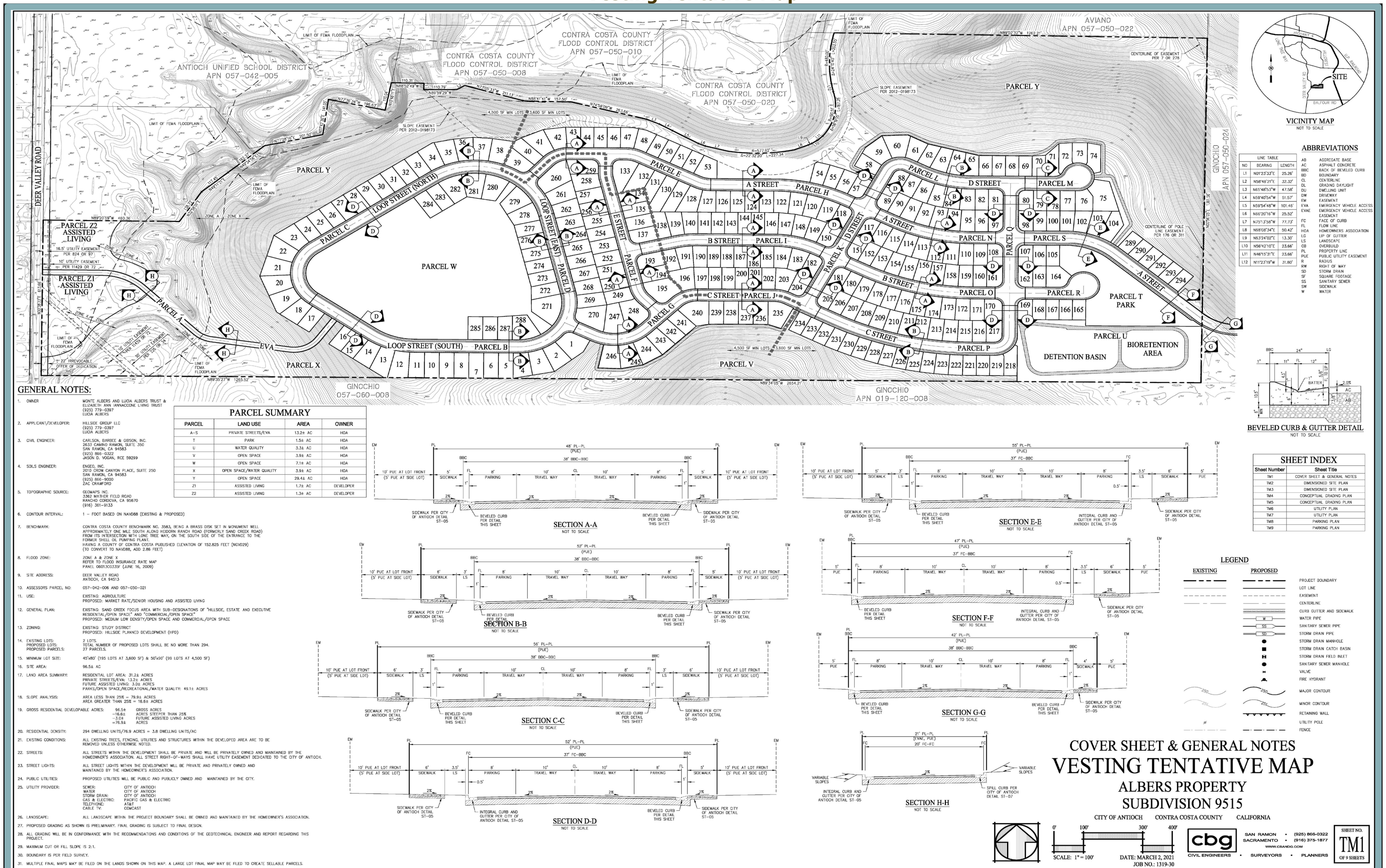


Figure 3
Vesting Tentative Map



Development of the single-family residential subdivision, assisted living facility, and neighborhood commercial land uses, including proposed roadways, would total approximately 47.4 acres. The remaining 49.1 acres of the site would be retained as open space.

The project would require City approval of the following: General Plan Amendment, Master Development Plan/Rezone, and Vesting Tentative Subdivision Map. A Development Agreement is also requested by the applicant. The details of the proposed project, including required approvals, are described in further detail below.

General Plan Amendment

The proposed project would include a General Plan Amendment to the land use map for the Sand Creek Focus Area of the General Plan to change the portion of the site currently designated Hillside, Estate and Executive Residential/Open Space to Medium Low Density Residential/Open Space. The western portion of the site; designated Commercial/Open Space, will retain the existing designations. The proposed project would also include a General Plan Amendment to the text of the Sand Creek Focus Area of the General Plan in order to add a sub area to the Sand Creek Focus Area called the Albers Ranch Sub Area.

Master Development Plan/Rezone/Development Agreement

The proposed project would require approval of a rezone to change the zoning designation of the site from Study District to HPD, subject to a Master Development Plan. The Master Development Plan and HPD district would list the development standards applicable to the project site, including setbacks, lot sizes, and building heights for the single-family residential subdivision. The future assisted living facility and neighborhood commercial land uses would be required to comply with the Zoning Ordinance. In addition, the applicant is requesting City approval of a Development Agreement, which would assure the City that the proposed project would proceed to its completion in compliance with the plans submitted by the applicant, and assure the applicant of vested rights to develop the project.

Vesting Tentative Subdivision Map

The proposed project would include a Vesting Tentative Subdivision Map (see Figure 3) to subdivide the project site into 294 single-family lots. Of the 96.5-acre site, only 79.9 acres are considered developable due to site constraints (e.g., slopes greater than 25 percent), three acres of which are proposed for future development of an assisted living facility and neighborhood commercial land uses. Approximately 31.2 acres are proposed for development of single-family residential lots, 13.2 acres would be developed with private streets, and 49.1 acres would be used for parks, open space, recreation, and water quality/detention purposes. Table 1 provides a summary of the proposed land uses.

Table 1
Proposed Land Uses

Proposed Land Use	Parcels	Acreage
Single-Family Residential	-	31.2
Private Streets/EVA	A-S	13.2
Parks/Open Space/Recreational/Water Quality	T, V, W, X, Y, U	49.1
Future Assisted Living Facility and Neighborhood Commercial	Z1, Z2	3.0
Total	**--**	**96.5**

The areas to remain open space would include the hillside within the northeastern portion of the site, the hillside along the center of the southern site boundary, the upper reaches of the existing knoll within the western portion of the site, and a setback between the future development parcels and the proposed homes.

Single-Family Residential

The proposed single-family residential uses would represent a continuation of other planned development in the project vicinity. The average density of the proposed residential development would be approximately 3.8 dwelling units per acre (294 units/76.9 acres of developable land). Six different models, each with three different elevations, would be constructed. Residential lot sizes would generally transition from larger sizes within the eastern portion of the site, closer to the Creekside/Vineyards at Sand Creek Project, to slightly smaller sizes within the western portion of the site ranging from a minimum of 3,600 square feet (sf) to a maximum of 9,000 sf.

Access and Circulation

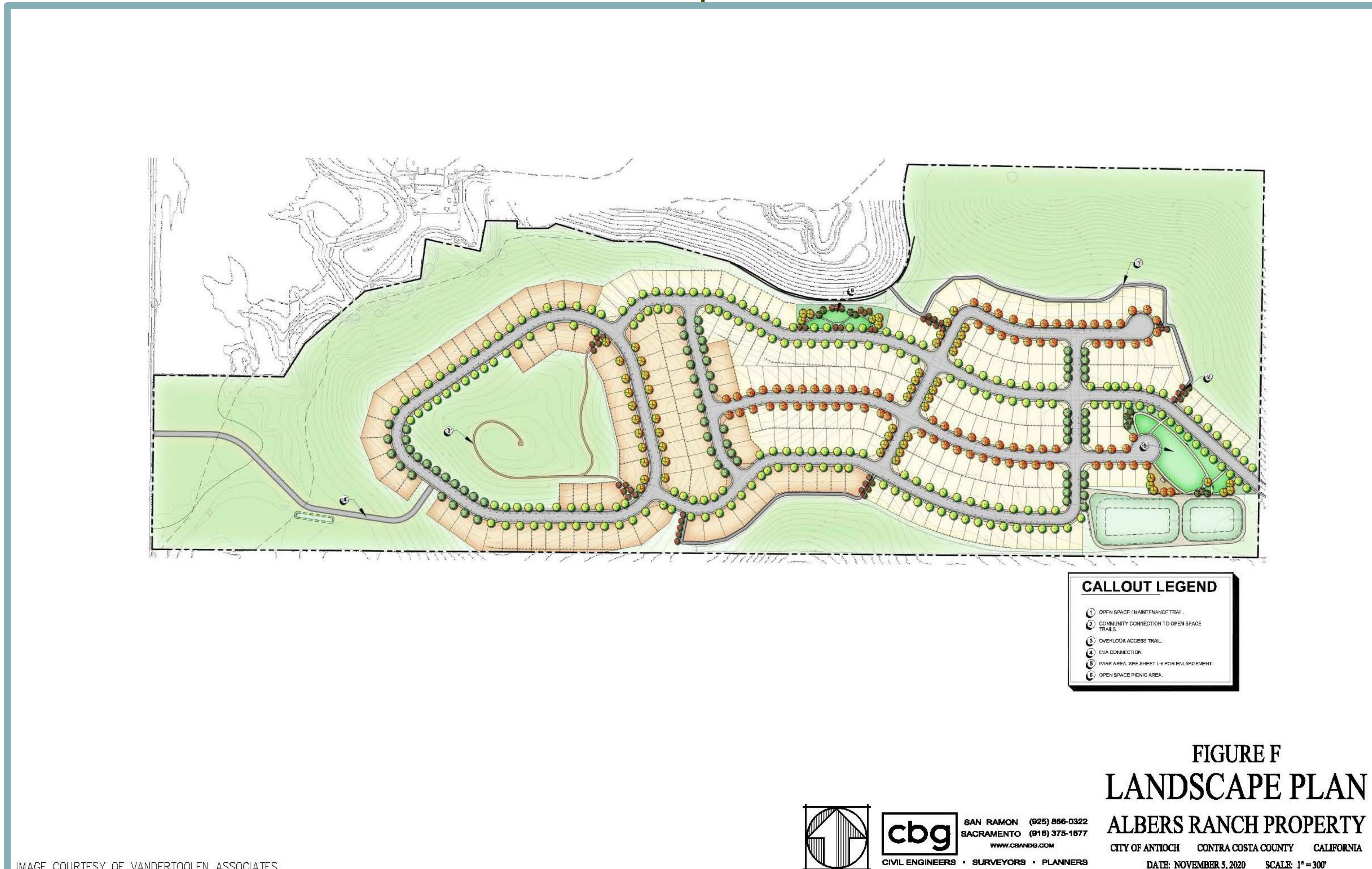
The area to the east of the site is planned for future development with the Creekside/Vineyards at Sand Creek Project, which would include extension of a new roadway, Hillcrest Avenue, to the eastern site boundary. Primary access to the proposed project would be provided by a new on-site roadway connecting to the planned Hillcrest Avenue extension east of the site. The connection to Hillcrest Avenue is contingent upon construction of the Creekside/Vineyards at Sand Creek Project. In the event that the Creekside/Vineyards at Sand Creek Project is not constructed, access to the proposed project may be provided by an alternate roadway connecting the northern portion of the project site to the future Sand Creek Road included as an Irrevocable Offer of Dedication (IOD) as part of the Aviano Project. If the developer desires the optional roadway for development, the developer would need to acquire a portion of the right-of-way from the CCCFCD in order to construct the optional road. The sale of right-of-way is at the CCCFCD discretion. An emergency vehicle access (EVA) only roadway would provide secondary access from Deer Valley Road to the western portion of the project site. The EVA would follow the existing alignment of the unimproved private access road over a culvert. Within the project site, all proposed internal streets would be private and would be consistent with applicable City of Antioch design standards. Parking would be allowed on both sides of the internal roadways, providing for a total of 362 spaces. In addition, two covered garage parking spaces would be provided within each residential unit, providing a total of 588 spaces.

Parks, Trails, Open Space, and Landscaping

As part of the proposed project, a total of 41.9 acres would be reserved for private parks and recreational facilities and retained as open space (see Figure 4).

Parcel T, located in the southeastern portion of the project site, would include a 1.5-acre park to provide recreational amenities for the project site. Parcel X, located south of the EVA, would be retained as open space, with a portion of the parcel to be used for water quality/bioretention purposes. Parcels V, W, and Y would be preserved as open space and would include trails accessible to future residents. Parcel V would be located on the southern border of the project site and would include an open space/maintenance trail. Parcel W is located on the western knoll of the project site surrounded by proposed residential lots and would include an overlook access trail. Parcel Y would be located along the northern portion of the project site and would also include an open space/maintenance trail.

Figure 4
Landscape Plan



The proposed project would include community trails between lots throughout the project site to provide access to the designated open space/trails in Parcels V, W, and Y. Two community trails, located north of Parcel V, would provide residential access to the designated open space/maintenance trail in Parcel V. Additionally, two community trails, east of Parcel W, would provide residential access to the overlook access trail in Parcel W.

Three community trails, located in the northeast portion of the project site, would provide residential access to the designated open space/maintenance trail in Parcel Y. The designated open space/maintenance trail in Parcel Y would provide community access to Sand Creek. The proposed project would also include an open space picnic area between lots 53 and 54 south of Sand Creek.

Landscaping features would be provided throughout the proposed development area and would conform to the requirements and provisions of Section 9-5.1001 of the City of Antioch Municipal Code. Individual residences would also be landscaped with trees, shrubs, groundcover and some lawns, and would be maintained by the individual owners. Public spaces, open spaces, and private landscaping areas would have an emphasis on drought-tolerant and adaptive plant species.

Utilities

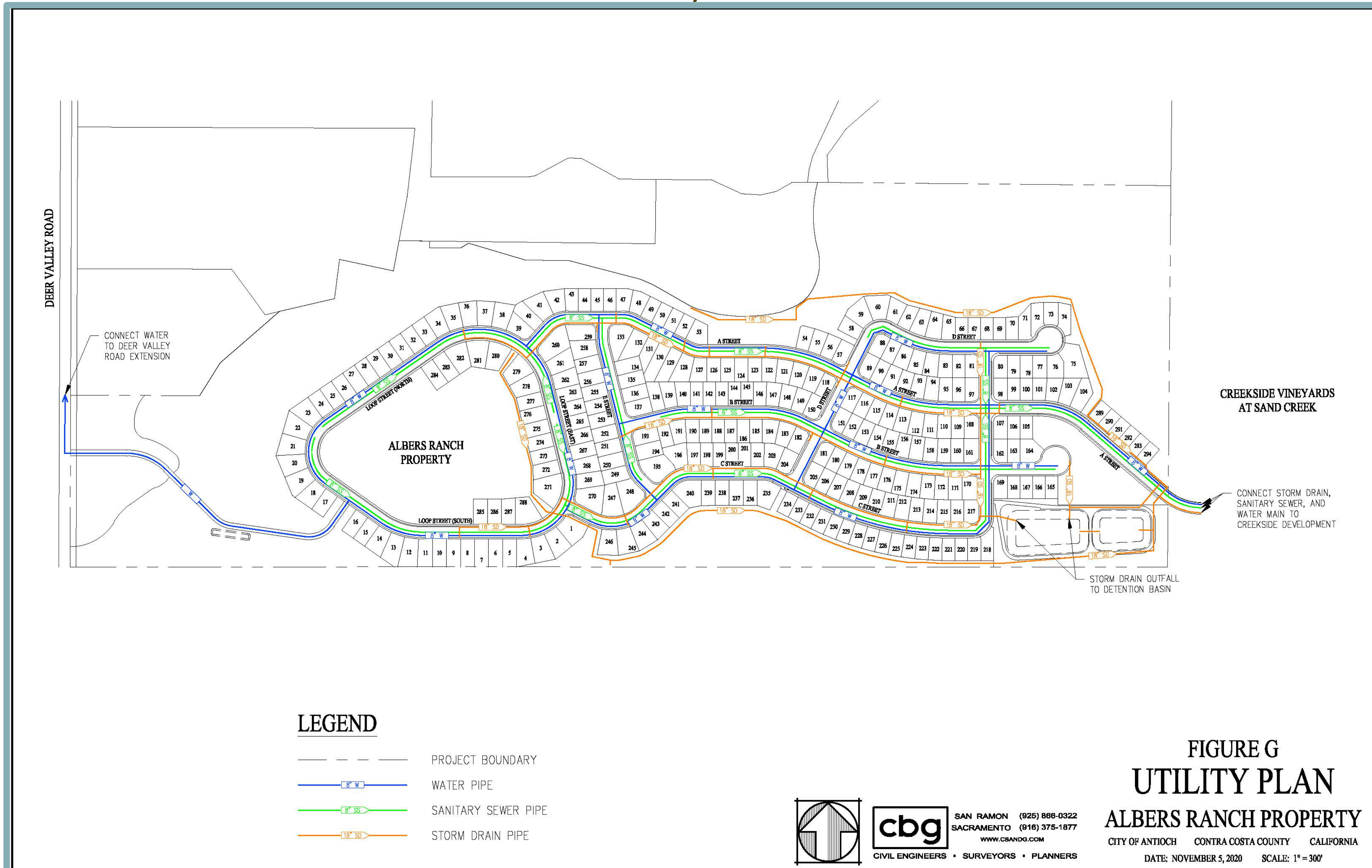
Figure 5 illustrates the proposed water, sewer, and stormwater utility improvements associated with the project.

Water supply for the proposed development would be provided by the City. Potable water would be distributed to the project site by an existing 12-inch Zone III trunk line in the future Hillcrest Avenue. The water line would continue south to I Street planned by the Creekside/Vineyards at Sand Creek Project, then head west to the proposed project boundary. The internal private streets within the proposed project would include water lines that would connect to the water line from the Creekside/Vineyards at Sand Creek Project. In addition, a water line would be undergrounded below the proposed EVA road in the western portion of the site, and follow Deer Valley Road north to connect to the City's existing water system (see Figure 5).

Wastewater conveyance for the proposed development would be provided by the City. The proposed project would include construction of sanitary sewer lines beneath the proposed private streets that would connect to I Street in the Creekside/Vineyards at Sand Creek Project. The Creekside/Vineyards at Sand Creek Project includes a main sewer line that would eventually connect to a planned sewer line in Sand Creek Road.

The project site naturally drains to the east. The proposed project would include construction of a series of drain inlets and underground storm drain pipes to capture stormwater runoff from impervious surfaces created by the project. Runoff would be routed to a detention basin and bio-retention basin located within the southeastern portion of the project site (Parcel U). The basin would provide for treatment and detention of captured stormwater runoff. The stormwater flows would be metered from the basin to match pre-development rates. A discharge line would be constructed into I Street of the Creekside/Vineyards at Sand Creek Project. The proposed EVA road in the western portion of the site would generate a relatively small amount of runoff. The runoff from the EVA road would be collected into a proposed bio-swale within Parcel X and eventually discharge through a new outfall into the unnamed reach of Sand Creek. Detention of the runoff from the EVA would not be necessary as Sand Creek drains into the Basin.

Figure 5
Utility Plan



Electricity for the proposed project would be provided by PG&E. Telecommunication services would be provided by AT&T. Comcast and Astound would provide cable television and internet services to the project site. Dry utilities, electrical, gas, and technology lines would be extended from Sand Creek Road beneath future Hillcrest Avenue to the project site.

The proposed project would not conflict with the existing utility easements located along the site's western boundary or southwestern portion of the site.

Off-Site Improvements

As noted above, should the Creekside/Vineyards at Sand Creek Project not be developed, an alternative roadway to the north may be constructed as part of the proposed project. Figure 6 below illustrates the proposed alternative roadway connection configuration. As shown in the figure, the alternative roadway would connect the northern portion of the site to the future Sand Creek Road, following the eastern boundary of the CCCFCD property and Basin and crossing Sand Creek. Any roadway and associated grading of the alternate roadway near the Basin's main damn and/or saddle dike would require discretionary approval from the California Division of Safety of Damns (DSOD). In addition, the project applicant would be required to obtain a CCCFCD encroachment permit for any work planned within the CCCFCD right-of-way. The optional roadway was included as part of the Aviano Project and has been analyzed within the associated EIR.

Project Construction

All project improvements, including off-site improvements, are anticipated to be built over two phases. While detailed phasing information is not available at this time, each phase would involve development of single-family homes arranged into several neighborhoods.

Project grading would be balanced on-site with import/export minimized to the extent feasible. Final grading is dependent on utility configurations and geotechnical considerations. While portions of the open space areas would not be subject to ground disturbances as part of the project, limited grading would be required at the western knoll within the site, along the southeastern site boundary, and along the perimeter of the lots within the northeastern portion of the site. Overall, a total of 66 acres within the project site would be subject to grading as part of the proposed project. The limits of the proposed grading activity are shown in Figure 7 and Figure 8. As shown in the figures, five-foot-tall (maximum) and 15-foot-tall (maximum) retaining walls would be required along the perimeter of the proposed lots in certain locations to accommodate the sloping topography of the site.

Future Assisted Living and Neighborhood Commercial Development

The three acres retained for future assisted living and neighborhood commercial development would consist of two parcels totaling 1.7 and 1.3 acres, respectively, located along Deer Valley Road within the western portion of the project site. Upon issuance of a CUP, the future development is anticipated to include an approximately 150-bed assisted living facility and approximately 40,000 sf of neighborhood commercial land uses. While not anticipated for development as part of the proposed project, this EIR includes analysis of the future buildout of the parcels.

Figure 6
Off-Site Improvement Area

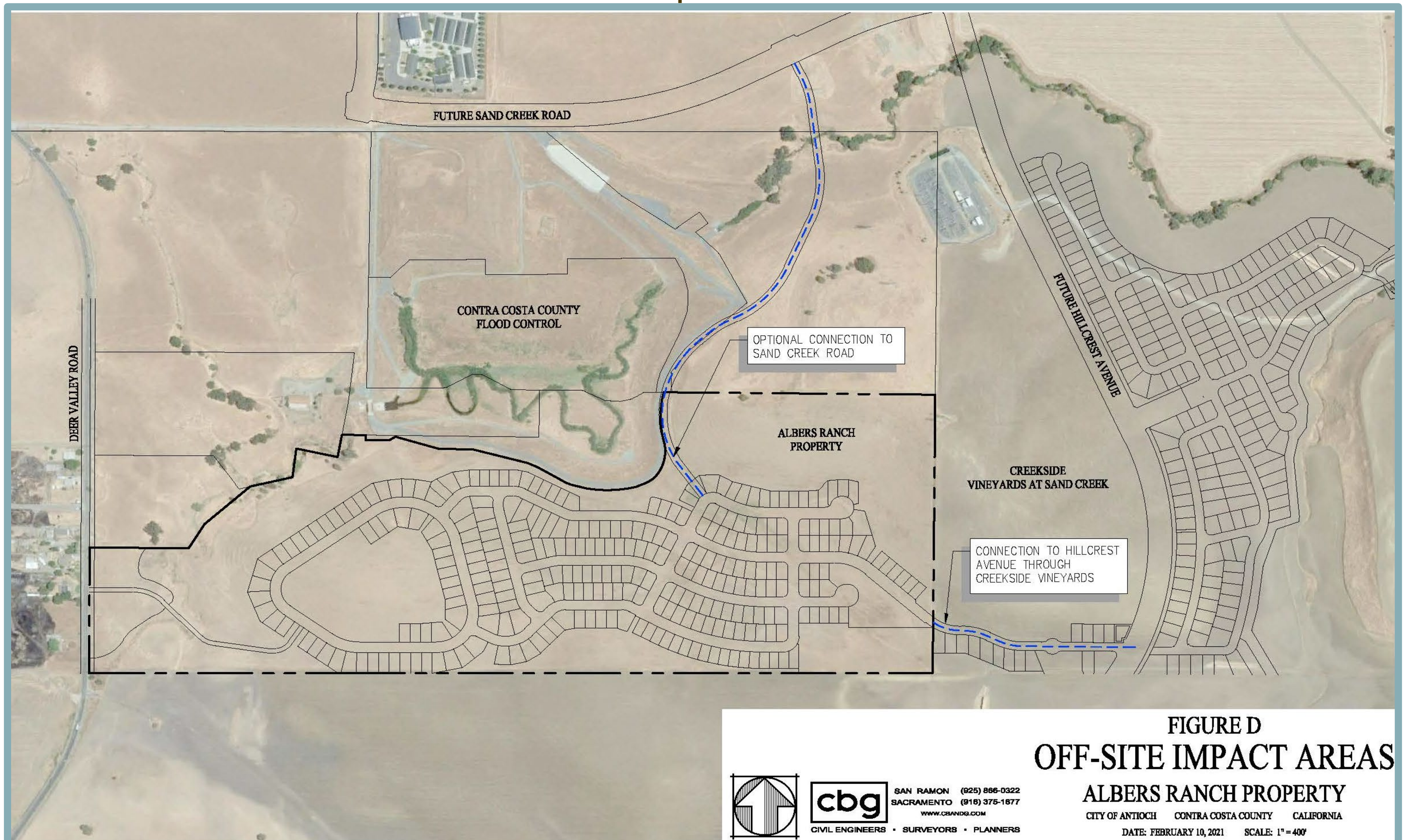


Figure 7
Conceptual Grading Plan (West)

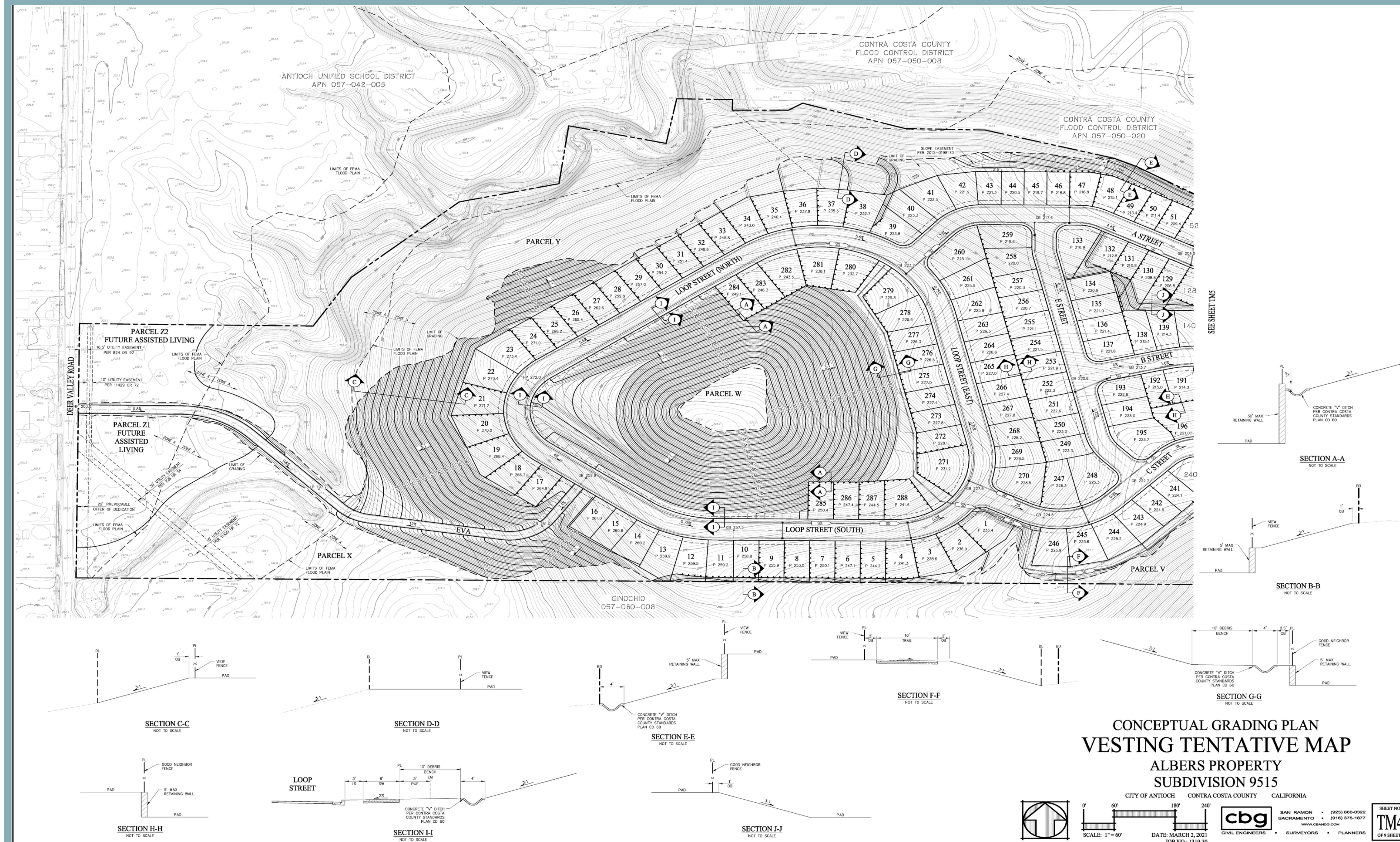
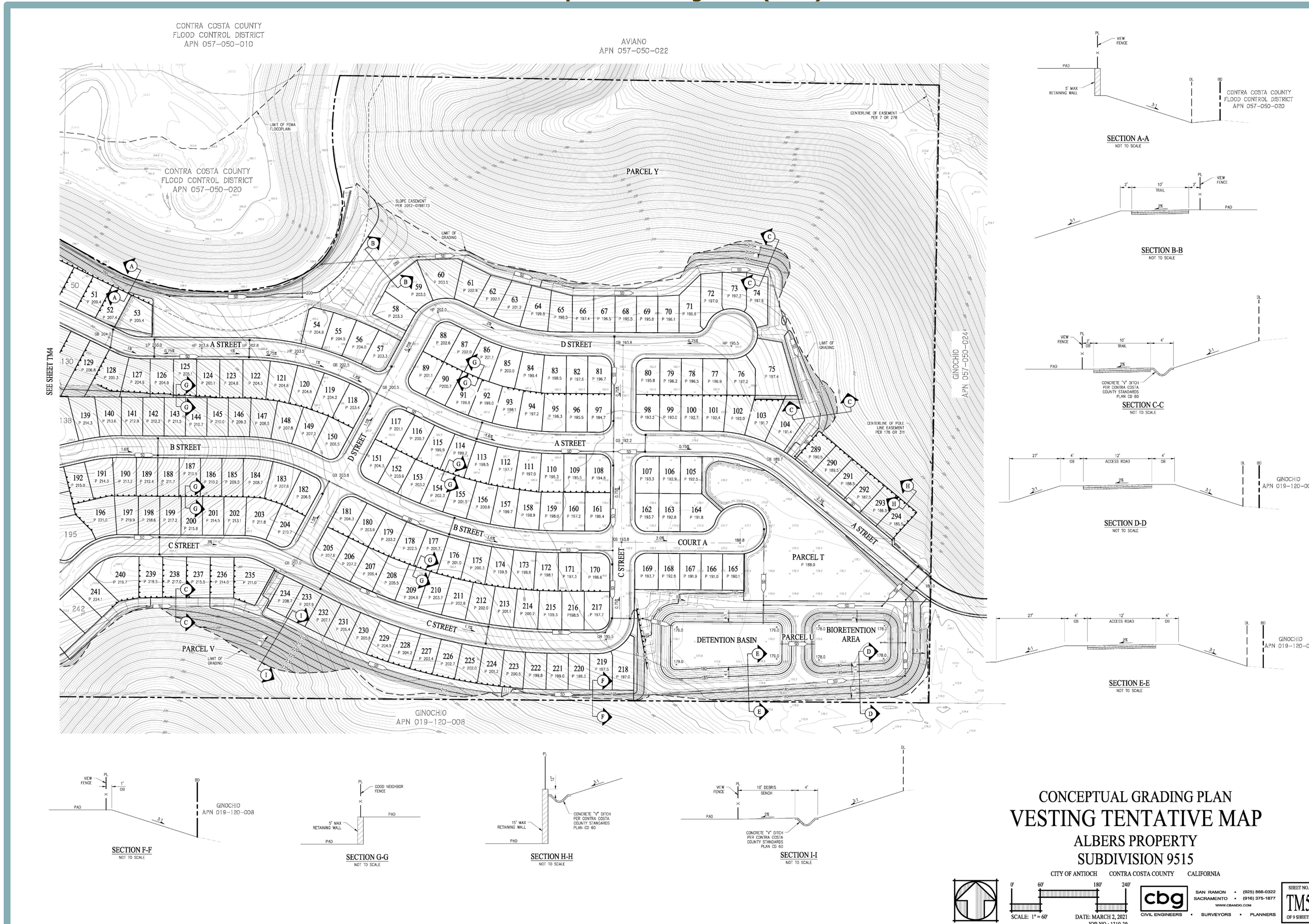


Figure 8
Conceptual Grading Plan (East)



Discretionary Actions

Implementation of the proposed project would require the following discretionary actions by the City of Antioch:

- General Plan Amendment. The proposed project would require approval of a General Plan text and map amendment to the Sand Creek Focus Area of the General Plan to change the land use designations of the site from Hillside, Estate and Executive Residential/Open Space and Commercial/Open Space to Medium Low Density Residential/Open Space and Commercial/Open Space. A text amendment to the Sand Creek Focus Area of the General Plan would also be required to add the Albers Ranch Sub Area to the Sand Creek Focus Area.
- Master Development Plan/Rezone/Development Agreement. The proposed project would require a rezone from Study District to HPD. HPD would include development standards for the single-family residential portion of the project. The Development Agreement would allow the City and the applicant to enter into an agreement to assure the City that the proposed project would be completed in compliance with the plans submitted by the applicant, and assure the applicant of vested rights to develop the project.
- Vesting Tentative Subdivision Map. The proposed project would require approval of a VTM for the subdivision of the project site into multiple parcels to accommodate 294 single-family residential units, a parcel for a potential future assisted living facility and neighborhood commercial land uses, and recreation, parks, and open space.
- Resource Management Plan. Pursuant to Section 4.4.6.7(t) of the City of Antioch General Plan, the applicant will prepare a Resource Management Plan for City approval.

G. ENVIRONMENTAL CHECKLIST

The following Checklist contains the environmental checklist form presented in Appendix G of the CEQA Guidelines. The checklist form is used to describe the impacts of the proposed project. A discussion follows each environmental issue identified in the checklist. Included in each discussion are project-specific mitigation measures recommended, as appropriate, as part of the proposed project.

For this checklist, the following designations are used:

Potentially Significant Impact: An impact that could be significant, and for which no mitigation has been identified. If any potentially significant impacts are identified, an EIR must be prepared.

Less Than Significant with Mitigation Incorporated: An impact that requires mitigation to reduce the impact to a less-than-significant level.

Less-Than-Significant Impact: Any impact that would not be considered significant under CEQA relative to existing standards.

No Impact: The project would not have any impact.

I. AESTHETICS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?	☐	☐	✖	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	☐	☐	✖	☐
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	✖	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	✖	☐

Discussion

a,b. Examples of typical scenic vistas would include mountain ranges, ridgelines, or bodies of water as viewed from a highway, public space, or other area designated for the express purpose of viewing and sightseeing. In general, a project's impact to a scenic vista would occur if development of the project would substantially change or remove a scenic vista. The City's General Plan does not specifically identify any scenic vistas.

According to the California Scenic Highway Mapping System, the proposed project site is located approximately 14 miles northeast of the nearest State Scenic Highway, Interstate 680 (I-680). It should be noted that while not officially designated, SR 4, located approximately one mile east of the site, is an Eligible State Scenic Highway.[1] However, the project site is not visible from SR 4 and does not contain any scenic resources such as trees, rocks, or historic buildings. SR 160 in the project region has not been designated as an official State Scenic Highway.

The proposed project site is not located within the vicinity of a designated scenic vista. Therefore, the proposed project would not have a substantial adverse effect on a scenic vista and would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway. Thus, a ***less-than-significant*** impact would occur.

c. General Plan Policy 5.4.2.c states that view corridors from public spaces to natural ridgelines and landmarks, such as Mt. Diablo and distant hills, local ridgelines, the San Joaquin River, and other water bodies (such as Sand Creek), should be preserved. Specific view corridors identified in Policy 5.4.2.c include Somersville Road, Lone Tree Way, Hillcrest Avenue, SR 4, SR 160, James Donlon Boulevard, Deer Valley Road, and Empire Mine Road. However, Policy 5.4.2.c also recognizes that new development will inevitably result in some loss of existing views.

Distinguishing between public and private views is important when evaluating changes to visual character or quality, because private views are views seen from privately-owned

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1 California Department of Transportation. *California Scenic Highway Mapping System*. Available at: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways Accessed July 2021.

land and are typically associated with individual viewers, including views from private residences. Public views are experienced by the collective public, and include views of significant landscape features and along scenic roads. According to CEQA (PRC Section 21000 et seq.) case law, only public views, not private views, are protected under CEQA. For example, in *Association for Protection etc. Values v. City of Ukiah* (1991) 2 Cal.App.4th 720 [3 Cal. Rptr.2d 488], the court determined that "we must differentiate between adverse impacts upon particular persons and adverse impacts upon the environment of persons in general. As recognized by the court in *Topanga Beach Renters Assn. v. Department of General Services* (1976) 58 Cal.App.3d 188 [129 Cal.Rptr. 739]: '[A]ll government activity has some direct or indirect adverse effect on some persons. The issue is not whether [the project] will adversely affect particular persons but whether [the project] will adversely affect the environment of persons in general.'" Therefore, the focus in this section is on potential impacts to public views.

Currently, rural single-family residences are located west of the project site, across Deer Valley Road. The area to the north and northeast of the project site is currently undergoing development with residential uses as part of the Aviano residential project and Promenade/Vineyards at Sand Creek Project, respectively. In addition, the area to the east of the site is approved for the Creekside/Vineyards at Sand Creek Project, which is anticipated to be at least partially developed prior to the proposed project. Thus, the visual character of the surrounding area will change substantially prior to construction of the proposed project. Nonetheless, consistent with CEQA Guidelines, the conditions at the time of the release of the Notice of Preparation have been used as the baseline conditions for analysis within this Initial Study.

Due to the topography of the project site and distance from SR 4, the proposed development would not affect views of Mount Diablo and the surrounding ridgelines as seen from SR 4 or other existing public roadways. Existing sensitive public viewers in the surrounding area primarily consist of motorists traveling on Deer Valley Road located west of the site. Given that Deer Valley Road does not include sidewalks or paved shoulders within the vicinity of the project site, pedestrian and bicycle traffic on the roadway is limited. Figure 9 and Figure 10 provide examples of typical existing views towards the project site from Deer Valley Road. As shown in the figures, views toward the site are of open grassland with some trees and vegetation associated with Sand Creek and the unnamed reach of San Creek in the foreground. The most prominent feature visible from Deer Valley Road towards the project site is the on-site western knoll in the midground. The background consists of rolling hills.

The proposed project would change the visual character and quality of the site from a vacant, undeveloped lot to a single-family residential subdivision. However, with development of the proposed project, approximately 49.1 acres of the project site, including the hillside within the northeastern portion of the site, the hillside along the center of the southern site boundary, the upper reaches of the existing knoll within the western portion of the site, and a setback between the future development parcels and the proposed residences would be preserved as open space as part of the project. The majority of development would be located in the eastern portion of the site, away from views afforded by the Deer Valley Road corridor. Thus, until the future assisted living and neighborhood commercial development area is built out, the existing foreground views offered from Deer Valley Road would remain unchanged, with the exception of the proposed EVA connecting to Deer Valley Road.

Figure 9
Existing View from Deer Valley Road Looking Southeast

Figure 10
Existing View from Deer Valley Road Looking Northeast

Although residences located on a lower portion of the western knoll would likely be visible in the midground, because the upper reaches of the knoll would remain as open space, the knoll would still be a prominent feature in the midground. In addition, because the hillsides within the northeastern portion of the site and along the center of the southern site boundary would be retained, views of the rolling hills in the background may remain visible. The existing vegetation along Sand Creek and the on-site reach of Sand Creek, as well as the open space area in the western portion of the site, would help to screen views of the proposed residences from Deer Valley Road.

While the proposed project would require approval of a rezone to change the zoning designation of the project site from Study District to HPD, the site has been previously anticipated for development with residential uses by the City and associated impacts to aesthetic resources have been evaluated in the General Plan EIR; the proposed project would not conflict with applicable zoning standards and other regulations governing scenic quality. The proposed HPD zoning designation would be subject to a Master Development Plan, which would list the development standards applicable to the project site, including setbacks, lot sizes and building heights for the single-family residential subdivision. The future assisted living facility and neighborhood commercial land uses would be required to comply with the Zoning Ordinance. In addition, the project would be subject to Design Review by the City of Antioch per Section 9-5.2607 of the Municipal Code. The purpose of the Design Review process is to promote the orderly development of the City, encourage high-quality site design and planning, protect the stability of land values and investments, and ensure consistency with the Citywide Design Guidelines Manual. The Design Review process would help to ensure that the proposed project would be visually compatible with the other currently approved projects in the vicinity. A CUP and Design Review would be required for the future development area, subject to additional project-specific environmental review at that time, which would also be required to comply with the Citywide Design Guidelines Manual.

The City's General Plan includes specific policies related to preservation of visual quality within hillside areas, including Policies 5.4.14a, 5.4.14b, 5.4.14c, 5.4.14d, 5.4.14e, and 5.4.14f. The proposed Albers Ranch Sub Area text for the GPA includes Hillside Design Policies, which are consistent with the policies of the City's General Plan. Per General Plan Policy 5.4.14b, projects within hillside areas must be designed to protect important natural features and to minimize the amount of grading. The following grading guidelines are provided:

- Slopes less than 25%: Redistribution of earth over large areas may be permitted.
- Slopes between 25% and 35%: Some grading may occur, but landforms need to retain their natural character. Split-level designs and clustering are encouraged as a means of avoiding the need for large padded building areas.
- Slopes between 35% and 50%: Development and limited grading can occur only if it can be clearly demonstrated that safety hazards, environmental degradation, and aesthetic impacts will be avoided. Structures shall blend with the natural environment through their shape, materials and colors. Impact of traffic and roadways is to be minimized by following natural contours or using grade separations. Encouraged is the use of larger lots, variable setbacks and variable building structural techniques such as stepped or post and beam foundations are required.
- Slopes greater than 50%: Except in small, isolated locations, development in areas with slopes greater than 50% should be avoided.

Approximately 93.5 percent of the proposed grading would occur on slopes of 25 percent or less, and approximately 6.2 percent of the grading area would occur on slopes between 25 and 35 percent. Areas in which grading would occur on slopes between 35 and 50 percent would be limited to approximately 0.2 acres, while grading on slopes greater than 50 percent would not occur. The steepest areas of grading would generally be located in the area around the western knoll of the project site and the northeastern portion of the project site. Such grading activity would be necessary to ensure the stability of the existing hill forms, and would not adversely affect the visual character or quality of the project site. Thus, the proposed project would be generally consistent with applicable General Plan policies related to hillside grading.

Additionally, the project site would be rezoned to HPD, which is intended to promote a more harmonious visual and functional relationship between the natural and built environments of the City. The proposed project would be required to comply with Article 24 of the Antioch Zoning Code, which provides standards related to hillside development within the HPD district.

Based on the above, impacts related to degrading the existing visual character of the site and its surroundings or a conflict with applicable zoning and other regulations governing scenic quality would be ***less-than-significant***.

d. The project site is currently undeveloped, and, thus, does not contain any existing sources of light or glare. Implementation of the proposed project would develop the site with residential buildings, and, thus, would introduce new sources of light and glare where none currently exists. Potential sources of light and glare associated with the proposed project would include interior light spilling through windows, exterior lighting on homes, street lighting on the internal street system, and light reflected off windows. While the site does not currently contain sources of light or glare, all components of the proposed project would be subject to Design Review by the City of Antioch to ensure light and glare do not obstruct day or nighttime views in the area. Citywide design guidelines for landscaping, common space, and lighting prohibit the use of flood lights to light entire structures or yards and state that any exterior night lighting installed shall be of a low intensity, low-glare design, and shall be hooded to direct light downward onto the subject parcel and prevent spillover onto adjacent parcels.[2] Compliance with such standards would ensure that on-site lighting would be directed within the project site and would not substantially illuminate adjacent properties. In addition, the proposed site layout would cluster the majority of development within the eastern portion of the site and provide a buffer between the proposed residences and the future development area. Thus, until the future development area is built out, a substantial open space buffer would exist between Deer Valley Road and the nearest residence. Given the clustering of the proposed residential development, and the added assurance of the Design Review process, implementation of the project would result in a ***less-than-significant*** impact with respect to creating a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

[2] City of Antioch. *Citywide Design Guidelines Manual* [pg 6-43]. October 2009

II. AGRICULTURE AND FOREST RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	✖	☐
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	✖
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	✖
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	✖
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	✖	☐

Discussion

a,e. The project site is currently undeveloped. Per the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP), the site is currently designated as "Farmland of Local Importance" and "Grazing Land".[3] The site does not contain Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Furthermore, the site is not zoned or designated in the General Plan for agriculture uses. Given the FMMP designations of the site, development of the proposed project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use, or otherwise result in the loss of Farmland to non-agricultural use. Therefore, the proposed project would have a ***less-than-significant*** impact.

b. The proposed project site is not under a Williamson Act contract and is not designated or zoned for agricultural uses.[4] Therefore, buildout of the proposed project would not conflict with existing zoning for agricultural use or a Williamson Act contract, and ***no impact*** would occur.

c,d. The project area is not considered forest land (as defined in PRC Section 12220[g]), timberland (as defined by PRC Section 4526), and is not zoned Timberland Production (as defined by Government Code Section 51104[g]). Therefore, the proposed project would have ***no impact*** with regard to conversion of forest land or any potential conflict with forest land, timberland, or Timberland Production zoning.

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3 California Department of Conservation. *California Important Farmland Finder.* Available at: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed July 2019.

4 Contra Costa County Department of Conservation and Development. *2016 Agricultural Preserves Map.* February 1, 2017.

III. AIR QUALITY. *Would the project:*	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	✖	☐	☐	☐
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	✖	☐	☐	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	✖	☐	☐	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	✖	☐	☐	☐

Discussion

a-d. The City of Antioch is located in the San Francisco Bay Area Air Basin (SFBAAB), which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The SFBAAB area is currently designated as a nonattainment area for State and federal ozone, State and federal fine particulate matter 2.5 microns in diameter ($PM_{2.5}$), and State respirable particulate matter 10 microns in diameter (PM_{10}) ambient air quality standards (AAQS). The SFBAAB is designated attainment or unclassified for all other AAQS. It should be noted that on January 9, 2013, the U.S. Environmental Protection Agency (USEPA) issued a final rule to determine that the Bay Area has attained the 24-hour $PM_{2.5}$ federal AAQS. Nonetheless, the Bay Area must continue to be designated as nonattainment for the federal $PM_{2.5}$ AAQS until such time as the BAAQMD submits a redesignation request and a maintenance plan to the USEPA, and the USEPA approves the proposed redesignation.

In compliance with regulations, due to the nonattainment designations of the area, the BAAQMD periodically prepares and updates air quality plans that provide emission reduction strategies to achieve attainment of the AAQS, including control strategies to reduce air pollutant emissions through regulations, incentive programs, public education, and partnerships with other agencies. The current air quality plans are prepared in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG).

During construction of the project, various types of equipment and vehicles would temporarily operate on the project site. Construction exhaust emissions would be generated from construction equipment, demolition, grading, construction worker commutes, and construction material hauling for the entire construction period. The aforementioned activities would involve the use of diesel and gasoline powered equipment that would generate emissions of criteria pollutants. Project construction activities also represent sources of fugitive dust, which includes PM emissions. As construction of the proposed project would generate air pollutant emissions intermittently within the site, and the vicinity of the site, until all construction has been completed, construction is a potential concern because the proposed project is in a non-attainment zone for ozone and PM.

Furthermore, development of the proposed project would result in an increased number of vehicle trips associated with traffic to and from the project site. Operation of the proposed project would result in emissions associated with area sources such as gas combustion from heating mechanisms and landscape maintenance equipment. The additional traffic and operations associated with the proposed project could result in increases in criteria pollutant emissions above thresholds established by the BAAQMD. Therefore, the proposed project could violate an air quality standard or result in a cumulatively considerable net increase of any criteria pollutant, and thus, may conflict with or obstruct implementation of the applicable air quality plan.

The major pollutants of concern are localized carbon monoxide (CO) emissions and toxic air contaminant (TAC) emissions. Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. Implementation of the proposed project could increase traffic volumes on streets near the project site. Because the proposed project could cause an increase in the localized CO concentrations in the project vicinity, and would involve temporary TAC emissions associated with construction, the proposed project could expose sensitive receptors to substantial pollutant concentrations.

Accordingly, the proposed project could result in a ***potentially significant*** impact related to air quality.

Further analysis of this impact will be discussed in the Air Quality and Greenhouse Gas Emissions chapter of the Albers Ranch EIR being prepared for the project.

IV. BIOLOGICAL RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	✖	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	✖	☐	☐
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	✖	☐	☐
d. Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?	☐	☐	✖	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	✖	☐	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	✖

Discussion

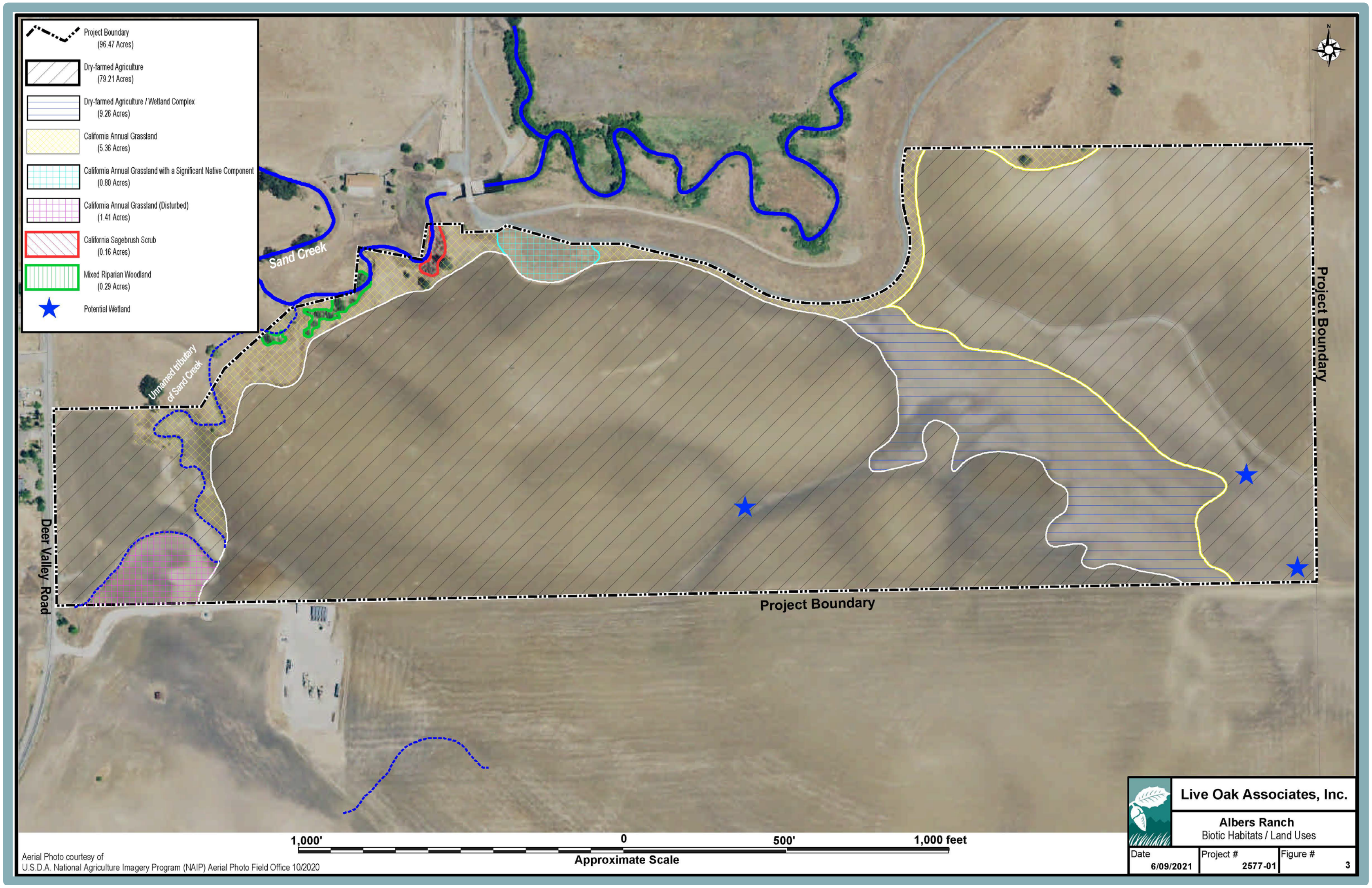
a. The following discussion is based primarily on a Technical Biological Report prepared for the proposed project by Live Oak Associates, Inc. (see Appendix A).[5]

Currently, the project site is undeveloped, and consists primarily of dry-farmed wheat with some native grassland areas and a portion of the Sand Creek riparian area, a tributary to Marsh Creek, in the western portion of the site. Hydrological features were identified on-site, including the channels of Sand Creek and its unnamed tributary, as well a potential wetland occurring in the eastern portion of the site (see Figure 11). In addition, mixed riparian habitat occurs along the southern banks of the unnamed tributary to Sand Creek.

The Technical Biological Report was prepared in order to address the potential for the proposed project to result in a substantial adverse effect to any special-status species which occupy, or have the potential to occupy, the project site. Special-status species include those plant and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal and State Endangered Species Acts. Both acts afford protection to listed and proposed species. In addition, California Department of Fish and Wildlife (CDFW) Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern, sensitive species included in USFWS Recovery Plans, and CDFW special-status invertebrates are all considered special-status species.

5 Live Oak Associates, Inc. *Albers Project Site, Technical Biological Report, Antioch, California.* August 9, 2021.

Figure 11
Biotic Habitats and Land Uses



Although CDFW Species of Special Concern generally do not have special legal status, they are given special consideration under CEQA. In addition to regulations for special-status species, most birds in the U.S., including non-status species, are protected by the Migratory Bird Treaty Act (MBTA) of 1918. Under the MBTA, destroying active nests, eggs, and young is illegal. In addition, plant species on California Native Plant Society (CNPS) Lists 1 and 2 are considered special-status plant species and are protected under CEQA.

As part of the Technical Biological Report prepared for the proposed project, Live Oak Associates, Inc. conducted a search of published records of special-status plant and wildlife species for the Antioch South United States Geological Survey (USGS) 7.5" quadrangle, in which the project site occurs, and for the eight surrounding quadrangles, using the California Natural Diversity Data Base (CNDDB) Rarefind 5 application. The intent of the database review was to identify documented occurrences of special-status species in the vicinity of the project area, to determine their locations relative to the project site, and for use in the field assessment to identify habitats suitable for special-status species within the site. Additional sources of information used for the analysis include *Listed Plants and Listed Animals* (USFWS 2021), *State and Federally Listed Endangered and Threatened Animals of California* (CDFW 2021), *The California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2021), *California Bird Species of Special Concern* (Shuford and Gardall 2008), and *California Amphibian and Reptile Species of Special Concern* (Thompson et al. 2016). It should be noted that plant and wildlife species that are not considered special-status, as defined above, were excluded from the analysis, as such species are not protected under CEQA.

After completing the database review, a field survey of the project site was conducted by Live Oak Associates, Inc. on May 24, 2021. The results of the CNDDB search, the site survey, and other queries conducted as part of the Technical Biological Report are discussed below.

Special-Status Plants

Based on the results of the CNDDB search and the CNPS nine-quadrangle search, a total of 44 special-status plant species have been recorded within the project region. However, most special-status plant species known to occur, or to once have occurred, in the project region are considered absent from the site due to the absence of suitable habitat. For instance, several of the listed species require the presence of serpentine soils or inland dunes, neither of which are provided on the project site. Additionally, several species are considered absent from the site because the species is a perennial shrub or herb that would have been observed if present during the May 2021 site survey. Several other special-status plant species identified in the CNDDB and CNPS search are considered unlikely to occur on-site considering that habitats on-site are extremely limited (e.g., grasslands occurring at the margins of the wheat field) or extremely marginal (e.g., due to decades of agricultural disturbances in the region). In addition, the special-status plant species may not be known to occur in the project vicinity (e.g., within a three-mile radius) and/or have not been observed in many decades in the project region.

However, the site does provide potential habitat for 12 special-status species. The soils of the project area are alkaline, and grasslands occurring at the edges of the wheat fields on alkaline soils, and/or wetlands occurring on alkaline soils, may provide potential habitat for several special-status plant species including: Contra Costa goldfields, alkali milk-vetch, heartscale, brittlescale, lesser saltscale, dwarf downingia, Jepson's coyote-thistle, shining navarretia, bearded popcornflower, California alkali grass, and long-styled sand-spurrey. Additionally, the San Joaquin spearscale has been observed on-site in two different locations in the past.

Given that the site includes habitat that is suitable for the aforementioned species, development of the proposed project could adversely affect special-status plant species. Without focused floristic surveys during the appropriate blooming season in all potentially suitable habitats, a potentially significant impact could occur.

Special-Status Wildlife

Based on the results of the CNDDB search, a total of 38 special-status wildlife species occur, or once occurred, within the project area. Of the 38 species, 21 would be considered absent or unlikely to occur on-site due to lack of suitable habit for the species. The remaining 17 special-status wildlife species may be foragers or transients to the site, may be residents of the site, or may occur within areas adjacent to the site. Because bats were not observed during reconnaissance surveys, and on-site trees do not support suitable roosting habitat for bats, any special-status bat species in the project area are expected to forage on-site only. As a result, impacts to special-status bats are hereby dismissed from further discussion. Therefore, the proposed project has the potential to result in adverse impacts to the following species: nesting migratory birds and raptors, including Swainson's hawk, white-tailed kite, northern harrier, golden eagle, burrowing owl, short-eared owl, loggerhead shrike, and grasshopper sparrow; vernal pool fairy shrimp; vernal pool tadpole shrimp; California tiger salamander; California red-legged frog; western pond turtle; American badger; and San Joaquin kit fox. Each species is further evaluated below.

Nesting Migratory Birds and Raptors

Building of the project during the nesting period for migratory birds (i.e., typically between February 1 to August 31), including initial site grading, soil excavation, and/or tree and vegetation removal, could pose a risk of nest abandonment and death of any live eggs or young that may be present nesting within or near the site. The existing trees and riparian habitat within the project site may support nesting migratory birds and raptors, including the Swainson's hawk, white-tailed kite, northern harrier, golden eagle, burrowing owl, short-eared owl, loggerhead shrike, and grasshopper sparrow, as discussed in further detail below.

Swainson's Hawk

Swainson's hawk is a State-listed threatened species afforded protection pursuant to the California Endangered Species Act. The species is protected from direct take under the federal MBTA. The Swainson's hawk inhabits open to semi-open areas at low to middle elevations in valleys, dry meadows, foothills, and level uplands. The species nests almost exclusively in trees and will nest in almost any tree species that is at least 10 feet tall. Nests are constructed in isolated trees that are dead or alive along drainages and in wetlands, or in windbreaks in fields and around farmsteads. Swainson's hawks occasionally nest in shrubs, on telephone poles, and on the ground. Foraging habitats include alfalfa fields, fallow fields, beet, tomato, and other low-growing row or field crops, dry-land and irrigated pasture, and rice land when not flooded. During the nesting season, Swainson's hawks usually forage within two miles of their nests.

According to the Technical Biological Report, the trees along the margin of the site support suitable nesting habitat while the remainder of the site supports foraging habitat for the Swainson's hawk. In addition, 30 documented sightings of the hawk have occurred within a 10-mile radius of the project site, with the closest observation being within 0.25-mile of the site. Therefore, the Swainson's hawk is known to nest and forage within the area, and has the potential to occur on-site. The loss of Swainson's hawk individuals would constitute a significant impact under CEQA. Thus, the development of the proposed project could result in a potentially significant impact to Swainson's hawk.

White-Tailed Kite

The white-tailed kite is a "Fully Protected" species under the California Fish and Game Code (CFGC) and is protected under the federal MBTA. The white-tailed kite is typically found foraging in grassland, marsh, or cultivated fields with dense-topped trees or shrubs for nesting and perching. The species nests in a wide variety of trees of moderate height and occasionally in tall bushes, such as coyote bush. Although the surrounding terrain may be semi-arid, the species often resides near water sources, where prey is more abundant. The particular characteristics of the nesting site do not appear to be as important as its proximity to a suitable food source.

The trees along Sand Creek provide potentially suitable nesting habitat for the species. If white-tailed kite nests are present in the project area, disturbance associated with project construction could result in nest abandonment, loss of young, or reduced health and vigor of eggs and/or nestlings and could ultimately result in the take of nestling or fledgling white-tailed kites. Therefore, a potentially significant impact to the species could occur.

Northern Harrier

The northern harrier is designated as a California species of special concern. The northern harrier occurs in grasslands, seasonal marshes, and some agricultural habitats. Northern harrier individuals have not been recorded within the project area. However, suitable habitat for the species may occur within the project site. Therefore, the potential exists for northern harrier to reside and/or nest within the project area. If northern harrier nests are present in the project area, disturbance associated with project construction could result in nest abandonment, loss of young, or reduced health and vigor of eggs and/or nestlings and could ultimately result in the take of nestling or fledgling northern harriers. Thus, the proposed project could result in a potentially significant impact to the northern harrier.

Golden Eagle

The golden eagle is designated as a California species of special concern and is fully protected under the Bald and Golden Eagle Protection Act. Golden eagles are found breeding throughout western North America in remote open habitats. Typical habitats in North America include savannah woodland habitats, grasslands, aspen parkland, high and low deserts, and in taiga habitats. Golden eagles nest from January until September, with peak nesting occurring in March through July. Golden eagles are very sensitive to disturbance near the nest site, particularly in remote regions where human activities are minimal.

Golden eagles have been identified nesting in a bluegum eucalyptus growing along the bank of Sand Creek. If an active nest is identified within the zone of project influence the year that construction commences, project construction could result in impacts or deleterious disturbance to the nesting golden eagles. Specifically, disturbance could result in nest abandonment, loss of young, or reduced health and vigor of eggs and/or nestlings and could ultimately result in the take of nestling or fledgling golden eagles. Accordingly, a potentially significant impact to the species could occur.

Burrowing Owl

The burrowing owl is a California species of special concern. Burrowing owl habitat is usually found in annual and perennial grasslands, characterized by low-growing vegetation. Often, the burrowing owl utilizes rodent burrows, typically California ground squirrel burrows, for nesting and cover. The species may also on occasion dig their own burrows or use man-made objects such as concrete culverts or rip-rap piles for cover.

According to the Technical Biological Report, the site contains ground squirrel burrows, indicative of suitable habit for the burrowing owl. Should site demolition or grading occur during nesting season for the species (February 1 through August 31), nests and nestlings that may be present would likely be destroyed. Overwintering burrowing owls may also be buried in their roost burrows outside of the nesting season (September 1 through January 31). Any actions related to site development that result in the mortality of burrowing owls would constitute a violation of the federal MBTA and provisions of the CFGC and would constitute a significant impact under CEQA. Thus, the development of the proposed project could result in a potentially significant impact to the burrowing owl.

Short-Eared Owl

The short-eared owl is designated as a California species of special concern. The species requires dense ground cover to conceal nests, and typically occurs in wide open spaces including marshes, open shrublands, grassland, prairie, and agricultural field habitats. Short-eared owl individuals have not been recorded within three miles of the project site; however, suitable habitat for the owl occurs within the project site. Therefore, the potential exists for short-eared owls to reside and/or nest within the project area. If short-eared owl nests are present in the project area, disturbance associated with project construction could result in nest abandonment, loss of young, or reduced health and vigor of eggs and/or nestlings and could ultimately result in the take of nestling or fledgling short-eared owl individuals. Thus, the proposed project could result in a potentially significant impact to the short-eared owl.

Loggerhead Shrike

The loggerhead shrike is a California species of special concern and is protected from direct take under the MBTA. In addition, the loggerhead shrike’s nest, eggs, and young are protected under CFGC Sections 3503, 3503.5, and 3800. The shrike is a small bird of open and often arid habitats, and prefers areas various perching locations. The loggerhead shrike preys upon insects and small birds, mammals, amphibians, reptiles, and aquatic species. The species typically constructs a stick nest on a stable branch in a densely foliated tree or shrub. The conversion of rural areas into subdivisions or commercial areas steadily reduces the available habitat for the loggerhead shrike.

Ruderal habitat and the riparian woodland provide suitable hunting grounds for loggerhead shrikes and, as a result, the trees on and immediately adjacent to the project site along Sand Creek provide potentially suitable nesting habitat. If loggerhead shrike nests are present in the project area, disturbance associated with project construction could result in nest abandonment, loss of young, or reduced health and vigor of eggs and/or nestlings and could ultimately result in the take of nestling or fledgling loggerhead shrike individuals. Thus, the development of the proposed project could result in a potentially significant impact to the loggerhead shrike.

Grasshopper Sparrow

The grasshopper sparrow is designated as a California species of special concern. The grasshopper sparrow occurs in California during the spring and summer, and is found in open grassland with scattered shrubs. Grasshopper sparrow individuals have not been recorded within three miles of the project site; however, marginal suitable breeding habitat for the sparrow occurs within the project site. Therefore, the potential exists for the grasshopper sparrow to reside and/or nest within the project area. If grasshopper sparrow nests are present in the project area, disturbance associated with project construction could result in nest abandonment, loss of young, or reduced health and vigor of eggs and/or nestlings and could ultimately result in the take of nestling or fledgling grasshopper sparrow individuals. Thus, the proposed project could result in a potentially significant impact to the grasshopper sparrow.

Vernal Pool Fairy Shrimp

Vernal pool fairy shrimp was designated as threatened in the species' entire range on September 19, 1994. Critical habitat for the species was designated on August 6, 2003. The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. The species tends to occur in smaller pools (less than 0.05-acre) that are most commonly found in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands. The shrimp has also been collected in large vernal pools (e.g., 25 acres).

The project site has the potential to support vernal pool fairy shrimp, as a seasonal wetland complex in the eastern portion of the site is capable of supporting vernal pool branchiopods. Thus, the development of the proposed project could result in a potentially significant impact to the vernal pool fairy shrimp.

Vernal Pool Tadpole Shrimp

Vernal pool tadpole shrimp live in season pools that dot the grasslands of the Central Valley. Water in the pools is clear to murky, and the pools range from 55 square feet to almost 90 acres.

The project site has the potential to support vernal pool tadpole shrimp as a seasonal wetland complex in the eastern portion of the site is capable of supporting vernal pool branchiopods. Therefore, the development of the proposed project could result in a potentially significant impact to the vernal pool tadpole shrimp.

California Tiger Salamander

The California tiger salamander is a federally-listed threatened species. California tiger salamanders occur in grasslands and open oak woodlands that provide suitable over summering and/or breeding habitats. California tiger salamanders spend the majority of their lives underground. The species typically only emerge from their subterranean refugia for a few nights each year during the rainy season to migrate to breeding ponds. Adult California tiger salamanders have been observed up to 1.3 miles from breeding ponds. As such, unobstructed migration corridors are an important component of California tiger salamander habitat.

According to the Technical Biological Report, Sand Creek and the seasonal wetlands on and adjacent to the site support potentially suitable breeding habitat for the California tiger salamander. Impacts to individual California tiger salamander or known breeding pools is considered a significant impact under CEQA. As a result, implementation of the proposed project could result in a potentially significant impact to California tiger salamander.

California Red-Legged Frog

The California red-legged frog was federally-listed as threatened on May 23, 1996 and is protected pursuant to the Federal Endangered Species Act. The California red-legged frog is typically found in ponds and slow-flowing portions of perennial and intermittent streams that maintain water in the summer months. The species is also found in hillside seeps that maintain pool environments or saturated soils throughout the summer months. Populations likely cannot be maintained if all surface water disappears (i.e., surface water is not available for egg laying and larval development habitat). Larval California red-legged frogs require 11 to 20 weeks of deep water to reach metamorphosis, in water depths of 10 to 20 inches. Riparian vegetation such as willows and emergent vegetation such as cattails are preferred red-legged frog habitats, though not necessary for the species to be present. California red-legged frogs also use upland habitats for migration and dispersal. The USFWS' Recovery Plan for the California Red-Legged Frog states that frog's overland excursions through uplands can vary between 0.25-mile up to three miles during the course of a wet season, and frogs "have been observed to make long-distance movements that are straight-line, point to point migrations rather than using corridors for moving in between habitats".

According to the Technical Biological Report, potentially suitable habitat for the California red-legged frog is present within the project site in the form of riparian habitat associated with Sand Creek as well as the tributary of Sand Creek in the western portion of the project site. The California red-legged frog may also be expected to move out of the riparian area onto the upland portion of the site. Injury or mortality of an individual California red-legged frog would be considered a significant impact under CEQA. As a result, implementation of the proposed project could result in a potentially significant impact to California red-legged frog.

Western Pond Turtle

The western pond turtle is a California "species of special concern." The western pond turtle is a habitat generalist, inhabiting a wide range of fresh and brackish, permanent and intermittent water bodies from sea level to approximately 4,500 feet mean sea level (msl). Typically, the species is found in ponds, marshes, ditches, streams, and rivers with rocky or muddy bottoms. The species is most often found in aquatic environments with plant communities dominated by watercress, cattail, and other aquatic vegetation. The species usually only leaves the aquatic site to reproduce and to overwinter. Western pond turtles may overwinter on land or in water or may remain active in water during the winter season, depending on latitude, water temperature, and habitat type. The western pond turtle also requires upland areas for burrowing habitat, where the species digs nests and buries its eggs. Such nests can extend from 52 feet to 1,219 feet from watercourses; however, most western pond turtles' nest in uplands within 250 meters (820 feet) of water. Upland nest sites are usually found in areas with sparse vegetation. Sunny, barren, and undisturbed (not disked) land provides optimal habitat, while shady riparian habitat and planted agricultural fields do not provide suitable habitat.

According to the Technical Biological Report, the proposed project would result in the loss of a small area of upland habitat for western pond turtles. Impacts to the western pond turtle habitat would be considered minimal. However, the western pond turtle could move into the construction zone, which may result in mortality to individual western pond turtles. The loss of individual western pond turtles would constitute a significant impact under CEQA. As a result, implementation of the proposed project could result in a potentially significant impact to western pond turtle.

American Badger

American badger is a California "species of special concern." The species is found in a variety of habitats, especially in open habitats such as oak-savannah and grasslands where the species' presence is typically identified by distinctive, large underground dens (burrows) excavated in friable (loose) soils. The nocturnal mammal is rarely observed during field surveys.

According to the Technical Biological Report, suitable habitat for the American badger occurs on-site, and American badger individuals have been observed in the project vicinity. During the site visit in May of 2021, badgers or badger burrows were not observed on-site. However, should badgers occur on-site at the time of construction, the proposed project could result in the morality of individuals of the species, which would constitute a significant impact under CEQA. Thus, the development of the proposed project could result in a potentially significant impact to the American badger.

San Joaquin Kit Fox

The San Joaquin kit fox is a federally- and State-listed endangered species. The San Joaquin kit fox live primarily in the lowlands of the San Joaquin Valley of California, but are also known to occur in several counties in the coast mountain ranges, including Santa Barbara, San Luis Obispo, Monterey, San Benito, Santa Clara, Contra Costa, and Alameda counties. The species is usually found in open grassland and shrub land communities, but has also been observed in ruderal plant communities.

According to the Technical Biological Report, the project site supports marginal habitat for the San Joaquin kit fox as it has been highly modified for agricultural use (e.g., dryland farmed) and the site sits on the western edge of development in the region of Antioch. While an extensive survey for burrows was not completed, suitable burrows were not detected. In fact, the San Joaquin kit fox have not been observed in the region for more than 25 years. Therefore, the site supports only marginal foraging and dispersal habitat for the kit fox. However, if the species was detected prior to construction, site development could result in harm or injury to an individual kit fox, and a potentially significant impact could occur.

Off-site Improvement Area

Should the Creekside/Vineyards at Sand Creek Project not be developed, an alternative access roadway may be constructed as part of the proposed project. The alternative roadway would connect the northern portion of the site to the future Sand Creek Road, following the eastern boundary of the CCCFCD property and Basin and crossing Sand Creek. The optional roadway was included as part of the Aviano Project and has been analyzed within the associated EIR. Accordingly, should the alternative access roadway be constructed as part of the proposed project, the project applicant would be required to comply with all applicable mitigation measures related to the roadway set forth in the EIR prepared for the Aviano Project.

Conclusion

Based on the above, implementation of the proposed project could potentially affect special-status plant species, golden eagle, Swainson's hawk, burrowing owl, and other nesting migratory birds and raptors, including the white-tailed kite, northern harrier, short-eared owl, loggerhead shrike, and grasshopper sparrow, as well as vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, California red-legged frog, western pond turtle, American badger, and the San Joaquin kit fox.

Thus, the proposed project could have an adverse effect, either directly or through habitat modifications, on species identified as special-status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS, and a ***potentially significant*** impact could result.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level. It should be noted that in July 2007, the East Contra Costa County (ECCC) Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) was adopted by Contra Costa County, other member cities, the USFWS, and the CDFW. The City of Antioch, however, declined to participate in the HCP/NCCP. Nonetheless, the mitigation measures below include language to reflect the possibility that the City may, in the future, enter into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP covered species or otherwise adopt a different HCP/NCCP.

Special-Status Plants

IV-1. *Prior to initiation of ground-disturbing activities on the project site and off-site improvement areas, the project applicant shall retain a qualified biologist to conduct focused botanical surveys for Contra Costa goldfields, alkali milk-vetch, heartscale, brittlescale, lesser saltscale, dwarf downingia, Jepson's coyote-thistle, shining navarretia, bearded popcirnflower, California alkali grass, long-styled sand spurrey, San Joaquin spearscale, and all plants that are considered locally rare as listed in the East Bay Chapter of the CNPS Database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties for the Marsh Creek/Lone Tree Valley area. Project construction shall not be initiated until all special-status plant surveys are completed and the mitigation is implemented, if necessary and required prior to starting construction.*

A special-status plant survey report that includes the methods used, survey participants, and associated findings shall be prepared and submitted to the City no more than 30 days following the completion of the final site visit. A record of any special-status plant species identified within the project site during the preconstruction surveys shall be submitted to the CNDDB. If new special-status plant populations are not found on the site during the appropriately timed surveys, additional mitigation is not required. If construction is not started within two years after the rare plant surveys are completed, the City may require additional rare plant surveys.

If special-status plants are observed on the site during the survey, the populations shall be avoided to the maximum degree possible during project development, and a Mitigation and Monitoring Plan shall be prepared detailing the measures to be implemented to avoid the plant population. Measures shall include establishment of appropriate buffers during construction, fencing of the population prior to and during construction, and regular monitoring of the preserved population by a biologist during and after construction activities. The Mitigation and Monitoring Plan shall be implemented prior to the initiation of project grading. If the plant populations cannot be avoided, the applicant shall hire a qualified biologist to prepare a seed collection and replanting plan in coordination with the City of Antioch to reduce impacts to the identified special-status plant populations, subject to review and approval by the City of Antioch Community Development Department.

Swainson's Hawk

IV-2(a). *Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if a Swainson's hawk is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.*

IV-2(b) *Prior to any project-related ground disturbance that occurs during the nesting season (March 15th to September 15th) within a half-mile of a potential nest tree, a qualified biologist shall conduct preconstruction surveys within the construction zones and adjacent lands to identify any nesting pairs of Swainson's hawks within 14 days prior to the onset of ground disturbance. Preconstruction surveys are not required for construction activities located farther than a half-mile from a potential nest tree. Surveys shall follow the protocol in the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000), including the survey period lengths identified therein. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department.*

If active nests are not found during preconstruction surveys, further mitigation is not necessary. If any active nests are discovered in or near proposed construction zones, the qualified biologist shall establish a suitable construction-free buffer around the active nest site. The buffer shall be identified on the ground with flagging or fencing and shall be maintained until the qualified biologist has determined that the young have fledged.

As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1) *Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by*

the East Contra Costa County Habitat Conservancy (Conservancy), provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCCHCP/NCCP Covered Species; or

2) Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and FWS have approved the conservation plan.

Golden Eagle

IV-3(a). *Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if a golden eagle is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.*

IV-3(b). *Prior to initiation of ground-disturbing activities or tree removal, preconstruction surveys shall be conducted concurrently with the preconstruction surveys for Swainson's hawk nests as required by Mitigation Measure IV-2(b) above. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department.*

If no active nesting golden eagles are identified during survey(s), project construction may commence without further regard for protection of nesting eagles. If active nesting golden eagles are identified during the preconstruction surveys within a half-mile of the site and within the line of sight from disturbance to the nest site, biological monitors shall monitor the nest in order to establish baseline behavioral data. Based on the baseline behavioral data and location of the nest (i.e., whether the nest is remote or in/close to town, and whether existing disturbances are present), a construction-free buffer shall be established. The construction-free buffer shall be a minimum of 800 feet and can be increased based on the biological monitor's observations of the behavior at the nest. Project-related disturbance shall not be allowed within any established buffer until the biologist has determined that the young have fledged.

Burrowing Owl

IV-4(a). *Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if a burrowing owl is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.*

IV-4(b). Prior to initiation of ground-disturbing activities, a preconstruction survey for burrowing owls shall be conducted. The CDFG's Staff Report on Burrowing Owl Mitigation (CDFG 2012) states that take avoidance (preconstruction) surveys shall be conducted within 14 days prior to ground disturbance. As burrowing owls may recolonize a site after only a few days, time lapses between project activities trigger subsequent take avoidance surveys, including, but not limited to, a final survey conducted within 24 hours prior to ground disturbance to ensure absence of the species. Surveys shall ensure 100 percent visual coverage. The results of the survey shall be submitted to the City of Antioch Community Development Department.

If burrowing owls or fresh sign of burrowing owls are not observed during preconstruction surveys, further mitigation is not required and construction may proceed. If burrowing owls or their recent sign are detected on the site, occupied burrows shall be identified by the monitoring biologist and a construction-free buffer (up to 250 feet) shall be established and maintained until a qualified biologist has determined the burrowing owl has abandoned the burrow.

Nesting Migratory Birds, Including Nesting Raptors and Protected Birds

IV-5(a). Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if an active bird nest is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.

IV-5(b). Prior to commencement of ground-disturbing activities or tree removal during the breeding season (typically between February 1st and August 31st, the project applicant shall retain a qualified biologist to conduct preconstruction migratory bird and raptor nesting surveys within 14 days prior to the onset of ground disturbance. The nesting migratory bird surveys shall cover the project site and the raptor nesting surveys shall encompass the site and lands within 250 feet of the site, where accessible. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department. If nesting migratory birds or raptors are not identified during the surveys, further mitigation is not required.

If nesting migratory birds or raptors are identified during the surveys, an appropriate construction-free buffer shall be established. The actual size of the buffer, which would be determined by the qualified biologist, will depend on the species, topography, and type of activity that would occur in the vicinity of the nest. The project buffer shall be monitored periodically by the qualified biologist to ensure compliance. Construction or earth-moving activity shall not occur within the established buffer until determined by a qualified biologist that the young have fledged.

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

IV-6(a). *Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if a listed shrimp is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.*

IV-6(b). *Prior to initiation of ground-disturbing activities, to mitigate for permanent impacts to shrimp habitat, the project applicant shall preserve occupied and potentially occupied habitat at a 3:1 ratio (preserved:impacted) and create additional habitat at a 2:1 ratio (created:impacted). Preservation or created habitat shall be via the purchase of mitigation land in fee title or via recordation of a conservation easement over the mitigation land preserving it in perpetuity as wildlife habitat. The easement shall be granted to a qualified conservation organization as defined by Section 815.3 of the California Civil Code. The preserved or created habitat shall be established at least a year prior to on-site impacts to vernal pool fairy shrimp or vernal pool tadpole shrimp habitat in order to monitor the new habitat's effectiveness, including a comparison to the existing on-site habitat with regards to appropriate hydrology for shrimp. Once the determination has been made that the created habitat supports the appropriate hydrology, the top four inches of topsoil of the on-site habitat planned to be impacted can be transferred to the mitigation site in the same day. Removal and placement of this topsoil shall be done in a systematic fashion that will avoid compaction of the soil.*

Prior to the start of construction, the project applicant shall prepare and submit to the City of Antioch a Habitat Mitigation and Management Plan (HMMP), which shall outline the requirements for managing preserved areas and created areas for five years, as well as success criteria for the created habitat. The HMMP will follow the guidelines for mitigation and monitoring of vernal pools issued by the USFWS (1994). The project applicant shall also establish an endowment fund, or other funding mechanism to provide for the long-term management, maintenance, and monitoring of the mitigation site.

In lieu of the above, prior to construction, the project applicant may purchase credits at a 1:1 ratio from an approved mitigation bank.

The project applicant may satisfy the requirements of this mitigation measure by providing the City of Antioch Community Development Department with a copy of a biological opinion issued by the USFWS that includes these, or other functionally equivalent, habitat preservation measures prior to the start of construction.

As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. *Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or*
2. *Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.*

California Tiger Salamander

IV-7(a). *Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if California tiger salamander is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.*

IV-7(b) *Prior to initiation of ground-disturbing activities, a qualified biologist shall conduct a preconstruction survey of the seasonal wetlands in the eastern portion of the project site during the rainy season in order to determine whether they could be classified as breeding habitat for the California tiger salamander. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department. If breeding habitat is not identified, further mitigation is not necessary. If the seasonal wetland is determined to be breeding habitat and cannot be avoided, the project applicant shall compensate for the loss of upland habitat at a minimum of a 3:1 impacts to replacement ratio. Mitigation land shall be permanently protected land within the Central California Distinct Population Segment (DPS) range of the California tiger salamander within 1.3 miles of a known breeding site, or as otherwise approved by CDFW and USFWS. Protection shall be accomplished through the purchase of the mitigation land in fee title or via recordation of a conservation easement over the mitigation land. In lieu of this mitigation prior to construction, the project applicant may purchase California tiger salamander credits at a 1:1 ratio from an approved mitigation bank.*

In addition, if breeding habitat is planned to be removed, the applicant shall comply with the provisions of the federal Endangered Species Act and shall obtain take authorization from the USFWS for project-related losses of the California tiger salamander habitat, as required by law. To obtain a take permit, consultation with the USFWS would need to be initiated either through a federal nexus (Section 7 consultation, usually through the U.S. Army Corps of Engineers (USACE) or the Bureau of Land Management. Proof of compliance shall be submitted to the City of Antioch Community Development Department.

As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. *Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or*
2. *Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.*

California Red-Legged Frog

IV-8(a). *Prior to initiation of ground-disturbing activities on the project site and off-site improvement areas, the project applicant shall require all construction workers to attend tailgate training that includes a description of California red-legged frog and its habitat and measures to be implemented to protect the frog and minimize take if the frog is observed on or near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.*

IV-8(b). *A qualified biologist shall conduct preconstruction surveys for California red-legged frog prior to the initiation of ground-disturbing activities. If California red-legged frog are not encountered during the preconstruction surveys, further mitigation is not required. If California red-legged frog are present, they shall be relocated by the qualified biologist. The work areas shall be cleared and isolated with suitable wildlife exclusion fencing that would block the movement of California red-legged frogs from entering the work areas. A qualified biologist shall be on-site during particular times of construction to ensure California red-legged frog are not harmed, injured, or killed during project buildout.*

Upland habitats shall be managed via a long-term management plan to maintain the quality of the habitat for the movement and dispersal of California red-legged frog. Potential opportunities include, but are not limited to, enhancement of the channels and riparian corridor (e.g., formation of plunge pools), which would maximize opportunities to disperse from the ponds to even higher-quality habitat off-site.

In addition, if breeding habitat is planned to be removed, the applicant shall comply with the provisions of the federal Endangered Species Act and shall obtain take authorization from the USFWS for project-related losses, as required by law. To obtain a take permit, consultation with the USFWS would need to be initiated either through a federal nexus (Section 7 consultation, usually through the U.S. Army Corps of Engineers (USACE) or the Bureau of Land Management). Proof of compliance shall be submitted to the City of Antioch Community Development Department.

As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. *Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or*
2. *Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.*

Western Pond Turtle

IV-9(a). *Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if western pond turtle is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.*

IV-9(b). *Implement Mitigation Measures IV-8(b). If western pond turtle are observed on-site, they shall be allowed to leave the site on their own or be located by a CDFW-approved biologist. If a western pond turle nest is observed, a 50-foot construction-free buffer around the nest site shall be established and maintained until a qualified biologist determines the nest is no longer active.*

American Badgers

IV-10(a). *Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if an American badger is observed on or near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.*

IV-10(b). *The project applicant shall retain a qualified biologist to conduct a preconstruction survey to determine the presence or absence of badgers prior to initiation of ground-disturbing activities. If badgers are not identified, further mitigation is not required. If an active badger den is identified during preconstruction surveys within or immediately adjacent to an area subject to construction, a qualified biologist shall establish a construction-free buffer of up to 300 feet around the badger den. Once the biologist has determined that the badger has vacated the burrow, the burrow can be collapsed or excavated, and ground disturbance can proceed. Should the* *burrow be determined to be a natal or reproductive den, and because badgers are known to use multiple burrows in a breeding burrow complex, a biological monitor shall be present on-site during construction activities in the vicinity of the burrows to ensure that the buffer is adequate to avoid direct impact to individuals or natal/reproductive den abandonment. The monitor shall be required to be present until it is determined that the badger young are of an independent age and construction activities would not harm individual badgers. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department.*

San Joaquin Kit Fox

IV-11(a). *Prior to initiation of ground-disturbing activities, the project applicant shall require all construction workers to attend tailgate training that includes a description of the species, a brief summary of the species biology, and minimization measures and instructions of what to do if a kit fox is observed on a near the construction zone. A sign-in sheet shall be distributed to all participants of the training program and submitted, along with a written summary of the training, to the City of Antioch Community Development Department within two weeks of training completion.*

IV-11(b). *A qualified biologist shall conduct preconstruction surveys no more than 14 days prior to site grading to determine the presence or absence of kit fox. If kit fox is not identified during the surveys, further mitigation is not required. If an active kit fox den is identified during preconstruction surveys within or immediately adjacent to an area subject to construction, a qualified biologist shall establish a construction free buffer of up to 300 feet around the San Joaquin kit fox den. Once the biologist has determined that the San Joaquin kit fox has vacated the den, the den can be collapsed or excavated, and ground disturbance can proceed. Should the den be determined to be a natal or reproductive den, a biological monitor shall be present on-site during construction activities in the vicinity of the dens to ensure that the buffer is adequate to avoid direct impact to individuals or natal/reproductive den abandonment. The monitor shall be required to be present until it is determined that the young are of an independent age and construction activities would not harm individual San Joaquin kit fox. A written summary of the survey results shall be submitted to the City of Antioch Community Development Department.*

b,c. According to the Technical Biological Report, jurisdictional waters of the U.S. and State under jurisdiction of the USACE, the Regional Water Quality Control Board (RWQCB), and the CDFW are present on-site in the form of Sand Creek and the creek's unnamed tributary, which occur in the northern and western portions of the site, respectively. In addition, a small riparian woodland is present along the southern bank of both channels near the site's northern boundary, as previously described.

As currently proposed, the project would predominantly avoid impacts to the channels and associated riparian habitat as the habitats would be preserved within designated open space areas. However, an EVA road is proposed to connect to Deer Valley Road from the western portion of the site, crossing Sand Creek's unnamed channel. The proposed EVA road would follow the alignment of an existing unimproved private access road that currently crosses the tributary to Sand Creek in the western portion of the site. A culvert currently exists under the unimproved private road. Substantial grading is not proposed or anticipated to be required for placement of the EVA. The EVA road would be used by emergency vehicles only during an emergency situation, and would not be available for use by the general public. Nonetheless, depending on the design of the EVA road, construction of the EVA could result in temporary or minor permanent impacts to the channel. Therefore, construction of the EVA road through the channel could result in a significant impact to jurisdiction waters, which would require permits from applicable regulatory agencies. In addition, a new outfall into the unnamed channel is proposed associated with the proposed bio-swale within Parcel X for stormwater collected from the EVA road. A formal wetland delineation would be required to be prepared and submitted to the USACE for a Jurisdictional Determination to determine the extent of the jurisdictional status of the channel. Thus, construction of the proposed storm drainage infrastructure into the channel could result in a potentially significant impact to jurisdictional waters.

Should the Creekside/Vineyards at Sand Creek Project not be developed, an alternative access roadway may be constructed that would connect the northern portion of the site to the future Sand Creek Road, following the eastern boundary of the CCCFCD property and Basin and crossing Sand Creek. The optional roadway was included as part of the Aviano Project and has been analyzed within the associated EIR. Accordingly, should the alternative access roadway be constructed as part of the proposed project, the project applicant would be required to comply with all applicable mitigation measures related to the roadway set forth in the EIR prepared for the Aviano Project.

In addition to the channels, a fairly extensive wetland complex is present at the lower elevations of the eastern portion of the site in an area proposed for development. Three potential wetlands also occur outside of the wetland complex (see Figure 11). The wetlands appear to be isolated from other waters of the U.S. and, therefore, may not be considered jurisdictional by the USACE. However, the wetlands would likely be considered jurisdictional by the RWQCB.

Considering the above, the proposed project may result in fill or other disturbance of waters of the U.S. and/or the State. Therefore, the proposed project could have a substantial adverse effect on riparian habitat, sensitive natural communities, or State or federally protected wetlands, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

IV-12(a). *Prior to the initiation of ground-disturbing activities, the project applicant shall submit a formal wetland delineation to the USACE for verification to determine the extent of all hydrological features, their jurisdictional status, and the extent of any impacts of the currently proposed project. A summary of the wetland delineation shall be submitted to the City of Antioch Community Development Department.*

IV-12(b). *Prior to discharging any dredged or fill materials into any waters of the U.S. within the project site and/or the off-site improvement areas, the applicant shall obtain permit authorization to fill wetlands under Section 404 of the federal Clean Water Act (CWA) (Section 404 Permit) from USACE. The Section 404 Permit application shall include an assessment of directly* *impacted, avoided, and preserved acreages to waters of the U.S. Mitigation measures shall be developed as part of the Section 404 Permit to ensure no net loss of wetland function and values. Mitigation for direct impacts to waters of the U.S. within the project site and/or the off-site improvement areas would occur at a minimum of 1:1 ratio for direct impacts by purchasing seasonal wetland credits from the Cosumnes Mitigation Bank or other wetland mitigation bank that services the project site, as approved by the USACE and the RWQCB.*

Alternatively, the project applicant may create, preserve, and manage new seasonal wetlands on or off of the project site that is of equal or greater quality to the habitats being impacted at a minimum 1:1 mitigation ratio. A project-specific Wetland Mitigation and Monitoring Plan prepared by a qualified wetland restoration ecologist that includes the following information shall be provided to the City of Antioch Community Development Department prior to conducting any activity that would result in the placement of any fill material into a water of the U.S. or water of the State:

- *A description of the impacted water;*
- *A map depicting the location of the mitigation site(s) and a description of existing site conditions;*
- *A detailed description of the mitigation design that includes: (i) the location of the new seasonal wetlands; (ii) proposed construction schedule; (iii) a planting/vegetation plan; (iv) specific monitoring metrics, and objective performance and success criteria, such as delineation of created area as jurisdictional waters using USACE published methods; and (v) contingency measures if the created wetlands do not achieve the specified success criteria; and*
- *Short-term and long-term management and monitoring methods.*

If the wetland mitigation site is a separate mitigation property, the project applicant will grant a conservation easement to a qualified entity, as defined by Section 81.5.3 of the California Civil Code, preserving the created seasonal wetland(s) in perpetuity, and establish an endowment fund to provide for the long-term management, maintenance, and monitoring of the created seasonal wetland(s). If the proposed project includes placing fill material into jurisdictional waters of the U.S. or waters of the State, the project applicant shall provide the City of Antioch Community Development Department with a copy of permits issued by the USACE and RWQCB authorizing the fill.

In addition, a Water Quality Certification or waiver pursuant to Section 401 of the CWA must be obtained for Section 404 permit actions. Proof of compliance with the mitigation measure shall be submitted to the City of Antioch Community Development Department prior to the issuance of grading permits.

IV-12(c). *Impacts to riparian habitat within CDFW's Section 1602 jurisdictional areas that would occur during construction shall be mitigated through planting*

California native trees and/or shrubs within the Sand Creek buffer area. Impacted trees and shrubs shall be mitigated with a 3:1 (replacement:impacts) ratio. Replacement trees and shrubs shall be a minimum of one gallon size trees/shrub replacements.

In addition, the project applicant will implement appropriate BMPs to prevent construction related impacts that could introduce de minimus fill or other pollutants into Sand Creek and the creek's tributaries. The measures shall include the installation of wildlife-friendly hay wattles and/or silt fence that will prevent unintended de minimus fill impacts during construction activities associated with Sand Creek. In addition, orange silt fencing shall be installed at the top-of-bank of Sand Creek to prevent unintended human and equipment traffic adjacent to Sand Creek. Finally, the dripline of all protected trees within the drainages on the project site, if near work areas, shall be protected through the installation of orange construction fencing.

The project applicant shall satisfy this mitigation by providing the City of Antioch Community Development Department with a fully executed copy of a Streambed Alteration Agreement (SBAA) with the CDFW that includes these, or other functionally equivalent, BMPs, prior to any construction activities associated with Sand Creek. The project applicant shall implement the conditions of the executed SBAA.

d. Per the Technical Biological Report, the project site is not expected to act as a movement corridor. Buildout of the site would not constrain native wildlife movement, as the surrounding area is approved for buildout of single-family residential subdivisions. Most wildlife in the area would use the adjacent Sand Creek and associated tributary as a local movement corridor and would likely continue to do so in the same manner after site development. As noted above, the majority of Sand Creek and its channel would remain undisturbed in designated open spaces. As such, the project would not interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites. Thus, a ***less-than-significant*** impact would occur.

e. According to the City's Tree Preservation and Regulation Ordinance (Section 9-5.1205), tree removal for the proposed project is evaluated as part of the "regular development application process." In deciding whether to approve the removal of a tree, or require its preservation, the City considers whether the tree being evaluated is considered a landmark, indigenous, mature, or established tree. In addition, the City would evaluate the tree's appearance, species type, and aesthetic compatibility with the proposed project. The City of Antioch's Tree Preservation and Regulation Ordinance defines six categories of trees:

1. An established tree is any tree that is at least ten inches in diameter, at diameter at breast height (DBH). DBH is measured 4.5 feet above natural or finished grade.
2. An indigenous tree is a naturally growing tree of the following species: Blue Oak (*Quercus douglasii*), Valley Oak (*Quercus lobata*), Coast Live Oak (*Quercus agrifolia*), Canyon Live Oak (*Quercus chrysolepis*), Interior Live Oak (*Quercus wislizenii*), California Buckeye (*Aesculus californica*), and California Bay (*Umbellularia californica*)

3. A landmark tree is any tree that is at least 48 inches DBH and/or is over 40 feet in height.
4. A mature tree is any tree which is at least 26 inches DBH.
5. A street tree is any tree planted within a public right-of-way and/or a tree planting easement.
6. A protected tree is any tree required to be preserved as a condition of an approval from a regular development application.

The City's Tree Preservation and Regulation Ordinance requires two 24-inch box trees to replace the removal of each established tree, two 48-inch box trees for removal of each mature tree, and the City Council has discretion in determining the appropriate ratio of box tree replacement for the removal of any landmark or indigenous trees.

A tree inventory has not yet been conducted by a qualified arborist for the project site. However, trees exist on-site which may require a permit for removal. Should the project applicant fail to comply with the requirements noted above, the proposed project could conflict with local policies or ordinances protecting biological resources, including Section 9-5.1205 of the City's Municipal Code, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

IV-13. *Prior to issuance of certificates of occupancy, all trees that are legally removed as part of the proposed project shall be replaced according to the following schedule, to the satisfaction of the City of Antioch Community Development Department:*

1. *Each established tree: two 24-inch box trees.*
2. *Each mature tree: two 48-inch box trees.*

The locations and sizes of the replacement trees shall be clearly shown on the final landscape plans, subject to review and approval by the City of Antioch Community Development Department.

f. As noted previously, in July 2007, the ECCC HCP/NCCP was adopted by Contra Costa County, other member cities, the USFWS, and the CDFW. The City of Antioch, however, declined to participate in the HCP/NCCP. While the City is currently considering drafting a new HCP/NCCP, the document has not yet been finalized or adopted. Therefore, the project site is not located in an area with an approved HCP/NCCP, or local, regional, or State habitat conservation plan. As a result, ***no impact*** would occur regarding a conflict with the provisions of such a plan.

V. CULTURAL RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	✖	☐	☐
b. Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?	☐	✖	☐	☐
c. Disturb any human remains, including those interred outside of dedicated cemeteries.	☐	✖	☐	☐

Discussion

The following discussion is based on a Cultural and Paleontological Resources Inventory prepared for the proposed project by Natural Investigations Company.[6]

a-c. The Cultural and Paleontological Resources Inventory included archival research at the Northwest Information Center (NWIC), examination of historical maps, aerial photographs, and the federal land patent records maintained by the Bureau of Land Management, a search of the Native American Heritage Commission (NAHC) Sacred Lands File, and field inspection of the proposed project site. During the field survey, all visible ground surfaces within the project area were carefully examined for cultural materials (e.g., flaked stone tools, tool-making debris, stone milting tools, or-fire affected rock), soil discoloration that might indicate the presence of a cultural midden, soil depressions and features indicative of the former presence of structures or buildings, or historic-era debris.

Historical resources are features that are associated with the lives of historically important persons and/or historically significant events, that embody the distinctive characteristics of a type, period, region or method of construction, or that have yielded, or may be likely to yield, information important to the pre-history or history of the local area, California, or the nation. Examples of typical historical resources include, but are not limited to, buildings, farmsteads, rail lines, bridges, and trash scatters containing objects such as colored glass and ceramics.

Per the Cultural and Paleontological Resources Inventory, two historic-era resources have been previously mapped within the project area: the Shannon/Williamson Ranch and the Contra Costa-Las Positas Transmission Line. The Shannon/Williamson Ranch has contributing features listed under the National Register of Historic Places (NRHP)/California Register of Historical Resources (CRHR). However, the contributing features and artifacts associated with the Shannon/Williamson ranch are not present within the project area. All contributing features from the Shannon/Williamson Ranch are preserved in a fenced, approximately four-acre area at 4900 Lone Tree Way, approximately 1.25 miles north of the project area. The steel lattice towers and other features/artifacts associated with the overhead Contra Costa-Las Positas Transmission Line were found not eligible for NRHP or CRHR listing, are not present with the project area. Therefore, known historic resources do not exist on-site or in the off-site alternative roadway area, and implementation of the proposed project would not adversely affect any such resources.

6 Natural Investigations Company. *Cultural and Paleontological Resources Inventory for the Albers Ranch Project, City of Antioch, Contra Costa County California.* May 25, 2021.

Based on the results of the records search, review of archival maps and photographs, Native American settlement patterns, geoarchaeological study, site specific variables, field survey, and assessment of direct or indirect project impacts, the potential for the discovery of buried archaeological materials within the project area, including the off-site improvements area, is considered to be low. In addition, prehistoric or ethnohistoric resources were not documented within the project site.

However, previously unknown cultural or archaeological resources, including human remains, have the potential to be uncovered during ground-disturbing construction and excavation activities at the project site. If previously unknown resources are encountered during construction activities, the proposed project could cause a substantial adverse change in the significance of a unique archaeological resource pursuant to CEQA Guidelines Section 15064.5 and/or disturb human remains, including those interred outside of dedicated cemeteries, during construction. Therefore, impacts could be considered ***potentially significant***.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

V-1. *In the event that a cultural resource is inadvertently discovered during project activities, work shall be halted within 100 feet (30 meters) of the find and a qualified archaeologist (36 CFR Part 61) notified immediately so that an assessment of potential significance can be undertaken in accordance with City of Antioch General Plan Policy 10.9.2.d (2003). Construction activities may continue in other areas, but shall not resume in the area of the find until the City of Antioch Community Development Department provides written permission.*

If the discovery proves to be significant, additional work, such as data recovery excavation, may be warranted and would be discussed in consultation with the City of Antioch Community Development Department, any invested tribes, and other relevant regulatory agencies, as appropriate.

V-2. *In the event of the accidental discovery or recognition of any or human remains, further excavation or disturbance of the find or any nearby area reasonably suspected to overlie adjacent human remains shall not occur until compliance with the provisions of CEQA Guidelines Section 15064.5(e)(1) and (2) has occurred. The Guidelines specify that in the event of the discovery of human remains other than in a dedicated cemetery, no further excavation at the site or any nearby area suspected to contain human remains shall occur until the County Coroner has been notified to determine if an investigation into the cause of death is required. If the coroner determines that the remains are Native American, then, within 24 hours, the Coroner must notify the Native American Heritage Commission, which in turn will notify the most likely descendants who may recommend treatment of the remains and any grave goods. If the Native American Heritage Commission is unable to identify a most likely descendant or most likely descendant fails to make a recommendation within 48 hours after notification by the Native American Heritage Commission, or the landowner or his authorized agent rejects the* *recommendation by the most likely descendant and mediation by the Native American Heritage Commission fails to provide a measure acceptable to the landowner, then the landowner or his authorized representative shall rebury the human remains and grave goods with appropriate dignity at a location on the property not subject to further disturbances. Should human remains be encountered, a copy of the resulting County Coroner report noting any written consultation with the Native American Heritage Commission shall be submitted as proof of compliance to the City's Community Development Department.*

VI. ENERGY. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	✖	☐
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	✖	☐

Discussion

a,b. The main forms of available energy supply are electricity, natural gas, and oil. A description of the 2019 California Green Building Standards Code and the Building Energy Efficiency Standards, with which the proposed project would be required to comply, as well as discussions regarding the proposed project's potential effects related to energy demand during construction and operations are provided below.

California Green Building Standards Code

The 2019 California Green Building Standards Code, otherwise known as the CALGreen Code (CCR Title 24, Part 11), is a portion of the California CBSC, which became effective with the rest of the California Building Standards Code (CBSC) on January 1, 2020. The purpose of the CAL Green Code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices. The CALGreen standards regulate the method of use, properties, performance, types of materials used in construction, alteration repair, improvement and rehabilitation of a structure or improvement to property. The provisions of the code apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout California. Requirements of the CALGreen Code include, but are not limited to, the following measures:

- Compliance with relevant regulations related to future installation of Electric Vehicle charging infrastructure in residential and non-residential structures;
- Indoor water use consumption is reduced through the establishment of maximum fixture water use rates;
- Outdoor landscaping must comply with the California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), or a local ordinance, whichever is more stringent, to reduce outdoor water use;
- Diversion of 65 percent of construction and demolition waste from landfills; and
- Mandatory use of low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board.

Building Energy Efficiency Standards

The 2019 Building Energy Efficiency Standards is a portion of the CBSC, which expands upon energy efficiency measures from the 2016 Building Energy Efficiency Standards resulting in a seven percent reduction in energy consumption from the 2016 standards for residential structures. Energy reductions relative to previous Building Energy Efficiency Standards would be achieved through various regulations including requirements for the use of high efficacy lighting, improved water heating system efficiency, and high-performance attics and walls.

One of the improvements included within the 2019 Building Energy Efficiency Standards is the requirement that certain residential developments, including some single-family and low-rise residential developments, include on-site solar energy systems capable of producing 100 percent of the electricity demanded by the residences. Certain residential developments, including developments that are subject to substantial shading, rendering the use of on-site solar photovoltaic systems infeasible, are exempted from the foregoing requirement; however, such developments are subject to all other applicable portions of the 2019 Building Energy Efficiency Standards. Once rooftop solar electricity generation is factored in, homes built under the 2019 standards will use approximately 53 percent less energy than those under the 2016 standards.

Construction Energy Use

Construction of the proposed project would involve on-site energy demand and consumption related to use of oil in the form of gasoline and diesel fuel for construction worker vehicle trips, hauling and materials delivery truck trips, and operation of off-road construction equipment. In addition, diesel-fueled portable generators may be necessary to provide additional electricity demands for temporary on-site lighting, welding, and for supplying energy to areas of the sites where energy supply cannot be met via a hookup to the existing electricity grid. Project construction would not involve the use of natural gas appliances or equipment.

Even during the most intense period of construction, due to the different types of construction activities (e.g., site preparation, grading, building construction), only portions of the project site would be disturbed at a time, with operation of construction equipment occurring at different locations on the project site, rather than a single location. In addition, all construction equipment and operation thereof would be regulated per the California Air Resources Board (CARB) In-Use Off-Road Diesel Vehicle Regulation, which is intended to reduce emissions from in-use, off-road, heavy-duty diesel vehicles in California by imposing limits on idling, requiring all vehicles to be reported to CARB, restricting the addition of older vehicles into fleets, and requiring fleets to reduce emissions by retiring, replacing, or repowering older engines, or installing exhaust retrofits. The In-Use Off-Road Diesel Vehicle Regulation would subsequently help to improve fuel efficiency and reduce GHG emissions. Technological innovations and more stringent standards are being researched, such as multi-function equipment, hybrid equipment, or other design changes, which could help to reduce demand on oil and emissions associated with construction.

The CARB has prepared the *2017 Climate Change Scoping Plan Update* (2017 Scoping Plan),[7] which builds upon previous efforts to reduce greenhouse gas (GHG) emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. Appendix B of the 2017 Scoping Plan includes examples of local actions (municipal code changes, zoning changes, policy directions, and mitigation measures) that would support the State's climate goals. The examples provided include, but are not limited to, enforcing idling time restrictions for construction vehicles, utilizing existing grid power for electric energy rather than operating temporary gasoline/diesel-powered generators, and increasing use of electric and renewable fuel-powered construction equipment. The In-Use Off-Road Diesel Vehicle Regulation described above, with which the proposed project must comply, would be consistent with the intention of the 2017 Scoping Plan and the recommended actions included in Appendix B of the 2017 Scoping Plan.

7 California Air Resources Board. *The 2017 Climate Change Scoping Plan Update.* November 2017.

Based on the above, the temporary increase in energy use occurring during construction of the proposed project would not result in a significant increase in peak or base demands or require additional capacity from local or regional energy supplies. In addition, the proposed project would be required to comply with all applicable regulations related to energy conservation and fuel efficiency, which would help to reduce the temporary increase in demand.

Operational Energy Use

Following implementation of the proposed project, PG&E would provide electricity and natural gas to the project site. Energy use associated with operation of the proposed project would be typical of residential uses, requiring electricity and natural gas for interior and exterior building lighting, heating, ventilation, and air conditioning (HVAC), electronic equipment, machinery, refrigeration, appliances, security systems, and more. Maintenance activities during operations, such as landscape maintenance, would involve the use of electric or gas-powered equipment. In addition to on-site energy use, the proposed project would result in transportation energy use associated with vehicle trips generated by the proposed residential development.

The proposed project would be subject to all relevant provisions of the CBSC, including the Building Energy Efficiency Standards and CALGreen Code. Adherence to the CALGreen Code and the Building Energy Efficiency Standards would ensure that the proposed structures would consume energy efficiently. For example, consistent with the 2019 Building Energy Efficiency Standards requirement that residential developments include on-site solar energy systems, the proposed buildings would be equipped with rooftop solar panels, which would provide on-site renewable energy to meet the project’s electricity demand. Thus, required compliance with the CBSC would ensure that the building energy use associated with the proposed project would not be wasteful, inefficient, or unnecessary.

With regard to transportation energy use, the proposed project would comply with all applicable regulations associated with vehicle efficiency and fuel economy, such as the Corporate Average Fuel Economy (CAFE) Standards and Pavley. Issues related to vehicle miles travelled (VMT) and access to public transit, bicycle, and pedestrian facilities will be addressed in the Transportation chapter of the Albers Ranch EIR being prepared for the project.

Conclusion

Based on the above, construction and operation of the proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources or conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Thus, a ***less-than-significant*** impact would occur.

VII. GEOLOGY AND SOILS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	✖	☐
ii. Strong seismic ground shaking?	☐	☐	✖	☐
iii. Seismic-related ground failure, including liquefaction?	☐	✖	☐	☐
iv. Landslides?	☐	✖	☐	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	✖	☐	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	✖	☐	☐
d. Be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	✖	☐	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	✖
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	✖	☐	☐

Discussion

The following discussion is based on a Preliminary Geotechnical Exploration for the project site prepared by ENGEO Incorporated (ENGEO) (see Appendix B).[8]

ai-ii. According to the Preliminary Geotechnical Exploration, the project site and off-site improvement area is not located within an Alquist-Priolo Earthquake Fault Zone. However, seismicity at the proposed project site is influenced by the Great Valley fault. The Great Valley fault is considered capable of causing the highest ground shaking at the site. In addition, the nearest strike-slip fault zoned active by the State of California Geological Survey is the Greenville Fault, located approximately 5.6 miles to the southwest. Because known active faults do not extend through the project site, the potential for surface rupture due to faulting occurring beneath the site during the design life of the proposed development would be low.

Due to the site's proximity to active faults, the potential exists for the proposed single-family residential subdivision to be subject to seismic ground shaking. However, the proposed buildings would be properly engineered in accordance with the CBSC, which includes engineering standards appropriate for the seismic area in which the project site is located. Structures built consistent with the CBSC should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage, and (3) resist major earthquakes without collapse

8 ENGEO Incorporated. *Preliminary Geotechnical Exploration Sullenger Ranch, Antioch, CA.* June 29, 2005.

but with some structural as well as nonstructural damage. Conformance with the design standards is enforced through building plan review and approval by the City of Antioch Building Division prior to the issuance of building permits. Proper engineering of the proposed project would ensure that seismic-related effects would not cause adverse impacts. Therefore, a ***less-than-significant*** impact would occur related to seismic surface rupture and strong seismic ground shaking.

aiii,aiv,
c,d. The proposed project's potential effects related to liquefaction, landslides, lateral spreading, subsidence/settlement, and expansive soils are discussed in detail below.

Liquefaction

Soil liquefaction results from loss of strength during cyclic loading, such as imposed by earthquakes. Soils most susceptible to liquefaction are clean, loose, saturated, uniformly graded fine sands below the groundwater table. Empirical evidence indicates that loose silty sands are also potentially liquefiable. When seismic ground shaking occurs, the soil is subjected to cyclic shear stresses that can cause excess hydrostatic pressures to develop. If excess hydrostatic pressures exceed the effective confining stress from the overlying soil, the sand may undergo deformation. If the sand undergoes virtually unlimited deformation without developing significant resistance, the sand is said to have liquefied, and if the sand consolidates or vents to the surface during and following liquefaction, ground settlement and surface deformation may occur.

The soil borings conducted as part of the Preliminary Geotechnical Exploration consisted primarily of silty clays, claystone, and sandstone. Groundwater was encountered at depths of 13 feet below surface. Based on the field exploratory data and estimated density and soil gradation, ENGEO determined that the potential for liquefaction to occur at the site is low.

Landslides

Seismically-induced landslides are triggered by earthquake ground shaking. The risk of landslide hazard is greatest in areas with steep, unstable slopes. Landslides are a primarily geotechnical consideration for most of the East Bay Hills.

Landslide deposits identified by ENGEO were mapped using stereo-paired aerial photographs, and field checked during site reconnaissance and field explorations. During the field reconnaissance, ENGEO encountered profiles of stiff to very stiff silty clays overlying sandstone and claystone bedrock in the test pits excavated in possible landslide areas. With the exception of isolated areas along Sand Creek, ENGEO did not identify hummocky, uneven terrain characteristic of landslide deposits across the majority of the site. ENGEO concludes that the features initially suspected of landslides are more likely colluvial material. Therefore, the potential for landslides to occur at the site is low.

Lateral Spreading

Lateral spreading is a failure within a nearly horizontal soil zone (possibly due to liquefaction) which causes the overlying soil mass to move toward a free face or down a gentle slope. As described above, the liquefaction potential for subsurface soils is considered to be low. Therefore, ENGEO determined that the potential for lateral spreading to occur at the site during seismic shaking is also considered low due to the lack of potentially liquefiable soils.

Subsidence/Settlement

Subsidence is the settlement of soils of very low density generally from either oxidation of organic material, or desiccation and shrinkage, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. As discussed above, on-site soils are generally not considered to be subject to substantial liquefaction risks. In addition, loose granular soils located were not identified deeper than two feet below the ground surface, and the upper two feet of the site would be re-worked as engineered fill. Because the site presents low potential for liquefaction, the potential for seismically induced settlement to occur at the project site is also considered to be low.

Expansive Soils

Expansive soils shrink and swell as a result of moisture changes, which can cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. Building damage due to moisture changes in expansive soils can be reduced by appropriate grading practices and using post-tensioned slab foundations or similarly stiffened foundation systems, which are designed to resist the deflections associated with soil expansion.

Based on the results of on-site soil boring investigations conducted as part of the Preliminary Geotechnical Exploration, the soils encountered across the site consisted of plastic silty clay deposits. Plastic silty clay deposits can be expected to display a high expansion potential. Compliance with the design recommendations included in the Preliminary Geotechnical Exploration would be necessary to ensure that hazards related to expansive soils do not occur.

Off-site Improvement Area

Should the Creekside/Vineyards at Sand Creek Project not be developed, an alternative access roadway may be constructed as part of the proposed project. The alternative roadway would connect the northern portion of the site to the future Sand Creek Road, following the eastern boundary of the CCCFCD property and Basin and crossing Sand Creek. The optional roadway was included as part of the Aviano Project and has been analyzed within the associated EIR. Accordingly, should the alternative access roadway be constructed as part of the proposed project, the project applicant would be required to comply with all applicable mitigation measures related to the roadway set forth in the EIR prepared for the Aviano Project.

Conclusion

Based on the above discussion, without incorporation of site-specific design considerations, the proposed project could be subject to risks related to being located on highly expansive soils. Thus, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

VII-1. *All grading and foundation plans for the development shall be designed by a Civil and Structural Engineer and reviewed and approved by the City of Antioch Building Division prior to issuance of grading and building permits to ensure that all geotechnical recommendations specified in the*

Preliminary Geotechnical Exploration prepared for the proposed project are properly incorporated and utilized in the project design.

VII-2. *Prior to issuance of any grading permits, the project applicant shall submit to the City of Antioch Engineering Department, for review and approval, a design-level geotechnical exploration study produced by a California Registered Civil Engineer or Geotechnical Engineer and identify grading and building practices necessary to achieve compliance with the latest adopted edition of the California Building Standards Code's geologic, soils, and seismic requirements. Consistent with the Preliminary Geotechnical Exploration prepared for the proposed project, the design-level geotechnical exploration study shall include additional soil borings, test pits, laboratory testing, chemical testing for corrosivity, geologic mapping and fault trenching/evaluation.*

b. During grading activities associated with development of the proposed project, and prior to overlaying of the ground with impervious surfaces and landscaping elements, topsoil would temporarily be exposed. Thus, the potential exists for wind and water to erode portions of the exposed topsoil during construction, which could adversely affect downstream storm drainage facilities. Impacts related to substantial soil erosion or the loss of topsoil during construction of the proposed project would be ***potentially significant.***

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

VII-3. *Prior to issuance of grading and building permits, the project applicant shall submit, for the review and approval by the City Engineer, an erosion control plan that utilizes standard construction practices to limit the erosion effects during construction of the proposed project. Measures shall include, but are not limited to, the following:*

- *Hydro-seeding;*
- *Placement of erosion control measures within drainage ways and ahead of drop inlets;*
- *The temporary lining (during construction activities) of drop inlets with "filter fabric" (a specific type of geotextile fabric);*
- *The placement of straw wattles along slope contours;*
- *Directing subcontractors to a single designation "wash-out" location (as opposed to allowing them to wash-out in any location they desire);*
- *The use of siltation fences; and*
- *The use of sediment basins and dust palliatives.*

e. The proposed project would connect to a sewer line within the Creekside/Vineyards at Sand Creek Project planned for construction to the east of the project site. The construction or operation of septic tanks or other alternative wastewater disposal systems is not included as part of the proposed project. Therefore, ***no impact*** regarding the capability of soil to adequately support the use of septic tanks or alternative wastewater disposal systems would occur.

f. Per the City of Antioch General Plan, numerous fossils have been collected from the Antioch Planning Area. A fossil locality search at the California Academy of Sciences, Golden Gate Park identified marine pelecypod and gastropod fossils collected from almost all of the sedimentary formations located in the City. Literature review indicated that all of the formations north of Mt. Diablo contain fossils. At least eight fossil localities occur within, or immediately adjacent to, the City's Planning Area, and another five are located within a one-mile radius of the Planning Area. Fossils in the Planning Area identified by the California Museum of Paleontology, UC Berkeley include mammoths, primitive horses, bison, rats, beaver-type creatures, and sloths.

According to the Cultural and Paleontological Resources Inventory prepared for the proposed project, the valley between the two hills and the western extent of the project area is underlain by surficial Holocene-age alluvium.[9] Holocene-age deposits are typically considered to have a low paleontological potential because the deposits are geologically immature and are unlikely to have fossilized the remains of organisms, particularly deposits less than 6,000 years old. In contrast, deposits of older Pleistocene alluvium mapped in the greater Antioch vicinity have produced a number of vertebrate fossils. While fossil localities are not known to directly underlie the project area, the sediments in the greater project vicinity have yielded vertebrate remains that are considered important paleontological resources for CEQA purposes. As a result, the potential exists that ground-disturbing activities associated with the proposed project could inadvertently destroy, directly or indirectly, unique paleontological resources or sites.

The project site and off-site improvements area do not contain any unique geologic features. However, based on the above, paleontological resources could exist within the project area. Should previously unknown paleontological resources exist within the project area, ground-disturbing activity, such as grading, trenching or excavating, associated with implementation of the proposed project would have the potential to disturb or destroy such features. Therefore, the proposed project could result in the direct or indirect destruction of a unique paleontological resource, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

VII-4. *Prior to the initiation of ground-disturbing activities, a qualified paleontologist shall be retained to administer Worker Environmental Awareness Program (WEAP) training to construction personnel so that a basic understanding of local geology and the paleontological sensitivity of the project area will be acquired by those involved in earth-moving activities. The training shall include information on the types of fossils that may be encountered during project work, relevant compliance requirements, and the course to action to be taken in the event of an inadvertent fossil discovery. A sign-in sheet shall be kept with the*

9 Natural Investigations Company. *Cultural and Paleontological Resources Inventory for the Albers Ranch Project, City of Antioch, Contra Costa County California.* May 25, 2021.

signatures of all attendees for submission to the City of Antioch Community Development Department.

VII-5. *In the event that a paleontological resource is inadvertently discovered during project-related work, regardless of the depth of excavation or location, work shall be halted within 50 feet (15 meters) of the find and a qualified paleontologist (Society of Vertebrate Paleontology [SVP] 2010) notified immediately so that an assessment of the resource's potential significance can be undertaken in accordance with City of Antioch General Plan Policy 10.9.2.d (City 2003). Construction activities could continue in other areas.*

If the find is determined to be significant under SVP criteria, the find shall be left in place without further disturbance, or if avoidance is not feasible, then additional work, such as fossil recovery excavation (salvage) and curation at a certified repository, such as the University of California Museum of Paleontology (UCMP), may be warranted and would be discussed in consultation with the City of Antioch Community Development Department, and any other relevant regulatory agency, as appropriate.

VIII. GREENHOUSE GAS EMISSIONS. *Would the project:*	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	✖	☐	☐	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?	✖	☐	☐	☐

Discussion

a,b. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on earth. An individual project's GHG emissions are at a micro-scale level relative to global emissions and effects to global climate change; however, an individual project could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. As such, impacts related to emissions of GHG are inherently considered cumulative impacts.

Estimated GHG emissions attributable to future development would be primarily associated with increases of carbon dioxide (CO_2) and, to a lesser extent, other GHG pollutants, such as methane (CH_4) and nitrous oxide (N_2O) associated with area sources, mobile sources or vehicles, utilities (electricity and natural gas), water usage, wastewater generation, and the generation of solid waste. The primary source of GHG emissions for the project would be expected to be mobile source emissions. The common unit of measurement for GHG is expressed in terms of annual metric tons of CO_2 equivalents ($MTCO_2e$/yr).

Buildout of the proposed project would contribute to increases of GHG emissions that are associated with global climate change during construction and operations of the proposed project. As such, the proposed project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Therefore, impacts related to GHG emissions and global climate change could be cumulatively considerable and considered ***potentially significant***.

Further analysis of this impact will be discussed in the Air Quality and Greenhouse Gas Emissions chapter of the Albers Ranch EIR being prepared for the project

IX. HAZARDS AND HAZARDOUS MATERIALS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	✖	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?	☐	✖	☐	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	✖
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	✖
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	✖
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	✖	☐
g. Expose people or structures, either directly or indirectly, to the risk of loss, injury or death involving wildland fires?	☐	☐	✖	☐

Discussion

a. Residential land uses, including uses associated with the future assisted living facility, and commercial land uses, are not typically associated with the routine transport, use, disposal, or generation of substantial amounts of hazardous materials. Future residents may use common household cleaning products, fertilizers, and herbicides on-site, any of which could contain potentially hazardous chemicals; however, such products would be expected to be used in accordance with label instructions. Due to the regulations governing use of such products and the amount utilized on the site, routine use of such products would not represent a substantial risk to public health or the environment. Therefore, the project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and a ***less-than-significant*** impact would occur.

b. The following discussion provides an analysis of potential hazards and hazardous materials associated with upset or accident conditions related to the proposed construction activities and existing on-site conditions.

Construction Activities

Construction activities associated with the proposed project would involve the use of heavy equipment, which would contain fuels and oils, and various other products such as concrete, paints, and adhesives. Small quantities of potentially toxic substances (e.g., petroleum and other chemicals used to operate and maintain construction equipment) would be used at the project site and transported to and from the site during construction. However, the project contractor would be required to comply with all California Health and

Safety Codes and local City ordinances regulating the handling, storage, and transportation of hazardous and toxic materials. Compliance with such regulations would ensure that a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions during construction would not occur.

Existing On-Site Hazardous Materials

A Phase I Environmental Site Assessment (ESA) was prepared for the project site by ENGEO for the purpose of identifying potential recognized environmental conditions (RECs) associated with the project site (see Appendix C).[10] The Phase I ESA included a survey of the site and a review of historical documentation, aerial photography, regulatory agency files, and environmental site radius reports.

Currently, the project site consists of undeveloped and hilly land used as dry farmland, with a reach of Sand Creek within the western portion of the project site. Historical sources reviewed as part of the Phase I ESA indicate that the site was an undeveloped hilly area from at least 1912 to 1980. The site has been historically used as cattle-grazing land.

Per the Phase I ESA, features such as stressed vegetation, septic systems, water wells, above-ground storage tanks (ASTs), and underground storage tanks (USTs) were not identified on the site. In addition, the project site does not contain existing structures, thereby eliminating any risks related to exposure to asbestos or lead-based paints. Based on a review of environmental record sources regarding the project site and nearby properties, the project site is not located within the vicinity of any pre-existing off-site hazards that could pose risk to the proposed development.

Two petroleum pipelines owned by Conoco Phillips and Chevron run through the southwest corner of the project site and are visible as they cross Sand Creek. Although visible signs of leakage were not identified associated with the pipelines, ENGEO considers the pipelines to be a potential REC due to the potential for impairing surrounding soils.

Conclusion

Because construction activities would be required to adhere to all relevant guidelines and ordinances regulating the handling, storage, and transportation of hazardous materials, significant hazards would not occur during construction. In addition, based on the results of the Phase I ESA, existing hazardous materials, including contaminated soils, are not anticipated to occur on the project site. Nonetheless, the potential exists for ground-disturbing activities associated with proposed project to encounter the two petroleum pipelines located in the southwest corner of the site. Therefore, implementation of the proposed project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accidental conditions involving the release of hazardous materials into the environment, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

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[10] ENGEO Incorporated. *Phase One Environmental Site Assessment Sullenger Ranch Antioch, California.* June 29, 2005.

IX-1. Prior to final map approval, the project applicant shall submit to the City of Antioch Engineering Department, for review and approval, plans which show that future inhabited structures will not be located over or within the required setback from any active petroleum pipelines in compliance with the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) Construction Site Review Program.

IX-2. Prior to issuance of any grading permits, the project applicant shall coordinate with Conoco Phillips and Chevron to determine the accurate depths and alignment of the existing on-site pipelines and shall conduct field checking and potholing of the pipelines, if necessary. Arrangements for potholing of the pipelines shall be made at least 48 hours in advance. The project applicant shall be responsible for providing a backhoe and operator, as well as a surveyor if needed. All construction plans that involve pipeline easement encroachments shall be submitted to the applicable pipeline owner to allow for review.

After determining the accurate depths and alignments of the existing pipelines, the results shall be noted on all project construction plans, subject to review by the City Engineer. For any work occurring within the pipeline easement, construction plans shall demonstrate compliance with applicable local, State, and federal regulations and development restrictions, which would include, but would not be limited to, the following:

- *Maintain a minimum of 12 inches of clearance between the pipelines and other cross-lines that intersect at a 90-degree angle, or a minimum of 24 inches of clearance for intersection angles less than 90-degrees;*
- *Maintain a minimum of 24 inches of undisturbed clearance between the top of pipe and bottom of the sub grade for paving and grass or shallow rooted plants within the pipeline easements;*
- *Prohibit deep-rooted trees and structures within pipeline easements;*
- *All excavations within 24-inches of the pipelines shall be accomplished using hand tools only;*
- *Restrict use of heavy vibratory equipment over pipelines; and*
- *Notify Underground Service Alert (USA) at 800-227-2600 at least 48 hours prior to any excavation work.*

c. The project site is not located within a quarter mile of any existing or proposed schools. The nearest school is Dozier-Libbey Medical High School, located approximately 0.44-mile north of the site. While the Antioch Unified School District owns the parcel located immediately to the northwest of the site (APN 057-042-005), the City has not received an application for development of the property. Furthermore, as discussed above, implementation of Mitigation Measures IX-1 and IX-2 would ensure that hazardous materials would not be emitted during construction or operation of the proposed project. Therefore, the proposed project would have ***no impact*** related to hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

d. According to the Department of Toxic Substances Control EnviroStor database, the project site or off-site improvement area is not located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.[11] In addition, as part of the Phase I ESA prepared for the project site, Environmental Data Resources Inc. conducted a search of local, State, and federal agency databases regarding the project site and known contaminated sites in the immediate vicinity. According to the search, the project site is not located in the vicinity of any known contaminated sites. Therefore, the project would not create a significant hazard to the public or the environment associated with such, and ***no impact*** would occur.

e. The nearest airport to the site is the Byron Airport, which is located approximately 10 miles southeast of the site. As such, the project site is not located within two miles of any public airports or private airstrips, and does not fall within an airport land use plan area. Therefore, ***no impact*** related to a safety hazard for people residing or working in the project area related to such would occur.

f. In 1996, the City of Antioch approved an Emergency Plan that addresses response to disasters, including, but not limited to, earthquakes, floods, fires, hazardous spills or leaks, major industrial accidents, major transportation accidents, major storms, airplane crashes, environmental response, civil unrest, and national security emergencies. The plan outlines the general authority, organization, and response actions for City of Antioch staff when disasters happen. Implementation of the proposed project would not modify the existing roadways in the area, but would provide additional connections to the existing roadway system, which would allow for additional route options during an emergency. Thus, the proposed project would not physically interfere with the Emergency Plan, particularly with identified emergency routes. Furthermore, the proposed project would not include land uses or operations that could impair implementation of the plan. Therefore, the proposed project would not interfere with an emergency evacuation or response plan, and a ***less-than-significant*** impact would occur.

g. Issues related to wildfire hazards are discussed in further detail in Section XX, Wildfire, of this Initial Study. According to the California Department of Forestry and Fire Protection (CAL FIRE) Fire and Resource Assessment Program, the project site and off-site improvements area are located within a Local Responsibility Area and is included in a Moderate Fire Hazard Severity Zone; thus, the site is not located within a Very High Fire Hazard Severity Zone.[12] The area to the south of the project site, which is located outside of the City limits within a State Responsibility Area, is similarly classified as a Moderate Fire Hazard Severity Zone. Upon completion of the Creekside/Vineyards at Sand Creek to the east of the project site, as well as future development of residential uses to the north and northeast of the project site, wildfire risk at the project site would be further reduced.

The open space areas proposed within the northern, western, and southern portions of the project site would be subject to all applicable defensible space requirements set forth in PRC Section 4291. PRC Section 4291 establishes guidelines to reduce vegetation growth, and thereby minimize the fuel load within the vicinity of structures. In the case of the proposed project, maintenance of the defensible space on each lot would be the responsibility of the individual property owner.

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11 Department of Toxic Substances Control. *EnviroStor.* Available at: https://dtsc.ca.gov/your-envirostor/. Accessed June 2021.

12 California Department of Forestry and Fire Protection. *Contra Costa County, Very High Fire Hazard Severity Zones in LRA*. January 7, 2009.

Based on the above, the proposed project would not expose people or structures, either directly or indirectly, to the risk of loss, injury or death involving wildland fires, and a ***less-than-significant*** impact would occur.

X. HYDROLOGY AND WATER QUALITY. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	✖	☐	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	✖	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i. Result in substantial erosion or siltation on- or off-site;	☐	☐	✖	☐
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	✖	☐
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	✖	☐
iv. Impede or redirect flood flows?	☐	✖	☐	☐
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	✖
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	✖	☐

Discussion

a. The following discussion provides a summary of the proposed project's potential to violate water quality standards/waste discharge requirements or otherwise degrade water quality within Sand Creek during construction and operation.

Construction

During the early stages of construction activities, topsoil would be exposed due to grading and excavation of the site. After grading and prior to overlaying the ground surface with impervious surfaces and structures, the potential exists for wind and water erosion to discharge sediment and/or urban pollutants into stormwater runoff, which could adversely affect water quality within Sand Creek and other downstream waterways.

The State Water Resources Control Board (SWRCB) regulates stormwater discharges associated with construction activities where clearing, grading, or excavation results in a land disturbance of one or more acres. The City's National Pollutant Discharge Elimination System (NPDES) permit requires applicants to show proof of coverage under the State's General Construction Permit prior to receipt of any construction permits. The State's General Construction Permit requires a SWPPP to be prepared for the site. A SWPPP describes BMPs to control or minimize pollutants from entering stormwater and must address both grading/erosion impacts and non-point source pollution impacts of the development project. Because the proposed project would disturb greater than one acre of land, the proposed project would be subject to the requirements of the State's General Construction Permit.

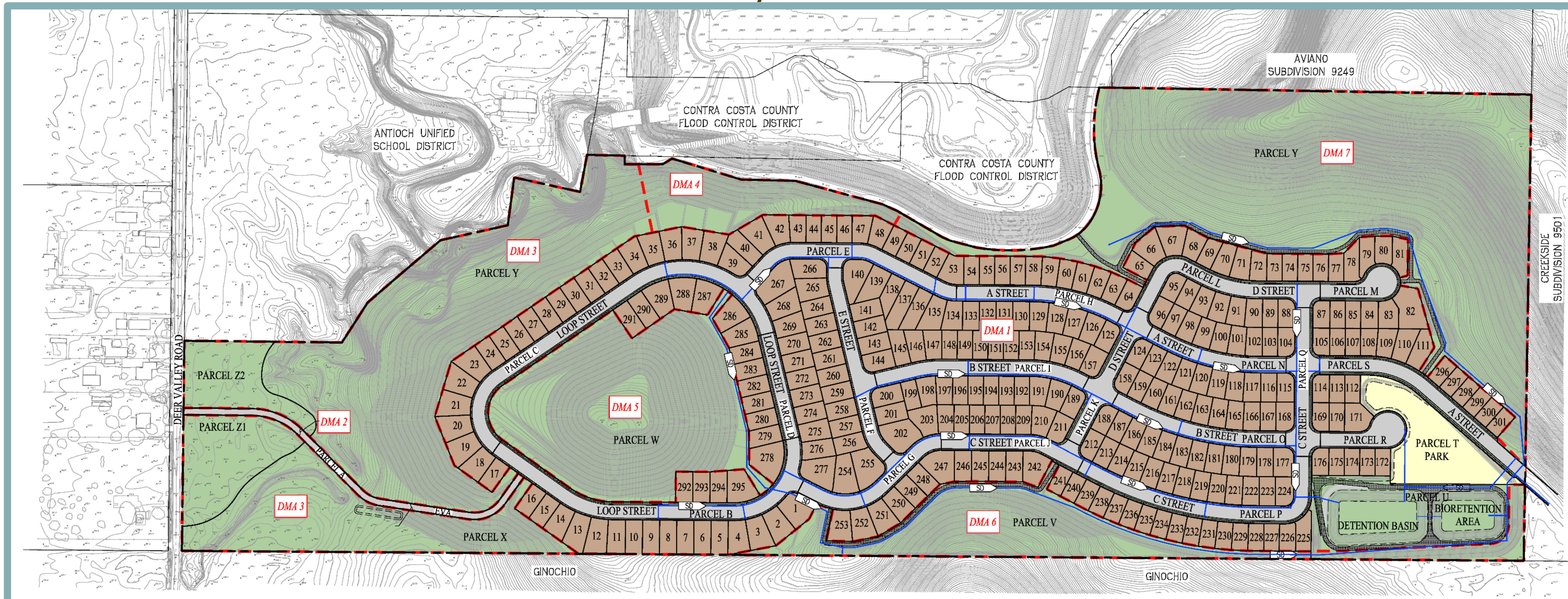
Operation

The proposed uses would not involve operations typically associated with the generation or discharge of polluted water. Thus, typical operations on the project site would not violate any water quality standards or waste discharge requirements, nor degrade water quality. However, addition of the impervious surfaces on the site would result in the generation of urban runoff, which could contain pollutants if the runoff comes into contact with vehicle fluids on parking surfaces and/or landscape fertilizers and herbicides. All municipalities within Contra Costa County (and the County itself) are required to develop more restrictive surface water control standards for new development projects as part of the renewal of the Countywide NPDES permit.

The City of Antioch has adopted the County C.3 Stormwater Standards, which require new development and redevelopment projects that create or alter 10,000 or more sf of impervious area to contain and treat all stormwater runoff from the project site. Thus, the proposed project would be subject to the requirements of the SWRCB and the RWQCB, including the C.3 Standards, which are included in the City's NPDES General Permit. Compliance with such requirements would ensure that impacts to water quality standards or waste discharge requirements would not occur during operation of the proposed project.

A Preliminary Stormwater Control Plan (SWCP) has been prepared for the proposed project (see Appendix D). The SWCP prepared for the proposed project conforms with the most recent Contra Costa Clean Water Program Stormwater C.3 Guidebook and verifies that the proposed project would comply with all City stormwater requirements. In compliance with the C.3 Guidebook, the proposed project would divide the site into seven distinct drainage management areas (DMAs) (see Figure 12). Stormwater runoff within the DMAs would be captured by a series of new inlets and flow, by way of new underground storm drain piping, to a detention basin and bio-retention basin located within the southeastern portion of the project site. The bio-retention basin would remove pollutants primarily by filtering runoff slowly through an active layer of soil. Treated runoff would be captured by a perforated underdrain, which would route flows to future storm drain infrastructure to be constructed as part of the approved Creekside/Vineyards at Sand Creek Project subdivision to the east of the project site. The bio-retention basin would include an overflow inlet that would route excess runoff entering the basin directly to the future Creekside/Vineyards at Sand Creek Project storm drain system during large storm events. The bio-retention basin would be sized to meet or exceed the minimum volume requirements necessary to adequately handle all runoff from the proposed project impervious surfaces and landscaping. Runoff from the EVA road in the southwestern portion of the project site would be collected into a proposed bio-swale within Parcel X and eventually discharge through a new outfall into the tributary to Sand Creek. Detention of the stormwater runoff from the EVA would not be necessary as Sand Creek drains into the Basin. Similar to the bio-retention basin, the bio-swale would filter pollutants before discharge and would be sized to meet or exceed the minimum volume requirements necessary to adequately handle all runoff from the proposed EVA area.

Figure 12
Preliminary Stormwater Control Plan



LEGEND

PROPOSED — DESCRIPTION

- SUBDIVISION BOUNDARY
- LOT LINE
- RIGHT OF WAY
- CURB & SIDEWALK
- BIORETENTION AREA
- SD — STORM DRAIN
- DMA BOUNDARY
- FIELD INLET
- MANHOLE
- IMPERVIOUS AREA
- PERVIOUS AREA
- LOTS
- OPTIONAL PARK/FUTURE DEVELOPMENT AREA
- DMA 1 — DRAINAGE MANAGEMENT AREA

PERVIOUS/IMPERVIOUS AREAS										
AREA ID	PER (SF)	PER (%)	IMP (SF)	IMP (%)	TOTAL (SF)	DETENTION REQUIRED (CY)	DETENTION PROVIDED (CY)	BIORETENTION REQUIRED (SF)	BIORETENTION PROVIDED (SF)	PONDING (IN)
DMA 1	712,500	33.7%	1,398,700	66.3%	2,111,200	231,335	235,000	13,860	13,900	12
DMA 2	0	0.0%	23,900	100.0%	23,900	---	---	1,760	1,800	12
TOTAL	**712,500**	33.4%	**1,422,600**	66.6%	**2,135,100**	**231,335**	**235,000**	**15,620**	**15,700**	---

SELF TREATING DMA SUMMARY	
AREA ID	AREA (AC)
DMA 3	16.9
DMA 4	2.0
DMA 5	7.1
DMA 6	4.6
DMA 7	15.8
TOTAL	**47.4**

APPENDIX E

POST-PROJECT CONDITIONS

ALBERS PROPERTY

CITY OF ANTIOCH   CONTRA COSTA COUNTY   CALIFORNIA

0' 150' 450' 600'

SCALE: 1" = 150'   DATE: MAY 22, 2019

cbg

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Based on the above, the proposed project would comply with the requirements of the SWRCB and the RWQCB, and would meet or exceed C.3 Standards. Therefore, during operation, the project would comply with all relevant water quality standards and waste discharge requirements, and would not degrade water quality.

Conclusion

Based on the SWCP prepared for the proposed project, the project would comply with all applicable regulations during operation, does not involve uses associated with the generation or discharge of polluted water, and would be designed to adequately treat stormwater runoff from the site prior to discharge. However, disturbance of the on-site soils during construction activities could result in a ***potentially significant*** with regard to violation of water quality standards and degradation of water quality should adequate BMPs not be incorporated during construction in accordance with SWRCB regulations.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

X-1. *Prior to issuance of grading permits, the contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP). The developer shall file the Notice of Intent (NOI) and associated fee to the SWRCB. The SWPPP shall serve as the framework for identification, assignment, and implementation of BMPs. The contractor shall implement BMPs to reduce pollutants in stormwater discharges to the maximum extent practicable. The SWPPP shall be submitted to the Director of Public Works/City Engineer for review and approval and shall remain on the project site during all phases of construction. Following implementation of the SWPPP, the contractor shall subsequently demonstrate the SWPPP's effectiveness and provide for necessary and appropriate revisions, modifications, and improvements to reduce pollutants in stormwater discharges to the maximum extent practicable.*

b,e. The City of Antioch currently does not rely on groundwater for water supplies.[13] Therefore, any water demand associated with the proposed project would not result in a depletion of groundwater in the project area. It should be noted that the project would develop portions of the site and the off-site improvement area with impervious surfaces, which could impede groundwater recharge. However, approximately 50 percent of the site would be retained as open space, which would allow for the natural percolation of stormwater in those areas, particularly the open space areas associated with Sand Creek and the creek's tributary, which would continue to contribute to groundwater recharge similar to existing conditions. The proposed detention basin, bio-retention basin, and bio-swale, as well as the open space area associated with Sand Creek and the creek's tributary, would allow for captured stormwater to infiltrate underlying soils in a manner similar to what currently occurs on-site. Therefore, the proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin, and would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Thus, a ***less-than-significant*** impact would occur.

[13] City of Antioch. *2015 Urban Water Management Plan* [pg. 6-12]. May 2016.

ci-iii. Development of the proposed project would result in an increase in impervious surfaces on the project site, which would alter the existing drainage pattern of the site. However, as discussed above, the project is required to comply with C.3 Standards and is proposed to include appropriate site design measures, source controls, and hydraulically-sized stormwater treatment measures. In addition, projects creating or replacing an acre or more of impervious area must also provide flow control such that post-project runoff does not exceed estimated pre-project rates and durations.[14]

As discussed above, runoff from the impervious areas of the site would be collected and conveyed to the proposed detention and bio-retention basin, and runoff from the EVA specifically would be collected and conveyed to a bio-swale. Per the SWCP prepared for the project, the detention and bioretention facilities would be designed to exceed the minimum volume needed to treat and control runoff from all proposed impervious surfaces and sufficient to ensure that the post-project flows from the project site would not exceed pre-project flows.

In order to ensure that the proposed project's stormwater treatment facilities remain adequate, long-term maintenance would be required. Routine maintenance of the facilities is necessary to ensure that infiltration of water is unobstructed, erosion is prevented, and soils are held together by biologically active plant roots. As noted in the SWCP, proper operation and maintenance of the stormwater management facilities would be the sole responsibility of the future homeowner's association (HOA). The project applicant would be required to prepare and submit, for the City's review, an acceptable Operations and Maintenance Plan in conjunction with project improvement plans. With implementation of the required maintenance activities, the proposed stormwater facilities would continue to properly manage runoff long after completion of construction activities.

Should the Creekside/Vineyards at Sand Creek Project not be developed, an alternative access roadway may be constructed as part of the proposed project. The alternative roadway would connect the northern portion of the site to the future Sand Creek Road, following the eastern boundary of the CCCFCD property and Basin and crossing Sand Creek. The optional roadway was included as part of the Aviano Project and has been analyzed within the associated EIR. Accordingly, should the alternative access roadway be constructed as part of the proposed project, the project applicant would be required to comply with all applicable mitigation measures related to the roadway set forth in the EIR prepared for the Aviano Project.

In conclusion, the proposed project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in erosion, siltation, or flooding on- or off-site, create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff. Consequently, the proposed project would result in a ***less-than-significant*** impact.

civ. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) number 06013C0335F, the northern and western portion of the project site along the alignment of Sand Creek and the creek's tributary is classified as Zone A, which

[14] Contra Costa Clean Water Program. *Stormwater C.3. Guidebook, Stormwater Quality Requirements for Development Applications* [pg. 9]. May 17, 2017.

is a Special Flood Hazard Area located within the 100-year floodplain. As part of the proposed project, development within the mapped 100-year floodplain would be limited to a portion of the proposed EVA road connecting to Deer Valley Road and a portion of the potential alternate access road to the north, should that option be implemented. The remainder of the site, within which the proposed residential buildings and future development would be located, is classified as Zone X, defined by FEMA as an area not within a 100-year or 500-year floodplain.

The proposed EVA road would follow the alignment of an existing unimproved private access road that currently crosses the tributary to Sand Creek in the western portion of the site. A culvert currently exists under the unimproved private road. Substantial grading is not proposed or anticipated to be required for placement of the EVA. The EVA road would be used by emergency vehicles only during an emergency situation, and would not be available for use by the general public. According to FEMA FIRM number 06013C0335F, Zone A in the project vicinity does not have a listed base flood elevation (BFE). A minimum of one foot clearance is required above the BFE for areas within the 100-year floodplain in order to ensure adequate access is maintained. Because the BFE of the floodplain in the vicinity of the proposed EVA is currently unknown, the proposed project may not meet the minimum clearance requirement and could have the potential to impede or redirect flood flows associated with the 100-year floodplain.

Should the Creekside/Vineyards at Sand Creek Project not be developed, an alternative access roadway may be constructed as part of the proposed project. The alternative roadway would connect the northern portion of the site to the future Sand Creek Road, following the eastern boundary of the CCCFCD property and Basin and crossing Sand Creek. The optional roadway was included as part of the Aviano Project and has been analyzed within the associated EIR. Accordingly, should the alternative access roadway be constructed as part of the proposed project, the project applicant would be required to comply with all applicable mitigation measures related to the roadway set forth in the EIR prepared for the Aviano Project.

Because a portion of the proposed EVA would be located within the 100-year floodplain, the proposed project could impede or redirect flood flows, and a ***potentially significant*** impact would result.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

X-2. Prior to issuance of grading permits, the project applicant shall prepare a site-specific hydraulic analysis to determine the BFE within Zone A in the vicinity of the proposed EVA. If the analysis determines that the portion of the proposed EVA within the floodplain would be less than one foot above the BFE, the elevation of the portion of the EVA within the floodplain shall be raised to at least one foot above the BFE or to the satisfaction of the CCCFCD. The site-specific hydraulic analysis and proof of CCCFCD satisfaction shall be submitted to the City of Antioch Community Development Department.

d. Tsunamis are defined as sea waves created by undersea fault movement, whereas a seiche is a long-wavelength, large-scale wave action set up in a closed body of water such as a lake or reservoir. The project area is located over 50 miles from the Pacific Ocean and tsunamis typically affect coastlines and areas up to one-quarter mile inland. Due to the project's distance from the coast, the project site would not be exposed to flooding risks associated with tsunamis. Seiches do not pose a risk to the proposed project, as the project site is not located adjacent to a large closed body of water. Furthermore, as noted above, the proposed project would not include development of any habitable structures within a Flood Hazard Zone. Based on the above, the proposed project would not pose a risk related to the release of pollutants due to project inundation due to flooding, tsunami, or seiche, and ***no impact*** would occur.

XI. LAND USE AND PLANNING. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Physically divide an established community?	☐	☐	✖	☐
b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	✖	☐

Discussion

a. A project risks dividing an established community if the project would introduce infrastructure or alter land use so as to change the land use conditions in the surrounding community, or isolate an existing land use. The proposed project site does not contain existing housing or other development, and the proposed project would be consistent with residential uses approved to the east and north of the site. The proposed project would not alter the existing general development trends in the area or isolate an existing land use. As such, the proposed project would not physically divide an established community and a ***less-than-significant*** impact would occur.

b. According to the City of Antioch General Plan, the eastern portion of the site is designated Hillside, Estate and Executive Residential/Open Space, while the western portion is designated Commercial/Open Space. The site is zoned Study District. The proposed project would include a General Plan Amendment to the land use map for the Sand Creek Focus Area of the General Plan to change the portion of the site currently designated Hillside, Estate and Executive Residential/Open Space to Medium Low Density Residential/Open Space, as well as an amendment to the text of the Sand Creek Focus Area of the General Plan in order to add an Albers Ranch Sub Area. In addition, the project would require approval of a rezone to change the zoning designation of the site from Study District to HPD, subject to a Master Development Plan. Furthermore, per Section 9-5.2607 of the Municipal Code, all new development within the City is subject to Design Review approval. Approval of the requested GPA and rezone would be subject to the determination of the Antioch City Council.

As discussed throughout this Initial Study, the proposed project would not conflict with City policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect, including, but not limited to, the City's Tree Preservation and Regulation Ordinance, the City's noise standards, and applicable SWRCB regulations related to stormwater. For all CEQA issue areas exclusive of air quality, GHG emissions, and transportation, which will be further evaluated in an EIR, this Initial Study includes mitigation to reduce identified environmental impacts to less-than-significant levels. Therefore, the proposed project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental impact. Thus, a ***less-than-significant*** impact would occur.

XII. MINERAL RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	✖
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	✖

Discussion

a,b. According to the City of Antioch's General Plan EIR, areas identified for new development do not contain known mineral resources that would be of value to the region or residents of the State.[15] Therefore, ***no impact*** to mineral resources would occur as a result of development of the project.

[15] City of Antioch. *Draft General Plan Update Environmental Impact Report* [pg. 5-9]. July 2003.

XIII. NOISE. *Would the project result in:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	✖	☐	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	✖	☐
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	✖

Discussion

a. The following discussion is based on an Environmental Noise Assessment prepared for the proposed project by Saxelby Acoustics (see Appendix E).[16] The report analyzed traffic noise level increases at the project site and at existing sensitive receptors in comparison to the City's noise level standards. In addition, a discussion of construction noise associated with the proposed project is provided. The following terms are referenced in the sections below:

- Decibel (dB): A unit of sound energy intensity. An A-weighted decibel (dBA) is a decibel corrected for the variation in frequency response to the typical human ear at commonly encountered noise levels. All references to decibels (dB) in this report will be A-weighted unless noted otherwise.
- Day-Night Average Level (L_{dn}): The average sound level over a 24-hour day, with a +10 dBA weighting applied to noise occurring during nighttime (10:00 PM to 7:00 AM) hours.
- Community Noise Equivalent Level (CNEL): The cumulative noise exposure over a 24-hour period. Weighting factors of +5 and +10 dBA are applied to the evening and nighttime periods, respectively, to account for the greater sensitivity of people to noise during those periods.

Significance Criteria

The Antioch General Plan Noise Element Section 11.6.1 establishes standards for daytime and nighttime noise levels. The standards are reproduced in below:

> 11.6.1 Noise Objective: Achieve and maintain exterior noise levels appropriate to planned land uses through Antioch, as described below:
>
> - Residential Single Family: 60 dBA CNEL within rear yards;
> - Residential Multi-Family: 60 dBA CNEL within interior open space; and
> - Commercial/Industrial: 70 dBA at front setback.

16 Saxelby Acoustics LLC. *Environmental Noise Assessment, Albers Ranch Project.* June 22, 2021.

In addition, Noise Element Section 11.6.1 establishes standards for maximum allowable noise exposure from transportation noise sources. The maximum allowable exterior noise level is 60 dBA CNEL, applied at outdoor activity areas of single-family residential uses.

Table 2 presented the significance criteria for changes in noise exposure. The table is based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the L_{dn}/CNEL.

Table 2
Significance of Changes in Noise Exposure

Ambient Noise Level Without Project, L_{dn}/CNEL	Increase Required for Significant Impact
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

Source: Federal Interagency Committee on Noise (FICON).

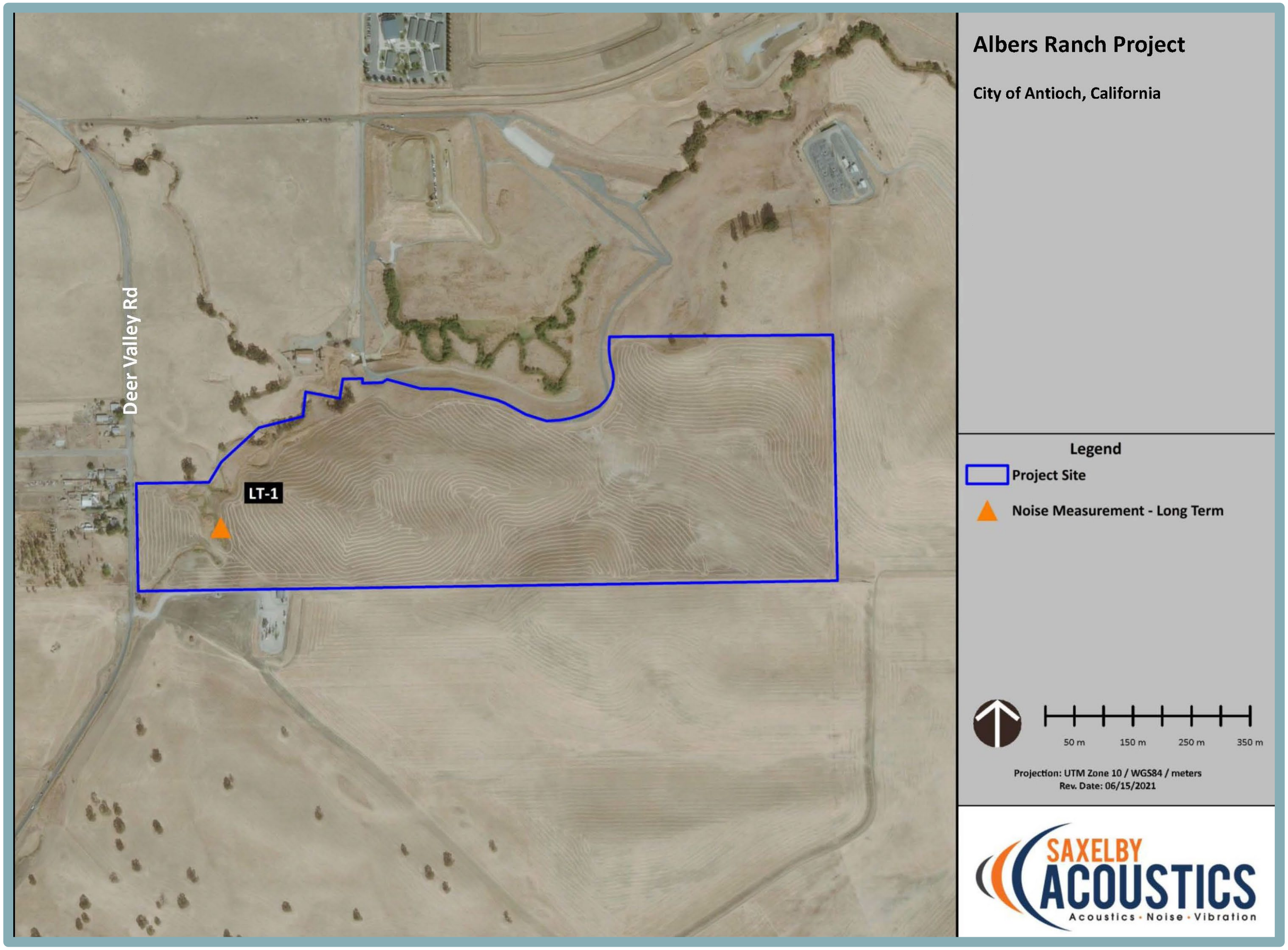
Sensitive Noise Receptors

Some land uses are considered more sensitive to noise than others, and, thus, are referred to as sensitive noise receptors. Land uses often associated with sensitive noise receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise. In the vicinity of the project site, the nearest existing noise sensitive land uses include the rural single-family residential uses to the west of and north of the project site, with the nearest located approximately 40 feet west of the project site, across Deer Valley Road.

Existing Noise Environment

The existing ambient noise environment at the project site is primarily defined by traffic noise emanating from Deer Valley Road, located west of the project site. To quantify the existing ambient noise environment at the project site, a continuous (24-hour) noise level measurement at one location on the project site on September 17, 2019 (Figure 13). The results of the measurements are summarized in Table 3, presented in terms of day-night average (L_{dn}) noise levels, average hourly (L_{eq}) noise levels, and maximum (L_{max}) noise levels. The median value, denoted L_{50}, represents the sound level exceeded 50 percent of the time during the monitoring period.

Figure 13
Noise Measurement Site



Source: Saxelby Acoustics, 2021.

Table 3 **Summary of Existing Background Noise Measurement Data**								
		Average Measured Hourly Noise Levels, dBA						
			Daytime (7:00 AM - 10:00 PM)			**Nighttime (10:00 PM – 7:00 AM)**		
Site	**Date**	**CNEL/L_{dn}**	**L_{eq}**	**L_{50}**	**L_{max}**	**L_{eq}**	**L_{50}**	**L_{max}**
LT-1	9/17/2019 - 9/18/2019	55	50	47	60	49	45	60
Source: Saxelby Acoustics, 2021.								

Project Construction Noise

During the construction of the proposed project, heavy equipment would be used for grading, excavation, paving, and building construction, which would increase ambient noise levels when in use. Noise levels would vary depending on the type of equipment used, how the equipment is operated, and how well the equipment is maintained. In addition, noise exposure at any single point outside the project site would vary depending on the proximity of construction activities to that point. Standard construction equipment, such as graders, backhoes, loaders, and trucks, would be used on-site.

The maximum noise level for various types of construction equipment at a distance of 50 feet is presented in Table 4. As shown in Table 4, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet.

Table 4 **Construction Equipment Noise**	
Type of Equipment	**Maximum Level, dBA at 50 feet**
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85
Source: Roadway Construction Noise Model User's Guide. Federal Highway Administration. FHWA-HEP-05-054. January 2006.	

The nearest noise-sensitive receptors are located within 50 feet of the project boundaries and, thus, could be subjected to project construction noise in excess of the City's 60 dB exterior noise level threshold. Therefore, the temporary increase in noise levels due to construction could be potentially significant.

It is noted that construction activities are limited by the General Plan Noise Element and the Noise Ordinance during certain hours. The General Plan limits noise-producing construction related activities to between the hours of 7:00 AM and 7:00 PM Monday through Saturday, with no construction allowed on Sundays and public holidays. Sections 5-17.04 and 5-17.05 of the City of Antioch Municipal Code restrict construction activities to between the hours of 8:00 AM and 5:00 PM on Monday through Friday when located within 300 feet of residential uses, and to the hours of 9:00 AM and 5:00 PM on Saturdays. Compliance with the allowable construction hours would not affect the conclusion presented above.

Project Operational Noise

Noise generated during operations of the proposed project would be limited to residential noise and traffic noise, as discussed in further detail below.

Residential Noise

The proposed project would include typical residential noise which would be compatible with the adjacent existing residential uses. Therefore, impacts resulting from project operational noise would be considered less than significant.

Traffic Noise

As discussed in Section XVII, Transportation, of this Initial Study, the proposed project would result in increased traffic volumes on local roadways. Thus, the proposed project could cause an increase in traffic noise levels in the project area. To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels are predicted at sensitive receptors for existing and existing plus project conditions.

Existing noise levels due to traffic were calculated using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD 77 108). The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. Project trip generation volumes were provided by the project traffic engineer (Fehr & Peers), and truck usage and vehicle speeds on the local area roadways were estimated from field observations.

Table 5 summarizes the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the project area.

As shown in Table 5, the maximum increase in traffic noise at the nearest sensitive receptor is predicted to be 2.3 dBA following implementation of the proposed project. Based on the ambient noise level data presented in Table 3, the existing transportation noise level is less than 60 dB CNEL. In noise environments where the ambient noise level is less than 60 dB CNEL, a +5.0 dB increase is considered significant (see Table 2). Therefore, the 2.3 dBA increase in traffic noise would be considered less than significant.

Table 5
Predicted Traffic Noise Level and
Project-Related Traffic Noise Level Increases

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Existing + Creekside + Promenade	Existing + Project	Change
Deer Valley Road	Lone Tree Way to Prewett Ranch Drive	62.4	62.6	0.2
Deer Valley Road	South of Prewett Ranch Drive	71.0	71.4	0.4
Lone Tree Way	Deer Valley Road to Hillcrest Avenue	64.0	64.2	0.2
Lone Tree Way	East of Hillcrest Avenue	65.2	65.5	0.3
Prewett Ranch Road	Deer Valley Road to Hillcrest Avenue	58.4	58.8	0.4
Hillcrest Avenue	North of Lone Tree Way	60.6	61.3	0.8
Hillcrest Avenue	Lone Tree Way to Prewett Ranch Drive	61.9	62.6	0.7
Hillcrest Avenue	South of Prewett Ranch Drive	57.5	59.8	2.3

Source: Saxelby Acoustics, 2021.

Conclusion

Residential noise and traffic noise associated with operations of the proposed project would not result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of the standards established in the City's General Plan, or applicable standards of other agencies. However, construction noise could exceed the City's 60 dB exterior noise level threshold at the nearest existing receptor. Thus, a ***potentially significant*** impact related to the generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies could occur.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

XII-1. *Prior to approval of grading permits, the City shall establish the following requirements, via written notation on final improvement plans, subject to review and approval by the City of Antioch Community Development Department:*

- *Construction activities shall be limited to the hours of 8:00 AM and 5:00 PM Monday through Friday when work is within 300 feet of occupied dwellings, and to between the hours of 7:00 AM and 7:00*

PM Monday through Friday when work occurs greater than 300 feet from occupied dwellings. Such activities should be limited to the hours of 9:00 AM and 5:00 PM on Saturdays. No construction shall be allowed on Sundays and public holidays.

- *The construction contractor shall use temporary noise attenuation fences to protect sensitive receptors west of the project site.*
- *The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.*
- *Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.*
- *When not in use, motorized construction equipment shall not be left idling for more than five minutes.*
- *Stationary equipment (power generators, compressors, etc.) shall be located at the furthest practical distance from nearby noise-sensitive land uses or sufficiently shielded to reduce noise-related impacts.*

b. Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities (PPV) in inches per second (in/sec). Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of PPV. Table 6 indicates that the threshold for architectural damage to structures is 0.20 in/sec PPV. Per the Environmental Noise Assessment, a threshold of 0.2 in/sec PPV is considered to be a reasonable threshold for short-term construction projects.

During project construction, heavy equipment would be used for grading, excavation, paving, and building construction, which would generate localized vibration in the immediate vicinity of construction. The range of vibration source levels for construction equipment commonly used in similar projects are shown in Table 7.

The Table 7 data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at distances of 26 feet. Sensitive receptors which could be impacted by construction related vibrations associated with the proposed project, especially vibratory compactors/rollers, would be located approximately 40 feet, or further, from the proposed construction activities. At such distances, construction vibrations would not exceed acceptable levels, and a ***less-than-significant*** impact would occur.

c. The nearest airport to the site is the Byron Airport, located approximately 10 miles southeast of the site. Given the substantial distance between the airport and the project site, noise levels resulting from aircraft at the nearest airport would be negligible at the proposed project site. Therefore, ***no impact*** would occur.

Table 6
Effects of Vibration on People and Buildings

PPV		Human Reaction	Effect on Buildings
mm/sec	in/sec		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Transportation Related Earthborne Vibrations. Caltrans. TAV-02-01-R9601. February 2002.

Table 7
Vibration Levels for Various Construction Equipment

Type of Equipment	PPV at 25 feet (inches/second)	PPV at 50 feet (inches/second)	PPV at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (< 0.20 at 26 feet)	0.074	0.026

Source: Transit Noise and Vibration Impact Assessment Guidelines. Federal Transit Administration. May 2006.

XIV. POPULATION AND HOUSING. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure)?	☐	☐	✖	☐
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	✖

Discussion

a. The proposed project would include the development of 294 single-family residential units, a future 150-bed assisted living facility, and neighborhood commercial land uses, thereby inducing population growth in the project area. Per the City's 2015-2023 Housing Element, the City of Antioch had an average household size of 3.15 persons per household.[17] Using the 3.15 persons per household figure and assuming one person per bed for the future 150-bed assisted living facility, the proposed project could provide housing for up to approximately 1,076 people (294 proposed households X 3.15 persons per household + 150 assisted living residents = 1,076 new residents).

According to the City of Antioch Housing Element, Antioch's population increased by approximately 4.0 percent between the years 2010 and 2014, from 102,372 residents to 106,455 residents.[18] Contra Costa County's population has increased at a similar pace, growing by approximately 3.6 percent from 2010 to 2014, from 1,049,025 to 1,087,008. Per the City's Housing Element, the ABAG estimates that the City's population would be 116,200 in 2030, increasing by 9,745 persons. Assuming that the proposed project would be fully built out and operating at full capacity by 2030, the project's contribution to the overall population increase by 2030 would not contribute to an increase above the anticipated population levels. It should be noted that the City of Antioch has previously considered buildout of the proposed project site (as well as the Sand Creek Focus Area) as part of the General Plan.

Therefore, the proposed project would not result in substantially more intensive population growth beyond what has been previously analyzed for the site, and a ***less-than-significant*** impact would occur.

b. The proposed project site is currently vacant, and does not include existing housing or other habitable structures. As such, the proposed project would not displace a substantial number of existing housing or people and would not necessitate the construction of replacement housing elsewhere. Therefore, ***no impact*** would occur.

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17 City of Antioch. *Housing Element* [pg. 2-9]. Adopted April 14, 2015.
18 City of Antioch. *City of Antioch Housing Element 2015-2023* [pg. 2-2]. Adopted April 14, 2015.

XV. PUBLIC SERVICES. *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Fire protection?	☐	☐	✖	☐
b. Police protection?	☐	☐	✖	☐
c. Schools?	☐	☐	✖	☐
d. Parks?	☐	☐	✖	☐
e. Other Public Facilities?	☐	☐	✖	☐

Discussion

a. Fire protection services for the project area are provided by the Contra Costa County Fire Protection District (CCCFPD). The CCCFPD is an "all-hazards" organization providing fire suppression, paramedic emergency medical services (EMS), technical rescue, water rescue, and fire prevention/investigation services to more than 600,000 residents across a 304 square mile coverage area. The CCCFPD operates 25 fire stations and responds to approximately 45,000 incidents annually. Four of the fire stations are located within the City of Antioch. Station 88 is located approximately three miles northeast of the project site. A future CCCFPD fire station is planned for development on a two-acre property as part of the approved The Ranch Residential Project. The future fire station would house up to four firefighting equipment vehicles. Upon completion of the proposed project, the CCCFPD would provide fire protection services to the project site.

The proposed project would be required to pay applicable fire protection fees per the City's Master Fee Schedule. Additionally, the City would require the project applicant to participate in or assist in the formation of a Community Facilities District (CFD) to fund the incremental increase in demand for fire protection and ambulance services associated with the proposed project. In addition, the proposed project would be constructed in accordance with the fire protection requirements of the most recent California Fire Code. The CCCFPD and the City's Building Inspection Services Division would review the project building plans to ensure compliance with all code requirements. Therefore, the proposed project would have a ***less-than-significant*** impact related to the need for new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts.

b. The Antioch Police Department (Antioch PD) currently provides police protection services to the project area. The Antioch PD operates out of the police headquarters at 300 L Street, and is currently staffed with 104 sworn and 33 non-sworn employees.[19] According to the Antioch General Plan EIR, population growth has created an increased demand for police-related services, and consequently a need for additional Antioch PD staff. The City of Antioch General Plan establishes a goal for the Antioch PD staffing ratio to be between 1.20 to 1.50 officers per 1,000 residents.[20] Per the City's Housing Element, the City of

[19] City of Antioch. *About APD*. Available at: http://www.antiochca.gov/police/about-apd/. Accessed June 2021.
[20] City of Antioch. *Draft General Plan Update Environmental Impact Report [pg. 4.11-1]*. July 2003.

Antioch had a population of 106,455 in 2014. Thus, the Antioch PD staffing ratio is approximately 1.0 per 1,000 residents.

The proposed project would increase the demand for police protection services at the site. However, the project applicant would be required to pay Development Impact Fees for police facilities per Section 9-3.50 of the City Municipal Code, and the project site would be required to annex into a CFD for financing police services. Therefore, the project would have a ***less-than-significant*** impact related to the need for new or physically altered police protection facilities, the construction of which could cause significant environmental impacts.

c. School services in the City are mostly provided by the Antioch Unified School District (AUSD). Parts of Antioch (mostly within the Sand Creek and East Lone Tree focus area) are served by the Brentwood Unified and the Liberty School Districts. School services within the project site are provided by the Brentwood Unified School District (BUSD). The proposed project would include the development of 294 single-family residence and, thus, would increase demand for school facilities and services. It should be noted that the proposed project may consist of a 150-bed future assisted living facility and neighborhood commercial land uses. The assisted living facility and neighborhood commercial land uses would not house school-age residents and would not increase the demand for school facilities and services.

The BUSD collects development fees for new residential projects on a per square foot basis. The development fees serve to offset school facility costs associated with serving new students. Proposition 1A/SB 50 prohibits local agencies from using the inadequacy of school facilities as a basis for denying or conditioning approvals of any "[…] legislative or adjudicative act…involving …the planning, use, or development of real property" (Government Code 65996[b]). Satisfaction of the Proposition 1A/SB 50 statutory requirements by a developer is deemed to be "full and complete mitigation." Because the project applicant would be required to pay development fees to the BUSD, the proposed project would result in a ***less-than-significant*** impact regarding an increase in demand for schools.

d,e. Consistent with the requirements of the Quimby Act, Standard 3.5.7.2 in the City of Antioch General Plan and Section 9-4.1004 of the Antioch Municipal Code set a standard of five acres of parks and open space per 1,000 residents.[21] The City of Antioch receives land for parks through land dedications or purchases funded through fee collection. The Antioch Municipal Code requires a dedication of parkland at the rate of 0.015 acres per single-family unit. Given that the proposed project would include a total of 294 residential-units, the project would be required to include a minimum of 4.41 acres of dedicated public parkland. Alternatively, fees may be paid in lieu of parkland dedication at a rate of $1,500 for single-family detached units, and $1,100 for single-family attached units.

In total, approximately 49.1 acres of the site would be retained as open space for parks, open space, recreation, and water quality facilities, including a 1.5-acre private park proposed in the southeastern portion of the project site. The proposed project would also include a number of community trails on-site that would provide access to the designated open space and recreational areas on the site. Pursuant to Section 9-4.1010 of the City's Municipal Code, a portion of the total 49.1 acres of open space land and private parks

[21] City of Antioch. *City of Antioch General Plan* [pg. 3-12]. November 23, 2003.

proposed may count for park credits against the amount of land required to be dedicated, subject to final determination by the City Parks and Recreation Commission. If the City determines that the minimum parkland dedication requirements are not met for the project, the project applicant would be subject to payment of in-lieu park fees pursuant to Sections 9-4.1005 through 9-4.1007 of the Municipal Code. In addition, the project would be required to pay Development Impact Fees, which include a component for parks. Therefore, the proposed project would have a ***less-than-significant*** impact related to the need for new or physically altered parks or other public facilities, the construction of which could cause significant environmental impacts.

XVI. RECREATION. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	✖	☐
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	✖	☐

Discussion

a,b. The proposed project would include the development of 294 residential units, as well as a future 150-bed assisted living facility and neighborhood commercial development. Thus, the proposed project could result in an increase in the use of existing neighborhood and regional parks, and/or other recreational facilities. While the project site is located approximately three miles southeast of the Contra Loma Regional Park, project residents would be more likely to use park facilities included in the proposed project.

Approximately 49.1 acres of the site would be retained as open space for parks, open space, recreation, and water quality facilities, including a 1.5-acre private park proposed in the southeastern portion of the project site. In addition, the proposed project would include a number of community trails on-site that would provide access to the designated open space and recreational areas on the site. The designated open space/maintenance trail in Parcel Y would provide community access to Sand Creek. The proposed project would also include an open space picnic area between lots 53 and 54 south of Sand Creek.

As noted in Section XIII, Public Services, above, the proposed project would meet the park dedication requirements established by Section 9-4.1004 of the Antioch Municipal Code, through dedication of parkland, payment of in-lieu park fees, or a combination of both. Therefore, the increase in population associated with the proposed project would not be expected to result in substantial physical deterioration of any existing neighborhood or regional parks or other recreational facilities, and would not result in adverse physical effects related to the construction or expansion of new facilities. Thus, a ***less-than-significant*** impact would occur.

XVII. TRANSPORTATION. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	✖	☐	☐	☐
b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	✖	☐	☐	☐
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	✖	☐	☐	☐
d. Result in inadequate emergency access?	✖	☐	☐	☐

Discussion

a. The proposed project would include development of 294 single-family residential units, a future 150-bed assisted living facility, and commercial uses, which would result an increase in vehicle traffic on the street system surrounding the project area. In addition, the project has the potential to generate new bicycle and pedestrian traffic in the area. As noted below, determination of traffic impacts based solely on vehicle level of service (LOS) is no longer allowable based on CEQA Guidelines Section 15064.3. However, the potential remains for the proposed project to result in conflicts with General Plan policies related to transportation facilities, including transit, roadway, bicycle, and pedestrian facilities. Therefore, a ***potentially significant*** impact could occur.

Further analysis of this impact will be discussed in the Transportation chapter of the Albers Ranch EIR being prepared for the project.

b. Section 15064.3 of the CEQA Guidelines provides specific considerations for evaluating a project's transportation impacts. Pursuant to Section 15064.3, analysis of VMT attributable to a project is the most appropriate measure of transportation impacts. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Determination of impacts based on VMT have been required by law Statewide since July 1, 2020. Although neither the City of Antioch nor the Contra Costa County Transportation Authority (CCTA) has established any standards or thresholds on VMT, the Office of Planning and Research (OPR) suggests that residential projects that generate VMT per capita at 15 percent less than the existing City or regional average could be considered less than significant. The proposed project would result in increased VMT associated with future residents travelling between the project site and other locations within the project region. Further analysis is required to evaluate whether the proposed project would be consistent with the OPR's suggested guidelines related to VMT. Therefore, the proposed project could conflict with CEQA Guidelines Section 15064.3(b) related to VMT, and a ***potentially significant*** impact could occur.

Further analysis of this impact will be discussed in the Transportation chapter of the Albers Ranch EIR being prepared for the project.

c,d. Primary access to the proposed project would be provided by a new on-site roadway connecting to the planned Hillcrest Avenue extension east of the site. The connection to Hillcrest Avenue is contingent upon construction of the Creekside/Vineyards at Sand Creek Project. In the event that the Creekside/Vineyards at Sand Creek Project is not constructed, access to the proposed project may be provided by an alternate roadway connecting the northern portion of the project site to the future Sand Creek Road included as an IOD as part of the Aviano Project. Within the project site, all proposed internal streets would be private and would be consistent with applicable City of Antioch design standards. Further analysis is required to evaluate whether the proposed access points would substantially increase hazards due to a geometric design feature or incompatible uses, or provide adequate emergency access to the site. An EVA only roadway would provide secondary access from Deer Valley Road to the western portion of the project site. The proposed EVA road would follow the alignment of an existing unimproved private access road that currently crosses the tributary to Sand Creek in the western portion of the site. An existing culvert is located under the portion of the EVA that crosses the tributary. Because a portion of the EVA would be located within a floodplain and over an existing culvert, further analysis is necessary to ensure that the EVA is designed sufficient to withstand the weight of emergency vehicles.

Construction traffic associated with the proposed project and off-site improvements would include heavy-duty vehicles that would share the area roadways with normal vehicle traffic, creating potential conflicts with other roadway users, as well as transport of construction material, and daily construction employee trips to and from the site. The short-term increase in traffic that would occur during the construction phase of the proposed project could temporarily disrupt daily traffic flows on area roadways, including emergency response vehicles.

Thus, a ***potentially significant*** impact could occur related to increased hazards due to geometric design features or incompatible uses and inadequate emergency access.

Further analysis of this impact will be provided in the Transportation chapter of the Albers Ranch EIR being prepared for the project.

XVIII. TRIBAL CULTURAL RESOURCES. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k).	☐	✖	☐	☐
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	✖	☐	☐

Discussion

a,b. As discussed in Section V, Cultural Resources, of this Initial Study, known historic resources do not exist on-site or in the off-stie improvement area. In addition, based on the results of the records search, review of archival maps and photographs, Native American settlement patterns, geoarchaeological study, site specific variables, field survey, and assessment of direct or indirect project impacts conducted as part of the Cultural and Paleontological Resources Inventory prepared for the proposed project, the potential for the discovery of buried archaeological materials within the project area is considered to be low.

In compliance with AB 52 (PRC Section 21080.3.1), a project notification letter was distributed to the Amah Mutsun Tribal Band of Mission San Juan Bautista, Chicken Ranch Rancheria of Me-Wuk Indians, Indian Canyon Mutsun Band of Costanoan, Muwekman Ohlone Indian Tribe of the SF Bay Area, Nashville Enterprise Miwok-Maide-Nishinam Tribe, North Valley Yokuts Tribe, the Ohlone Indian Tribe, Tule River Indian Trive, Wilton Rancheria, and the Confederated Villages of Lisjan. The letters were distributed on May 19, 2021. Requests for consultation were not received within the mandatory 30-day response period.

Based on the above, known Tribal Cultural Resources do not exist within the proposed project site or off-site improvement area. Nevertheless, the possibility exists that construction of the proposed project could result in a substantial adverse change in the significance of a Tribal Cultural Resource if previously unknown cultural resources are uncovered during grading or other ground-disturbing activities. Thus, a ***potentially significant*** impact to Tribal Cultural Resources could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

XVIII-1. Implement Mitigation Measures V-1 and V-2.

XIX. UTILITIES AND SERVICE SYSTEMS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	✖	☐
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	✖	☐
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	✖	☐
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	✖	☐
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	✖	☐

Discussion

a-c. Water supply, wastewater treatment, stormwater drainage, electric power, natural gas, and telecommunications facilities necessary to serve the proposed project are described in the following sections.

Water Supply

Principal sources of raw water supply to the City of Antioch are the Sacramento/San Joaquin Rivers Delta and the Contra Costa Canal, which are stored in the Antioch Municipal Reservoir. Buildout of the Sand Creek Focus Area, including the project site, is accounted for in the City's Water System Master Plan Update, which provides a detailed analysis of the City's water distribution system. The Water System Master Plan Update included the preparation of a Capital Improvement Program (CIP) that includes improvements necessary to provide safe and reliable water delivery throughout the City based on projected growth and associated increases in demand on the City's distribution system.

Potable water would be distributed to the project site by an extension of the existing 12-inch Zone III trunk line beneath Hillcrest Avenue. The existing 12-inch Zone III trunk line would continue south to I Street, planned by the Creekside/Vineyards at Sand Creek Project, and the head west to the project boundary. Additionally, in-tract streets would include water lines that would be looped from the western project boundary up Deer Valley Road to connect to the City's existing water system. The water distribution system improvements planned for in the Water System Master Plan Update and associated CIP, as well as the infrastructure improvements included in the proposed project, would be capable of accommodating the increased demand for water supplies associated with buildout of the proposed project.

Per the City's 2015 Urban Water Management Plan (UWMP), adequate water supplies will be available to accommodate buildout of the City under normal year, single year, and multiple-dry year demand scenarios, accounting for mandatory measures included in the City's Water Shortage Contingency Plan. Although the proposed project is not specifically identified in the City's 2015 UWMP, the Sand Creek Focus Area is included, and the City's growth projections and associated water demand projections (an additional 3,393 mgy from 2015 to 2040) accommodate the proposed project's projected water demand of 36 mgy.

Therefore, the proposed project would not require or result in the relocation or construction of new or expanded off-site water facilities, the construction or relocation of which could cause significant environmental effects, and sufficient water supplies would be available to serve the proposed project and reasonably foreseeable future development during normal, dry, and multiple dry years.

Wastewater Conveyance and Treatment

The City maintains and owns the local sewage collection system and is responsible for the collection and conveyance of wastewater to the Delta Diablo Wastewater Treatment Plant (WWTP). Delta Diablo owns and operates the regional interceptors and WWTP. The project site is located within the Delta Diablo service area. The City of Antioch is responsible for the wastewater collection system from the project site to the designated Delta Diablo regional wastewater conveyance facility. An EIR for the expansion of the wastewater treatment plant capacity to an average dry weather flow of 22.7 million gallons per day (mgd) was completed in April 1988. However, the current WWTP NPDES Permit limits average dry weather flow to 19.5 mgd. From October 2014 through May 2019, the plant treated a daily average of approximately 13 mgd; the highest reported average daily flow was 22.1 mgd.[22] Sewage flow to the plant does not fluctuate seasonally, as sewer and storm water systems are separate.[23] Funds for future plant expansion are collected by the City on behalf of Delta Diablo from sewer connection fees.

The General Plan EIR bases anticipated wastewater demand on a generation rate of 220 gpd per residence and 1,000 gpd per acre for commercial uses. The proposed project would include the construction of 294 single-family residential units, as well as a future 150-bed assisted living facility, for a total of 444 units, if conservatively assuming each bed of the assisted living facility as a unit. Thus, the proposed project would be anticipated to generate approximately 97,680 gpd of wastewater from the residential uses on site. The proposed project would include a total of 1.3 acres of commercial development, which would result in an estimated wastewater generation of approximately 1,300 gpd. Therefore, the proposed project would be anticipated to generate a total of 98,980 gpd of wastewater. Sanitary sewer service would be provided by in-tract sewer lines that would connect to I-Street in the Creekside/Vineyards at Sand Creek Project. The Creekside/Vineyards at Sand Creek Project includes a main sewer line that would connect to a planned sewer line in Sand Creek Road.

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22 San Francisco Bay Regional Water Quality Control Board. *Order No. R2-2019-0035, NPDES No. CA0038547*. Adopted December 11, 2019.

23 City of Antioch. *Draft General Plan Update Environmental Impact Report* [pg. 4.12-2]. July 2003.

An increase of 98,980 gpd is relatively minor compared to the 13 mgd of average dry weather flow currently treated by the WWTP, and would not have a substantial impact on the available capacity of the WWTP. The project applicant would be required to pay sewer connection fees, which work to fund needed sewer system improvements. Because the project applicant would pay sewer connection fees, and adequate long-term wastewater treatment capacity is available to serve full build-out of the project, the project would not require or result in the relocation or construction of new or expanded off-site wastewater facilities, the construction or relocation of which could cause significant environmental effects. In addition, adequate wastewater treatment capacity is available to serve the project's projected demand in addition to the provider's existing commitments

Stormwater Drainage

The project site is currently undeveloped, vacant land consisting primarily on non-native vegetation. Completion of the proposed project would increase site runoff due to the introduction of impervious surfaces to the site. As discussed in further detail in Section IX, Hydrology and Water Quality, of this Initial Study, the SWCP for the proposed project conforms with the most recent Contra Costa Clean Water Program Stormwater C.3 Guidebook and verifies that the proposed project would comply with all City stormwater requirements. In compliance with the C.3 Guidebook, the proposed project would include on-site detention and bioretention facilities sized to exceed the minimum volume requirement necessary to adequately manage all runoff from the proposed impervious surfaces. Thus, the project would not require new or expanded off-site stormwater infrastructure. Because the proposed detention and bio-retention facilities would be designed with adequate capacity to capture and treat runoff from proposed impervious surfaces, the proposed project would not generate runoff in excess of the City's existing stormwater system's capacity.

Electric Power, Natural Gas, and Telecommunications

The proposed project would include new connections to existing electric power, natural gas, and telecommunications facilities located in the project vicinity. Thus, substantial expansion of off-site utilities would not be required to serve the proposed residential development, and associated environmental effects would not occur.

Conclusion

Based on the above, the proposed project would not require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. In addition, sufficient water supplies would be available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years, and adequate wastewater treatment capacity is available to serve the project's projected demand in addition to the provider's existing commitments. Thus, a ***less-than-significant*** impact would occur.

d,e. Republic Services provides solid waste collection, disposal, recycling, and yard waste services to the City, including the project site. Solid waste and recyclables from the City are taken to the Contra Costa Transfer and Recovery Station in Martinez. Solid waste is transferred from the Transfer and Recovery Station to the Keller Canyon Landfill in Pittsburg. The Keller Canyon Landfill site is 1,399 acres, 244 of which comprise the actual current disposal acreage. The landfill is permitted to accept 3,500 tons of waste per day and has a total estimated permitted capacity of approximately 75 million cubic yards. The total remaining capacity of the landfill is 63,408,410 million cubic yards (approximately 84 percent of total capacity).[24] Due to the substantial amount of available capacity remaining at Keller Canyon Landfill, sufficient capacity would be available to accommodate the project's solid waste disposal needs. Therefore, a ***less-than-significant*** impact related to solid waste would occur as a result of the proposed project.

[24] CalRecycle. *SWIS Facility/Site Activity Details Keller Canyon Landfill (O7-AA-0032)*. Available at: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/4407?siteID=228. Accessed June 2021.

XX. WILDFIRE. *If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	✖	☐
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	✖	☐
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	✖	☐
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	✖	☐

Discussion

a-d. According to the CAL FIRE Fire and Resource Assessment Program, the proposed project site is not located within a Very High Fire Hazard Severity Zone.[25] In addition, the site is not located in a State Responsibility Area. Thus, the proposed project would not be expected to be subject to or result in substantial adverse effects related to wildfires, and a ***less-than-significant*** impact would occur.

[25] California Department of Forestry and Fire Protection. *Contra Costa County, Very High Fire Hazard Severity Zones in LRA*. January 7, 2009.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE.	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	✖	☐	☐
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	✖	☐	☐	☐
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	✖	☐	☐	☐

Discussion

a. As discussed in Section IV, Biological Resources, of this Initial Study, implementation of the proposed project would have the potential to result in adverse effects to special-status plant and wildlife species. In addition, while unlikely, the project could result in impacts related to eliminating important examples of major periods of California history or prehistory associated with undiscovered archeological and/or paleontological resources during project construction. However, the proposed project would be required to comply with applicable City of Antioch General Plan and Municipal Code policies related to biological and cultural resources. In addition, this Initial Study includes mitigation measures that would reduce any related potential impacts to less-than-significant levels. With implementation of the mitigation measures required by this Initial Study, as well as compliance with General Plan policies and all applicable sections of the Municipal Code, development of the proposed project would reduce any potential impacts associated with the following: 1) degradation of the quality of the environment; 2) substantial reduction of or impact to the habitat of fish or wildlife species; 3) causing fish or wildlife populations to drop below self-sustaining levels; 4) threatening to eliminate a plant or animal community; 5) reduction of the number or restrict the range of a rare or endangered plant or animal; or 6) elimination of important examples of the major periods of California history or prehistory.

Based on the above, a ***potentially significant*** impact could occur if the mitigation measures described in this Initial Study are not implemented.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

XXI-1. Implement Mitigation Measures IV-1 through IV-13, V-1, and V-2.

b. The proposed project in conjunction with other development within the City of Antioch could incrementally contribute to cumulative impacts in the area. As discussed in Section III, Air Quality, and Section VIII, Greenhouse Gas Emissions, of this Initial Study, construction activities and increased vehicle trips generated by operation of the proposed project, as well as other activities associated with project operations, could result in conflicts with applicable standards related to air quality and GHG emissions. In addition, as discussed in Section XVII, Transportation, project vehicle trips, increase in population, and VMT could result in conflicts with established operations standards for local roadway, bicycle, pedestrian, and transit facilities and/or other established local and State standards. Thus, the proposed project could have impacts that are individually limited, but cumulatively considerable, and a ***potentially significant*** impact could occur.

   Further analysis of this impact will be discussed in the Air Quality and Greenhouse Gas Emissions chapter and Transportation chapter of the Albers Ranch EIR being prepared for the project.

c. As described in this Initial Study, implementation of the proposed project could result in temporary impacts related to excess noise levels. In addition, the project could expose humans to hazards relating to seismic ground shaking and unstable geologic units. However, the proposed project would be required to implement the project-specific mitigation measures within this Initial Study, as well as applicable policies of the City of Antioch General Plan, to reduce associated direct or indirect impacts to human beings. With implementation of the identified mitigation measures, identified project-specific impacts related to such issues would be reduced to less-than-significant levels. However, further analysis is required to ensure that TAC emissions associated with project construction or other air pollutant emissions do not result in adverse health effects at nearby sensitive receptors. Thus, a ***potentially significant*** impact could occur.

   Further analysis of this impact will be discussed in the Air Quality and Greenhouse Gas Emissions chapter of the Albers Ranch EIR being prepared for the project.

APPENDIX A

TECHNICAL BIOLOGICAL REPORT

LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

ALBERS PROJECT SITE
TECHNICAL BIOLOGICAL REPORT
ANTIOCH, CALIFORNIA

Prepared by

LIVE OAK ASSOCIATES, INC.

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Pam Peterson, Sr. Project Manager/Plant and Wetland Ecologist
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August 9, 2021 PN 2577-01

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TABLE OF CONTENTS

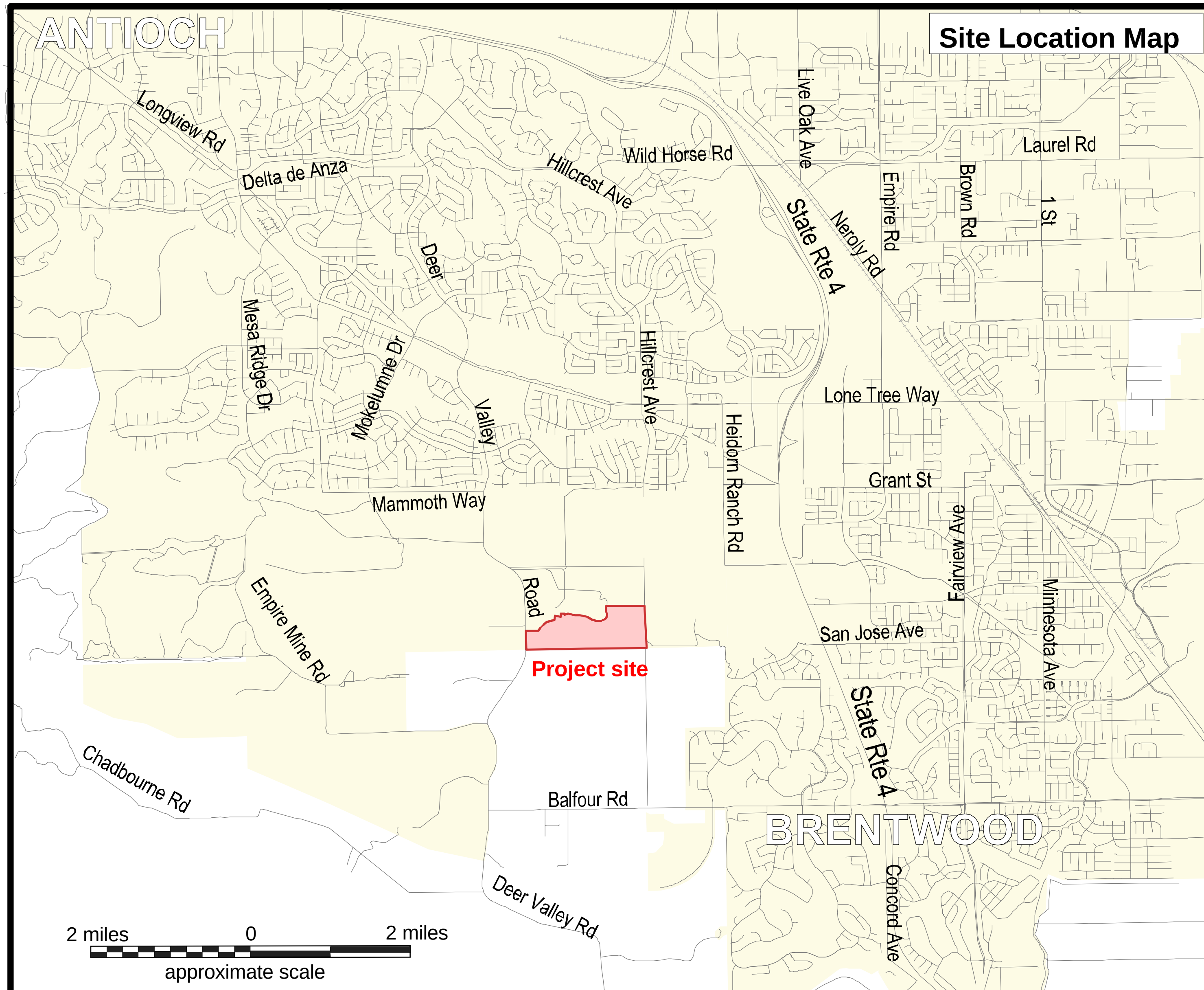
1 INTRODUCTION

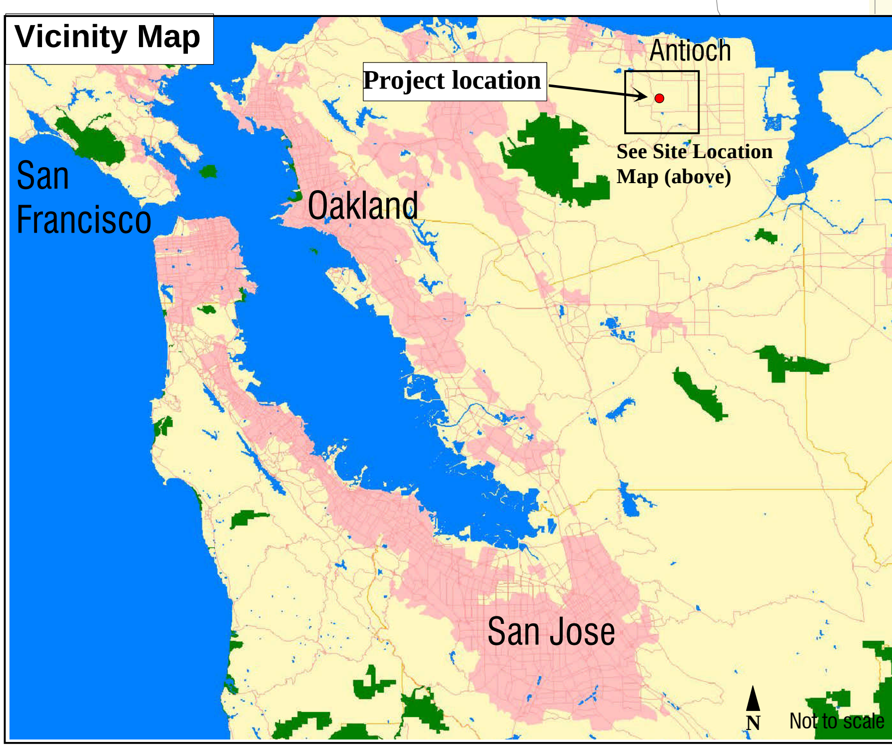
The project site located at east of Deer Valley Road south of Sand Creek south of the developed portion of the City of Antioch, Contra Costa County, California ("project site"; Figure 1) was evaluated by Live Oak Associates, Inc. (LOA) to ascertain whether or not build-out of a proposed residential development ("project") would have a significant impact, as defined by the California Environmental Quality Act (CEQA), on the biological resources of the site and region. This report describes the biotic resources of the approximately 96.47-acre project site and evaluates potential impacts to these biotic resources resulting from the proposed project. The site can be found on the Antioch South U.S.G.S. 7.5' quadrangle in Section 8 of Township 1 North, Range 2 East.

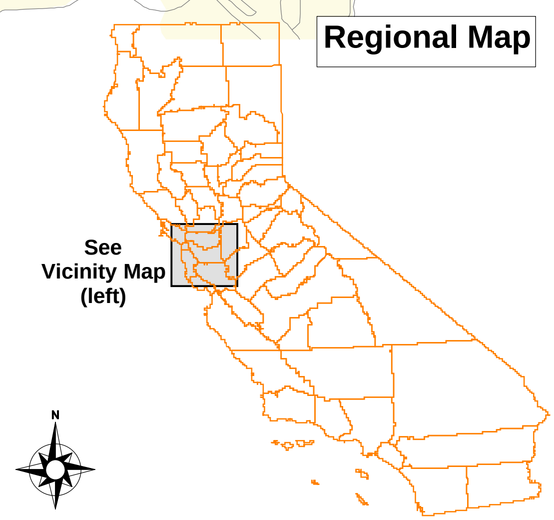
In general, the development of parcels can damage or modify biotic habitats used by sensitive plant and wildlife species. In such cases, site development may be regulated by state or federal agencies, subject to provisions of CEQA, and/or covered by local policies and ordinances. Therefore, this report addresses: 1) sensitive biotic resources potentially occurring in the project site; 2) the federal, state, and local laws regulating such resources, 3) possible significant impacts to these resources that could result from the project; and 4) mitigation measures that would reduce these impacts to a less-than-significant level as defined by CEQA.

The analysis of impacts, as discussed in Section 3.0 of this report, was based on the known and potential biotic resources of the project site discussed in Section 2.0. Sources of information used in the preparation of this analysis included: 1) the *California Natural Diversity Data Base* (RareFind 5; CDFW 2021); 2) the *California Rare Plant Rank* (CNPS 2021); 3) manuals and references related to plants and animals of the region; and 4) policies and ordinances of Antioch that relate to biotic resources.

A field survey of the project site was conducted on May 24, 2021 by LOA staff ecologist Katrina Krakow and LOA plant and wetland ecologist Pam Peterson.







Live Oak Associates, Inc.

Albers Ranch
Site / Vicinity Map

Date	Project #	Figure #
5/11/2021	2577-01	1

1.1 PROJECT DESCRIPTION

Based on the Vesting Tentative Map for the Albers Property (CBG Engineers 2021), the majority of the site would be developed into a 288 single-family home subdivision, roads and assisted living development in the western portion of the site near Deer Valley Road. The remainder of the site would include approximately 40 acres of open space, approximately seven acres of water quality facilities including detention basins, and a 1.5-acre park.

2 EXISTING CONDITIONS

At the time of the field survey, the project site consisted primarily of dry-farmed wheat with some native grassland areas and a portion of the Sand Creek riparian area. Structures are absent from the site. The irregularly shaped site is bounded by Deer Valley Road to the west, dry-farmed wheat and an oil extraction area to the south, dry-farmed wheat to the east, and Sand Creek to the north. The site has hilly topography with elevations ranging from a low of approximately 180 feet (55 meters) National Geodetic Vertical Datum (NGVD) in the northwestern portion of the site to 284 feet NGVD (87 meters) in the southeastern portion of the site.

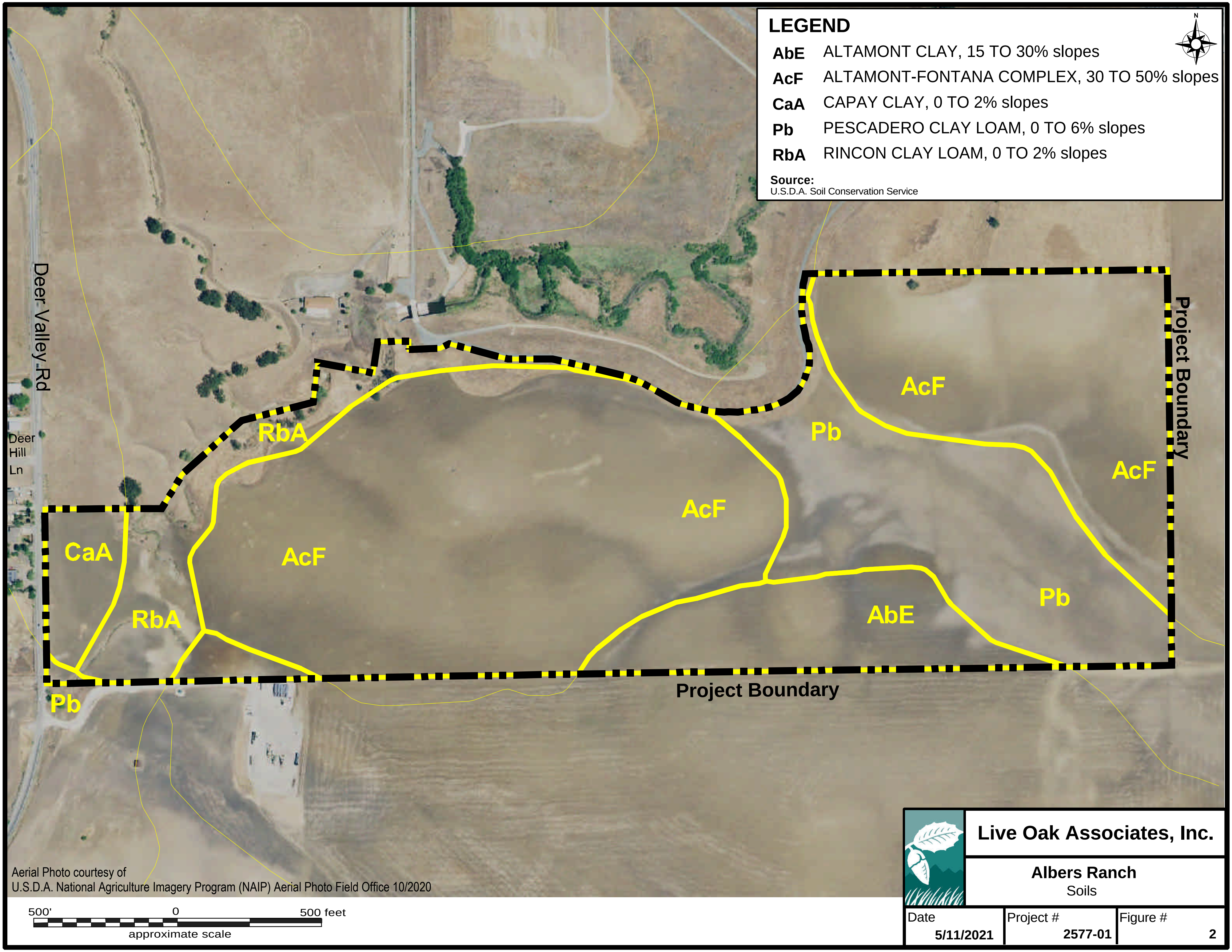
Annual precipitation in the general vicinity of the project site is about 15-20 inches, almost 85% of which falls between the months of October and March. Virtually all precipitation falls in the form of rain.

Five soil map units occur on the site (NRCS 2021) which are discussed below in Table 1 (Figure 2).

TABLE 1. SOILS OCCURRING ON THE ALBERS RANCH PROJECT SITE (NRCS 2021).

Soil Series/Soil	Map Symbol	Parent Material	Drainage/Surface Permeability	Hardpan/ Duripan	Hydric
ALTAMONT SERIES Altamont clay, 15 to 30% slopes	AbE	Residuum weathered from sandstone and shale	Well-drained/ Moderately low to moderately high	No	No*
ALTAMONT-FONTANA SERIES Altamont-Fontana complex, 30 to 50% slopes	AcF	Residuum weathered from sandstone and shale	Well-drained/Very low to moderately high	No	No*
BRIONES SERIES Briones loamy sand, 5 to 30% slopes	BdE	Residuum weathered from sandstone	Well-drained/ Moderately high	No	No
CAPAY SERIES Capay clay, 0 to 30% slopes	CaA	Clayey alluvium derived from metamorphic and sedimentary rock	Moderately well-drained/ Moderately low to moderately high	No	No*
PESCADERO SERIES Pescadero clay loam, 0 to 6% slopes	Pb	Alluvium weathered from sandstone and shale	Poorly drained/ Moderately low to moderately high	Yes	Yes
RINCON SERIES Rincon clay loam, 0 to 2% slopes	Rba	Alluvium derived from sedimentary rock	Well-drained/ Moderately low to moderately high	No	No

*Although soil is not considered a hydric soil, minor soil components of this series are considered hydric, so hydric inclusions may occur.



LEGEND
AbE ALTAMONT CLAY, 15 TO 30% slopes
AcF ALTAMONT-FONTANA COMPLEX, 30 TO 50% slopes
CaA CAPAY CLAY, 0 TO 2% slopes
Pb PESCADERO CLAY LOAM, 0 TO 6% slopes
RbA RINCON CLAY LOAM, 0 TO 2% slopes
Source:
U.S.D.A. Soil Conservation Service
N
Deer Valley Rd
Deer Hill Ln
CaA
RbA
RbA
AcF
AcF
Pb
Pb
AcF
AcF
AbE
Pb
Pb
Project Boundary
Project Boundary
Aerial Photo courtesy of
U.S.D.A. National Agriculture Imagery Program (NAIP) Aerial Photo Field Office 10/2020
500' 0 500 feet
approximate scale
Live Oak Associates, Inc.
Albers Ranch
Soils
Date 5/11/2021
Project # 2577-01
Figure # 2

None of these soils are considered serpentine; therefore, special status plants adapted to serpentine soils are not expected to occur on the site, however, special status plants adapted to alkaline and hydric soils may occur on the site. Pescadero Clay Loam is considered a predominantly hydric soil. This soil type occurs within the eastern half of the site and cuts across the site. Hydric soils are soils are defined as saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions they support hydrophytic vegetation.

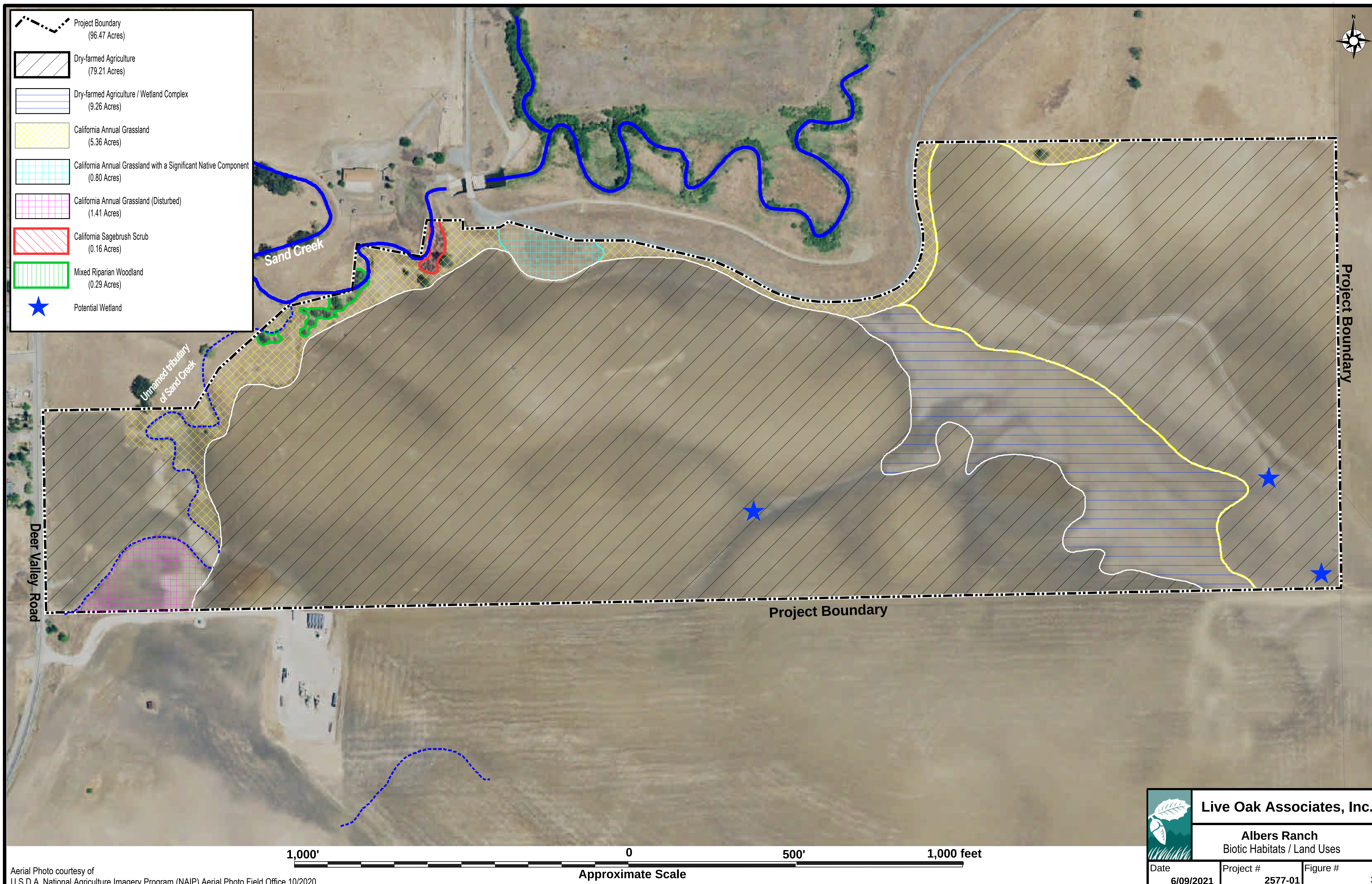
2.1 BIOTIC HABITATS

Seven land cover types have been identified on the site and these include Dry-farmed Agriculture; Dry-farmed Agriculture/Wetland Complex; California Annual Grassland; California Annual Grassland with a Significant Native Component; California Annual Grassland (Disturbed); California Sagebrush Scrub; and Mixed Riparian Woodland (Figure 2). In addition to the land cover types, hydrological features identified on the site include the channels of Sand Creek and its unnamed tributary, as well as potential wetlands occurring in the eastern portion of the site, most of the latter which are included in the area identified as Dry-farmed Agriculture/Wetland Complex.

These land cover types and hydrologic features are described in greater detail below.

2.1.1 Dry-farmed Agriculture

The majority of the site (approximately 79.21 acres) currently supports dry-farmed agriculture currently planted in wheat (*Triticum aestivum*) and is regularly disced. Historic photos of the site indicate that these areas of the site have been in agricultural production at least as far back as 1965 which was the date of the oldest historic aerials, we were able to review for the site. At the time of the May 2021 site visit, the wheat crops were already senescent. Although the senesced wheat crop was relatively dense at a height between approximately 12 and 16 inches, other plant species were found to be growing in amongst the wheat, including but not limited to, field bindweed (*Convolvolus arvensis*), yellow star thistle (*Centaurea solstitialis*), mayweed (*Anthemis cotula*), burclover (*Medicago polymorpha*), black mustard (*Brassica nigra*), common fiddleneck (*Amsinckia menziesii*), and common vetch (*Vicia sativa*).



Project Boundary (96.47 Acres)
Dry-farmed Agriculture (79.21 Acres)
Dry-farmed Agriculture / Wetland Complex (9.26 Acres)
California Annual Grassland (5.36 Acres)
California Annual Grassland with a Significant Native Component (0.80 Acres)
California Annual Grassland (Disturbed) (1.41 Acres)
California Sagebrush Scrub (0.16 Acres)
Mixed Riparian Woodland (0.29 Acres)
Potential Wetland
Sand Creek
Unnamed tributary of Sand Creek
Deer Valley Road
Project Boundary
Project Boundary
1,000'
0
500'
1,000 feet
Approximate Scale
Aerial Photo courtesy of
U.S.D.A. National Agriculture Imagery Program (NAIP) Aerial Photo Field Office 10/2020
Live Oak Associates, Inc.
Albers Ranch
Biotic Habitats / Land Uses
Date 6/09/2021
Project # 2577-01
Figure # 3

Wildlife observed within or flying over this habitat of the site during the May 2021 survey included the red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), Common raven (*Corvus corax*), Say's phoebe (*Sayornis saya*), western meadowlark (*Sturnella neglecta*), western kingbird (*Tyrannus verticalis*), western fence lizard (*Sceloporus occidentalis*), Botta's pocket gopher (*Thomomys bottae*) sign, California ground squirrel (*Otospermophilus beecheyi*), and bobcat (*Lynx rufus*) scat.

2.1.2 Dry-farmed Agriculture/Wetland Complex

A broad swale (approximately 9.26 acres) occurs within the agricultural areas of the site from the site's southeastern corner to the northern boundary near the Sand Creek corridor. Within this large swale, a complex of wetlands appears to be present. Potential wetlands throughout this area were identified based on the presence of cracked soils (a primary hydrology indicator under the U.S. Army Corps of Engineers (USACE) wetland delineation protocol) as well as the presence of some plant species with wetland indicators, including, along with their wetland indicator status, Italian rye-grass (*Festuca perennis*) (FAC), Great Valley gumplant (*Grindelia camporum*) (FACW), alkali heath (*Frankenia salina*) (FACW), and broad-leaf pepperweed (*Lepidium latifolium*) (FAC). More annual wetland species may occur in this area than was able to be identified due to the timing of the survey and the fact that most annual plants had already become senescent and unidentifiable. As will be discussed later in this report, a formal wetland delineation would need to be conducted to determine the extent of wetlands on the study area.

Animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.3 California Annual Grassland

California annual grassland habitat (approximately 5.36 acres) occurs at the edges of the dry-farmed agriculture areas. These areas do not appear to be disturbed by discing activities and are highly dominated by non-native annual grasses and forbs including wild oats (*Avena* sp.), ripgut brome (*Bromus diandrus*), serrated lettuce (*Lactuca serriola*), common fiddleneck, rose clover (*Trifolium hirtum*), and bellardia (*Bellardia trixago*).

The only animal species observed in this habitat was coyote (*Canis latrans*) dens, Botta's pocket gopher sign, and California ground squirrel burrows. Other animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.4 California Annual Grassland with a Significant Native Component

This habitat type was identified along the northern boundary of the site on a north-facing slope (approximately 0.80 acres). It appears that this area may have been temporarily disturbed when a berm was constructed along the outer edge of the Sand Creek riparian corridor along the study area boundary and was likely seeded with a mix of native bunchgrasses and forbs after the berm was constructed. Although this area is mostly dominated by annual species as described above for the California annual grassland habitat, there also was a significant native component present. Native grasses and forbs observed in this location included purple needlegrass (*Stipa pulchra*), creeping wild-rye (*Elymus triticoides*), lupine (*Lupinus* sp.), and California poppy (*Eschscholzia californica*).

Animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.5 California Annual Grassland (Disturbed)

Grasslands that have been significantly disturbed by discing, but don't appear to be part of the dry-farmed areas, occur in the southwestern portion of the site near Deer Valley Road (approximately 1.41 acres). This area supports ruderal vegetation that is adapted to such disturbance, including stinkwort (*Dittrichia graveolens*), black mustard, serrated lettuce and other non-native grasses and forbs previously described as occurring in the California annual grassland habitat.

Animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.6 California Sagebrush Scrub

A small amount of California sagebrush (*Artemisia californica*) scrub habitat (approximately 0.16 acres) occurs on the steep eastern bank of an unnamed tributary of Sand Creek. No other plant species were observed to be associated with the scrub habitat and the understory was mostly barren.

The only animal species observed in this habitat during the May 2021 site visit is the California ground squirrel. Other animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.7 Mixed Riparian Woodland

A small amount of mixed riparian habitat (approximately 0.29 acres) occurs along the southern banks of the unnamed tributary to Sand Creek. Woody riparian vegetation observed in this area included blue oak and valley oak (*Quercus douglasii* and *Q. lobata*), Fremont cottonwood (*Populus fremontii*), poison oak (*Toxicodendron diversilobum*), and almond (*Prunus dulcis*). California annual grassland habitat, as previously described, occurs in the riparian understory.

The only animal species observed in this habitat during the May 2021 site visit is the American kestrel (*Falco sparverius*) and California ground squirrel sign. Other animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.8 Sand Creek, Unnamed Tributary of Sand Creek, and Potential Wetlands

A portion of the Sand Creek channel and an unnamed tributary channel occur in the northwestern portion of the study area. These channels in the northern portion of the site had an approximate width between the tops of the banks of between 30 and 50 feet, and an Ordinary High Water width of approximately six to ten feet. In the western portion of the site, the unnamed tributary channel had an approximate top of bank width of eight to ten feet and OHW width of approximately two to three feet. These channels were completely dry at the time of the May 2021 survey. Vegetation observed within the channels was mostly dominated by broad-leaved pepperweed and black mustard, although wetland vegetation was observed within the channels that were just off site to the north. As indicated above, some woody riparian vegetation was associated with the southern banks of the unnamed tributary.

As described above, a large swale area occurs in the eastern portion of the site which appears to support a complex of small wetlands. Additionally, outside of this area, there were three discrete areas which also are potential wetlands. These three wetlands exhibited similar soils cracks and vegetation as previously described for the potential wetlands within the wetland complex area. A formal wetland delineation would be necessary to determine the extent of these wetlands.

Animal species observed in off-site areas of Sand Creek which have potential to move onto the site include the cliff swallow (*Petrochelidon pyrrhonota*) and red-winged blackbird (*Agelaius phoeniceus*). Other animal species observed in the dryland agriculture are expected to use this habitat as well.

2.2 MOVEMENT CORRIDORS

Landscape linkages are defined as "areas that allow for the movement of species from one area of suitable habitat to another. A linkage can vary from a narrow strip of habitat that only functions as a conduit for movement (i.e., a corridor) or a large area of intact habitat that is used for movement, dispersal, and other life functions such as foraging and breeding". Many wildlife linkages are broad areas of regional movement corridors for wildlife that generally includes a wide swath of land used for movement between two or more core areas for multiple regional species.

Habitat corridors are vital to terrestrial animals for connectivity between core habitat areas (i.e., larger intact habitat areas where species make their living). Connections between two or more core habitat areas help ensure that genetic diversity is maintained, thereby diminishing the probability of inbreeding depression and geographic extinctions.

The quality of habitat within the corridors is important. In general, "better" habitat has less human interference (e.g., roads, homes, etc.) and is more desirable to more species than areas with sparse vegetation and high-density roads. Movement corridors in California are typically associated with valleys, rivers and creeks supporting riparian vegetation, and ridgelines. With increasing encroachment of humans on wildlife habitats, it has become important to establish and maintain linkages, or movement corridors, for animals to be able to access locations containing different biotic resources that are essential to maintaining their life cycles.

Healthy riparian areas (supporting structural diversity, i.e., understory species to saplings to mature riparian trees) not only support a rich and diverse wildlife community but have also been shown to facilitate regional wildlife movement. Riparian areas can vary from tributaries winding through scrubland to densely vegetated riparian forests.

Beier and Loe (1992) noted five functions of corridors (rather than physical traits) that are relevant when conducting an analysis regarding the value of linkages. The following five functions should be used to evaluate the suitability of a given tract of land for use as a habitat corridor:

1. Wide ranging mammals can migrate and find mates;
2. Plants can propagate within the corridor and beyond;
3. Genetic integrity can be maintained;
4. Animals can use the corridor in response to environmental changes or a catastrophic event;
5. Individuals can recolonize areas where local extinctions have occurred.

A corridor is "wide enough" when it meets these functions for the suite of animals in the area. It is important to note that landscape linkages are used differently by different species. For instance, medium to large mammals (or some bird species) may traverse a corridor in a matter of minutes or hours, while smaller mammals or other species may take a longer period of time to move through the same corridor (e.g., measured in days, weeks and even years). For example, an individual cougar may traverse the entire length of a long narrow corridor in an hour while travel of smaller species (such as rodent or rabbit species) may best be measured as gene flow within regional populations. These examples demonstrate that landscape linkages are not simply highways that animals use to move back and forth. While linkages may serve this purpose, they also allow for slower or more infrequent movement. Width and length must be considered in evaluating the value of a landscape linkage. A long narrow corridor would most likely only be useful to wide ranging animals such as cougars and coyotes when moving between core habitat areas.

To the extent practicable, conservation of linkages should address the needs of "passage species" (those species that typically use a corridor for the express purpose of moving from one intact area to another) *and* "corridor dwellers" (slow moving species such as plants and some amphibians and reptiles that require days or generations to move through the corridor).

The project site is under intense agricultural use (i.e., predominantly dry farmed) with Sand Creek running along its northern boundary. Deer Valley Road borders the project site on its west, with Highway 4 occurring about a mile from its eastern boundary. Dense residential development occurs 0.75 miles to the north, 0.6 miles to the southeast and approximately one mile to the east. A development is under construction 0.25 miles to the north. Given that this site sits on the western edge of existing developing in Antioch, movement of wildlife across the broader landscape of the site is somewhat diminished. While birds, rodents and small to medium carnivores are likely to access the site for foraging, some of which would move across the site to forage on similar habitats on immediately adjacent parcels. The most predominate feature on site that would facilitate movement of local wildlife would be Sand Creek.

2.3 SPECIAL STATUS PLANTS AND ANIMALS

Several species of plants and animals within the state of California have low populations, limited distributions, or both. Such species may be considered "rare" and are vulnerable to extirpation as the state's human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described more fully in Section 3.2, state and federal laws have provided the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. A sizable number of native plants and animals have been formally designated as threatened or endangered under state and federal endangered species legislation. Others have been designated as "candidates" for such listing. Still others have been designated as "species of special concern" by the CDFW. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened, or endangered (CNPS 2001). Collectively, these plants and animals are referred to as "special status species."

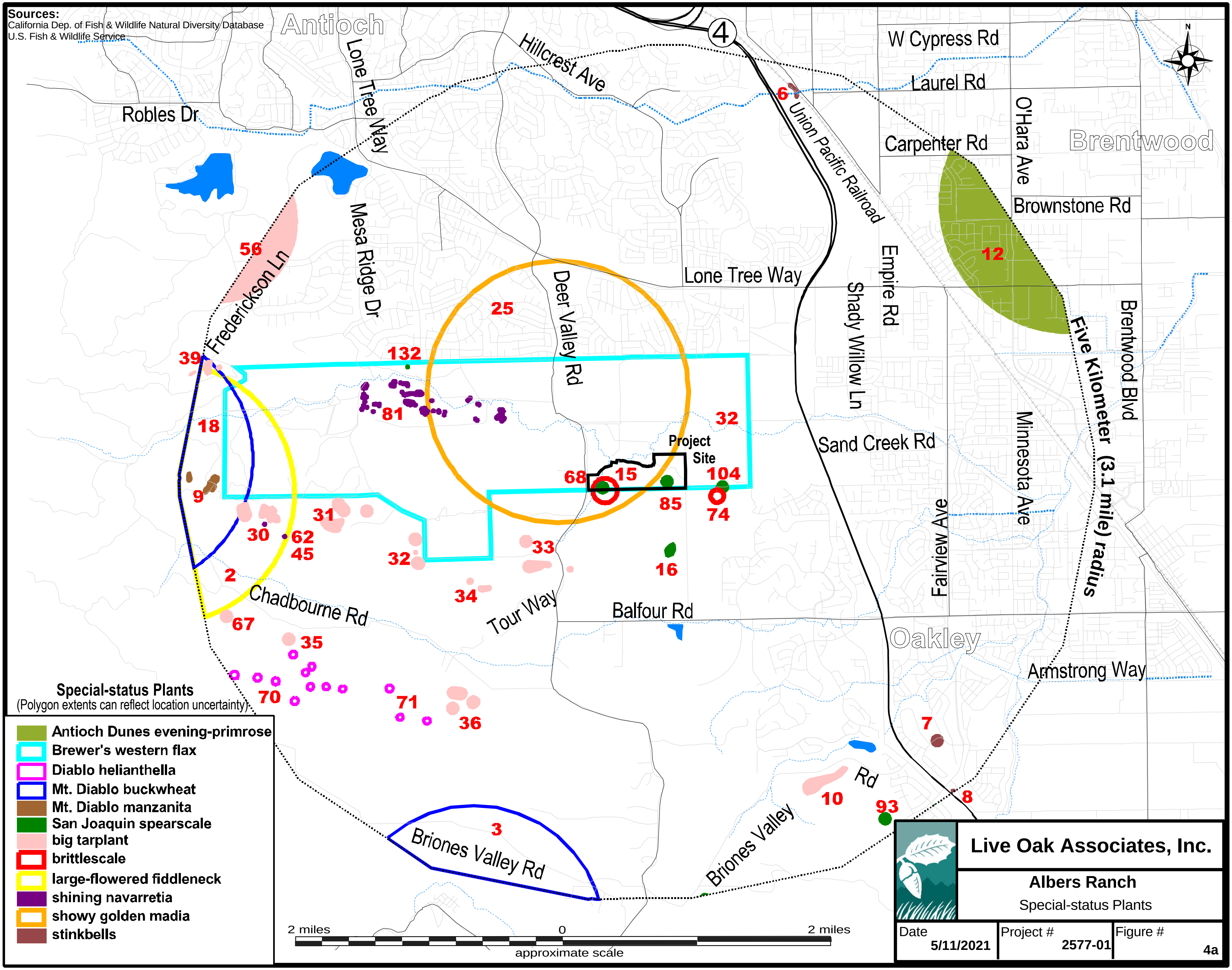
A number of special status plants and animals occur in the vicinity of the project site. These species, and their potential to occur in the project site, are listed in Table 2. Sources of information for this table included *California Natural Diversity Data Base* (CDFW 2021), *Listed Plants* and *Listed Animals* (USFWS 2021), *State and Federally Listed Endangered and Threatened Animals of California* (CDFW 2021), *The California Native Plant Society's Inventory of Rare and Endangered*

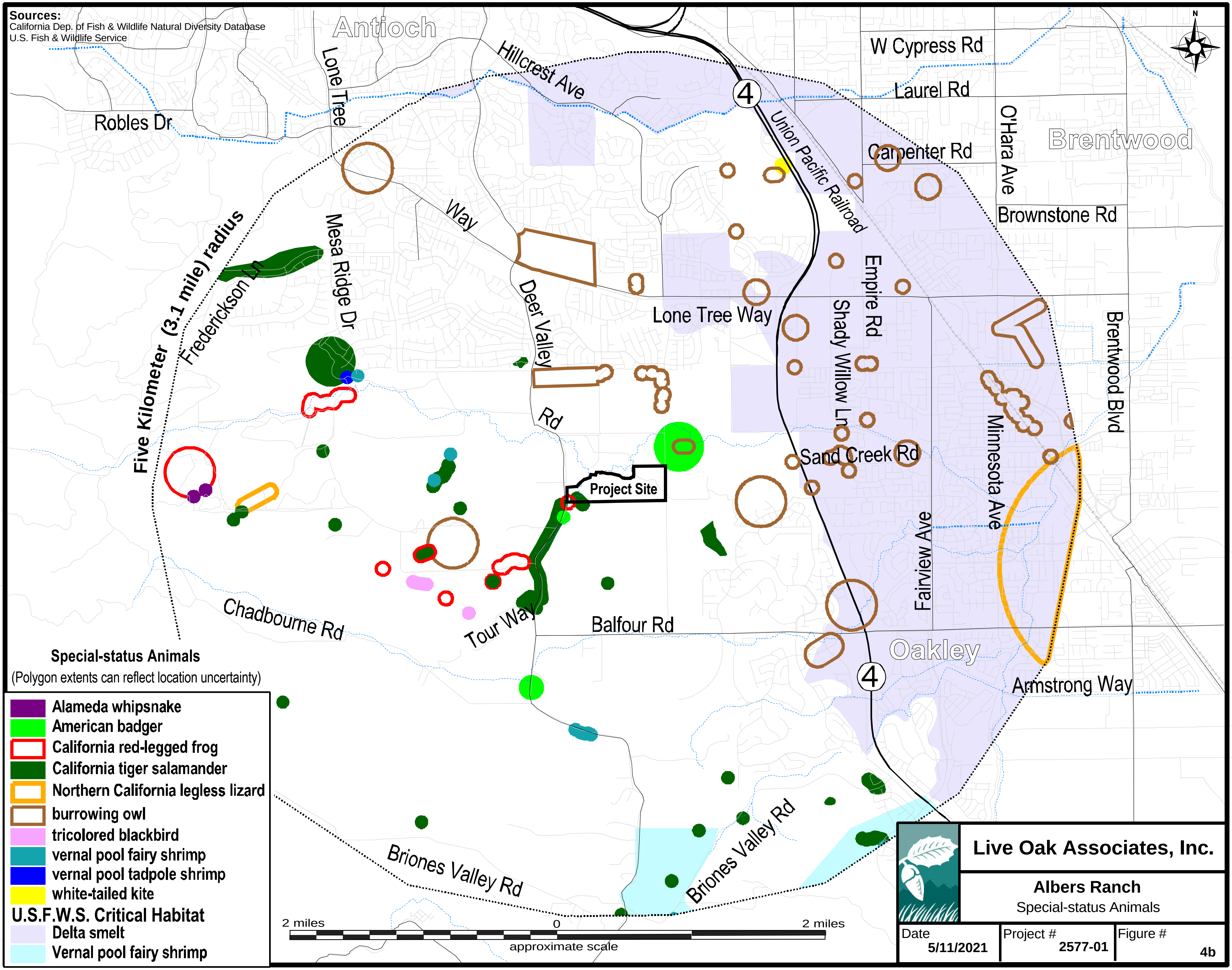
Vascular Plants of California (CNPS 2021), *California Bird Species of Special Concern* (Shuford and Gardall 2008), and *California Amphibian and Reptile Species of Special Concern* (Thompson et al. 2016). This information was used to evaluate the potential for special status plant and animal species that occur on the site. Figures 4a through 4c depict the locations of observations of special status plants and wildlife documented in the California Natural Diversity Data Base (CNDDB).

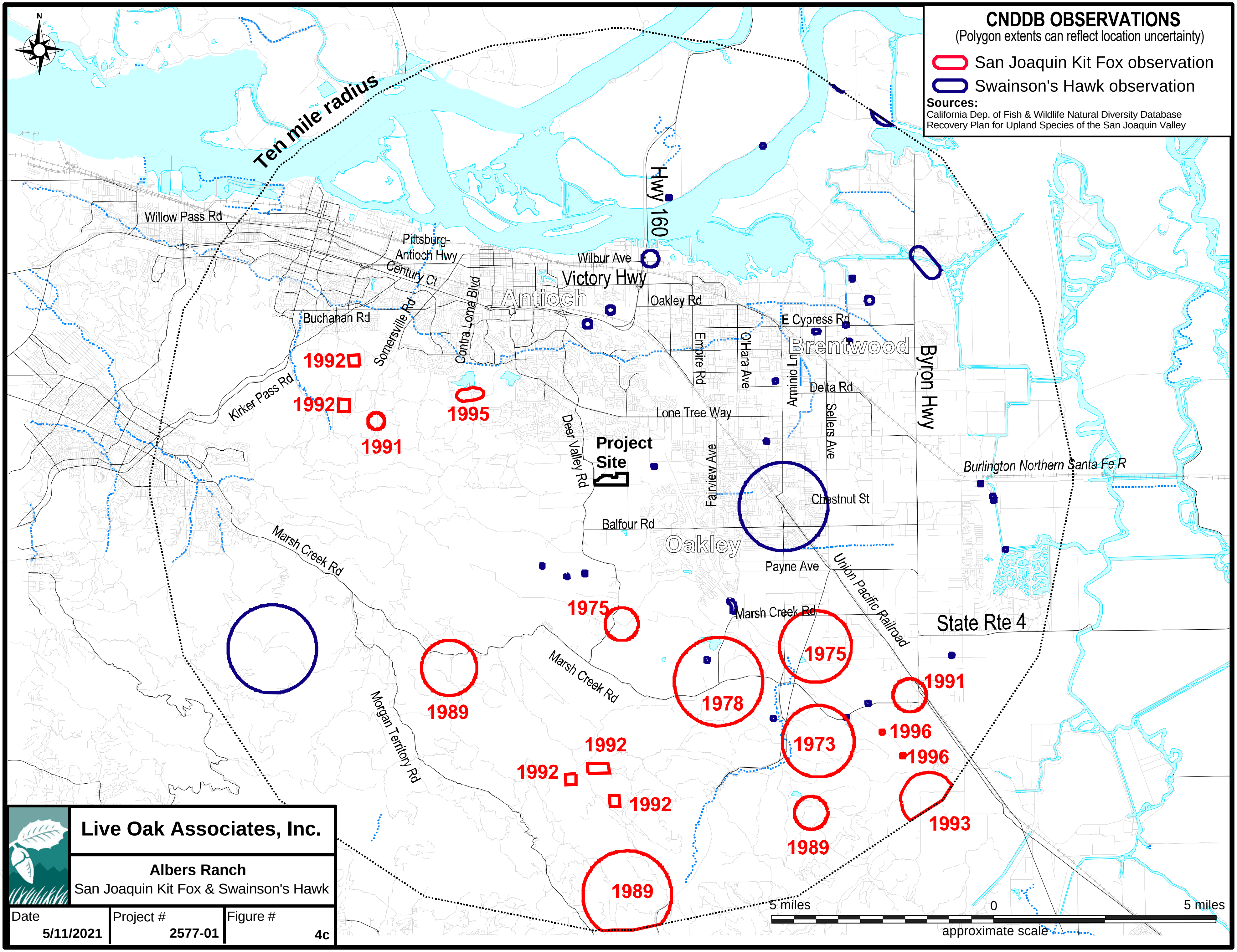
A search of published accounts for all of the relevant special status plant and animal species was conducted for the Antioch South USGS 7.5-minute quadrangle in which the project site occurs, and for the eight surrounding quadrangles (Honker Bay, Antioch North, Jersey Island, Clayton, Brentwood, Diablo, Tassajara, Byron Hot Springs) using the CNDDB Rarefind5. All species listed as occurring in these quadrangles on CNPS Lists 1A, 1B, 2, or 4 were also reviewed (Table 2).

Serpentine soils are absent from the site; as such, those species that are uniquely adapted to serpentine soils in the project's vicinity are considered absent from the site. Several other special status plant species have been ruled out on the site as they occur in habitats not present in the project site (e.g., vernal pool, coastal dunes, coastal scrub, chaparral, broad leafed forest, coastal prairie, cismontane woodland, etc.) or at elevations significantly below or above elevations of the site (approximately 55 to 87 meters NGVD).

Special status plant and animal species having potential to occur on the project site or immediate vicinity because suitable habitats are present are discussed further below.


Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
U.S. Fish & Wildlife Service
Antioch
Brentwood
Oakley
Robles Dr
Lone Tree Way
Hillcrest Ave
4
W Cypress Rd
Laurel Rd
Carpenter Rd
O'Hara Ave
Brownstone Rd
Union Pacific Railroad
Mesa Ridge Dr
Fredrickson Ln
Deer Valley Rd
Lone Tree Way
Shady Willow Ln
Empire Rd
Brentwood Blvd
Five Kilometer (3.1 mile) radius
Sand Creek Rd
Minnesota Ave
Fairview Ave
Project Site
Chadbourne Rd
Tour Way
Balfour Rd
Armstrong Way
Briones Valley Rd
Briones Valley Rd
6
12
56
25
132
39
81
18
32
68
15
104
85
74
9
31
30
62
45
32
33
16
2
34
67
35
70
71
36
7
10
93
8
3
Special-status Plants
(Polygon extents can reflect location uncertainty)
Antioch Dunes evening-primrose
Brewer's western flax
Diablo helianthella
Mt. Diablo buckwheat
Mt. Diablo manzanita
San Joaquin spearscale
big tarplant
brittlescale
large-flowered fiddleneck
shining navarretia
showy golden madia
stinkbells
2 miles
0
2 miles
approximate scale
Live Oak Associates, Inc.
Albers Ranch
Special-status Plants
Date
5/11/2021
Project #
2577-01
Figure #
4a


Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
U.S. Fish & Wildlife Service
Antioch
Brentwood
Oakley
Hillcrest Ave
Lone Tree
Robles Dr
W Cypress Rd
Laurel Rd
Carpenter Rd
O'Hara Ave
Brownstone Rd
Union Pacific Railroad
Way
Mesa Ridge Dr
Fredrickson Ln
Five Kilometer (3.1 mile) radius
Deer Valley Rd
Lone Tree Way
Empire Rd
Shady Willow Ln
Sand Creek Rd
Minnesota Ave
Brentwood Blvd
Fairview Ave
Project Site
Chadbourne Rd
Tour Way
Balfour Rd
Armstrong Way
Briones Valley Rd
Briones Valley Rd
Special-status Animals
(Polygon extents can reflect location uncertainty)
Alameda whipsnake
American badger
California red-legged frog
California tiger salamander
Northern California legless lizard
burrowing owl
tricolored blackbird
vernal pool fairy shrimp
vernal pool tadpole shrimp
white-tailed kite
U.S.F.W.S. Critical Habitat
Delta smelt
Vernal pool fairy shrimp
2 miles
0
2 miles
approximate scale
Live Oak Associates, Inc.
Albers Ranch
Special-status Animals
Date
5/11/2021
Project #
2577-01
Figure #
4b



CNDDB OBSERVATIONS
(Polygon extents can reflect location uncertainty)
San Joaquin Kit Fox observation
Swainson's Hawk observation
Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
Recovery Plan for Upland Species of the San Joaquin Valley
N
Ten mile radius
Willow Pass Rd
Pittsburg-Antioch Hwy
Century Ct
Buchanan Rd
Somersville Rd
Contra Loma Blvd
Antioch
Wilbur Ave
Victory Hwy
Hwy 160
Oakley Rd
E Cypress Rd
Brentwood
Empire Rd
O'Hara Ave
Amino Ln
Delta Rd
Byron Hwy
Kirker Pass Rd
Lone Tree Way
Sellers Ave
Deer Valley Rd
Project Site
Fairview Ave
Burlington Northern Santa Fe R
Chestnut St
Balfour Rd
Oakley
Payne Ave
Union Pacific Railroad
Marsh Creek Rd
State Rte 4
Morgan Territory Rd
1992
1992
1991
1995
1975
1989
1978
1975
1991
1996
1996
1973
1992
1992
1992
1993
1989
1989
5 miles
0
5 miles
approximate scale
Live Oak Associates, Inc.
Albers Ranch
San Joaquin Kit Fox & Swainson's Hawk
Date
5/11/2021
Project #
2577-01
Figure #
4c

TABLE 2. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

PLANTS (adapted from CDFW 2021 and CNPS 2021)

Threatened and Endangered Plants

Species	Status	Habitat	Occurrence in the Project Site
Large-flowered fiddleneck *Amsinckia grandiflora*	FE, CE, CRPR 1B	Habitat: Cismontane woodlands and valley and foothill grasslands. Elevation: 275-550 meters. Blooms: April-May Lifeform: Annual herb	**Unlikely**. Upland habitats of the site have been heavily disturbed by agricultural practices for many decades. The closest known occurrence is approximately 2.5 miles west of the study area and was last observed in 1887 (Occurrence #2).
Contra Costa goldfields *Lasthenia conjugens*	FE, CRPR 1B	Habitat: Alkaline soils in mesic valley and foothill grasslands and vernal pools. Elevation: 0-470 meters. Blooms: March–June Lifeform: Annual herb	**Possible**. Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.

PLANTS (adapted from CDFW 2021 and CNPS 2021)

Other plant species listed by CNPS

Species	Status	Habitat	Occurrence in the Project Site
California androsace *Androsace elongata*	CRPR 4.2	Habitat: Chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper, and valley and foothill grassland. Elevation: 150-1200 meters. Blooms: March–June Lifeform: Annual herb	**Unlikely.** Only very limited and marginal habitat occur within the riparian and scrub habitat of the study area for this species.
Slender silver moss *Anomobryum julaceum*	CRPR 2	Habitat: Damp rock and soil outcrops usually on roadcuts found in broadleafed upland forest, lower montane coniferous forest, and north coast coniferous forest Elevation: 100-1000 meters. Blooming period: N/A Lifeform: Moss	**Absent.** Suitable habitat for this species is absent from the study area.
Mt. Diablo manzanita *Arctostaphylos auriculata*	CRPR 1B	Habitat: Chaparral (sandstone) and cismontane woodland un canyons and on slopes. Elevation: 135-440 meters. Blooming period: January-March Lifeform: Perennial evergreen shrub	**Absent.** No manzanita shrubs were observed on the study area during the May 2021 survey.

Species	Status	Habitat	Occurrence in the Project Site
Contra Costa manzanita *Arctostaphylos manzanita ssp. laevigata*	CRPR 1B	Habitat: Chaparral especially on rocky slopes. Elevation: 430-1410 meters. Blooming period: January-March Lifeform: Perennial evergreen shrub	**Absent.** No manzanita shrubs were observed on the study area during the May 2021 survey.
Alkali milk-vetch *Astragalus tener var. tener*	CRPR 1B	Habitat: Occurs in alkaline soils in valley and foothill grassland and in vernal pools. Elevation: 1-60 meters. Blooms: March-June Lifeform: Annual herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Heartscale *Atriplex cordulata*	CRPR 1B	Habitat: Saline or alkaline soils of chenopod scrub, meadows and seeps, and sandy valley and foothill grassland. Elevation: 0-560 meters. Blooms: April-October Lifeform: Annual herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Brittlescale *Atriplex depressa*	CRPR 1B	Habitat: Alkaline clay soils in chenopod scrub, meadows and seeps, playas, valley and foothill grasslands, and vernal pools. Elevation: 1-320 meters. Blooms: April-October Lifeform: Annual herb;	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Lesser saltscale *Atriplex minuscula*	CRPR 1B	Habitat: Occurs in alkaline and sandy soils in chenopod scrub, playas, and valley and foothill grasslands. Elevation: 15-200 meters Blooms: May-October Lifeform: Annual herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Big tarplant *Blepharizonia plumosa*	CRPR 1B	Habitats: Valley and foothill grassland, usually on clay soil. Elevation: 30-505 meters. Blooms: July-October Lifeform: Annual herb	**Unlikely.** Although there are several occurrences of this species to the west and southwest of the study area, potential habitat for this species would be limited to the small amount of grassland habitat occurring at the edges of the cultivated wheat fields.
Mt. Diablo fairy lantern *Calochortus pulchellus*	CRPR 1B	Habitat: Chaparral, cismontane woodland, riparian woodland, and valley and foothill grasslands. Elevation: 30-840 meters. Blooms: April- June Lifeform: Perennial herb	**Unlikely.** Although there are several occurrences of this species to the west and southwest of the study area, potential habitat for this species would be limited to the small amount of grassland habitat occurring at the edges of the cultivated wheat fields.

Species	Status	Habitat	Occurrence in the Project Site
Congdon's tarplant *Centromadia parryi ssp. congdonii*	CRPR 1B	Habitat: Occurs on valley and foothill grasslands on alkaline soils. Elevation: 0-230 meters. Blooms: May-November Lifeform: Annual herb	**Unlikely.** While alkaline soils are present on the site and while wetlands and grasslands at the edges of the cultivated wheat fields could provide marginal potential habitat for this species, there are no known occurrences within a three-mile radius of the study area.
Hispid salty bird's-beak *Chloropyron molle ssp. hispidum*	CRPR 1B	Habitats: Occurs in alkaline soils in meadows and seeps, playas, and valley and foothill grassland. Elevation: 1-155 meters. Blooms: June-September. Lifeform: Annual herb	**Unlikely.** While wetlands on the site may provide marginally suitable habitat for this species, there are no known occurrences of this species within a three-mile radius of the site.
Hospital Canyon larkspur *Delphinium californicum ssp. interius*	CRPR 1B	Habitats: Chaparral (openings), cismontane woodland (mesic), coastal scrub. Elevation: 195-635 meters Blooms: April-June Lifeform: Perennial herb	**Unlikely.** Habitat is extremely limited on the site for this species, the study area is well below the elevation range for this species, and there are no known occurrences within a three-mile radius of the study area.
Recurved larkspur *Delphinium recurvatum*	CRPR 1B	Habitat: Chenopod scrub, cismontane woodland, and valley and foothill grasslands. Elevation: 3-750 meters. Blooms: March-June. Lifeform: Perennial herb	**Unlikely.** Habitat is extremely limited on the site for this species and there are no known occurrences within a three-mile radius of the study area.
Dwarf downingia *Downingia pusilla*	CRPR 2B	Habitats: Valley and foothills grassland (mesic); vernal pools Elevation: 1-445 meters Blooms: March-May Lifeform: Annual herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Lime Ridge eriastrum *Eriastrum etterae*	CRPR 1B	Habitats: Chaparral (openings or edges) in alkaline or semi alkaline, sandy soils Elevation: 200-655 meters Blooms: June-July Lifeform: Annual herb	**Unlikely.** Habitat is extremely limited on the site for this species, the study area is well below the elevation range for this species, and there are no known occurrences within a three-mile radius of the study area.
Antioch Dunes buckwheat *Eriogonum nudum var. psychicola*	CRPR 1B	Habitats: Inland dunes Elevation: 0-20 meters Blooms: July-October Lifeform: Perennial Herb	**Absent.** Suitable habitat is absent from the study area for this species.
Mt. Diablo buckwheat *Eriogonum truncatum*	CRPR 1B	Habitat: Occurs in chaparral, coastal scrub, and valley and foothill grasslands. Elevation: 3-350 meters. Blooms: April-December Lifeform: Annual herb	**Unlikely.** Habitat is extremely limited on the site for this species, the study area is well below the elevation range for this species, and there are no known occurrences within a three-mile radius of the study area.

Species	Status	Habitat	Occurrence in the Project Site
Jepson's coyote-thistle *Eryngium jepsonii*	CRPR 1B	Habitats: Occurs in valley and foothill grassland and vernal pools. Elevation: 3-300 meters. Blooms: April-August Lifeform: Perennial herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Contra Costa wallflower *Erysimum capitatum var. angustatum*	CRPR 1B	Habitats: Inland Dunes Elevation: 3-20 meters Blooms: March-July Lifeform: Perennial herb	**Absent.** Suitable habitat is absent from the study area for this species.
Diamond-petaled California poppy *Eschscholzia rhombipetala*	CRPR 1B	Habitat: Occurs in valley and foothill grassland with alkali and clay soils. Elevation: 0-975 meters. Blooms: March-April Lifeform: Annual herb.	**Unlikely.** Habitat is extremely limited on the site for this species, the study area is well below the elevation range for this species, and there are no known occurrences within a three-mile radius of the study area.
San Joaquin spearscale *Extriplex joaquinana*	CRPR 1B	Habitat: Occurs in chenopod scrub, meadows and seeps, playas, and valley and foothill grasslands on alkaline soils. Elevation: 1-835 meters. Blooms: April-October Lifeform: Annual herb	**Possible**. This species was documented on the site on both banks of the unnamed tributary in the western portion of the site in 1989 (Occurrence #15) and in 2005 one plant was observed near the southeastern boundary of the study area (Occurrence #85). Alkaline wetlands and also alkaline grasslands at the edges of the cultivated wheat fields provide potential habitat for this species.
Stinkbells *Fritillaria agrestis*	CRPR 4.2	Habitats: Occurs in chaparral, valley grassland, foothill woodland, wetland, and riparian habitats, and can be associated with serpentine soils. Elevation: 10-1555 meters. Blooms: Mar-Jun Lifeform: Perennial herb	**Unlikely.** Habitats of the study area are extremely marginal for this species and serpentine soils are absent. The closest documented occurrence is almost three miles west of the site (Occurrence #9).
Toren's grimmia *Grimmia torenii*	CRPR IB	Habitats: Occurs in openings, rock outcrops, boulders, rock walls, carbonate, and volcanic areas in chaparral, cismontane woodland, and lower montane coniferous forests Elevation: 325-1160 meters Blooms: N/A Lifeform: Moss	**Absent.** Suitable habitat is absent from the study area for this species.
Diablo helianthella *Helianthella castanea*	CRPR 1B	Habitat: Occurs in cismontane woodland, coastal scrub, chaparral, riparian woodland and broadleaved upland forest. Elevation: 60-1300 meters. Blooms: March-June Lifeform: Perennial herb	**Absent.** This perennial species would have been observed if present during the May 2021 survey and it was not observed.

Species	Status	Habitat	Occurrence in the Project Site
Brewer's western flax *Hesperolinon breweri*	CRPR 1B	Habitat: Usually occurs on serpentine soils of chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 30-900 meters. Blooms: May–July. Lifeform: Annual herb	**Absent.** Serpentine soils are absent from the site.
Showy golden madia *Madia radiata*	CRPAR 1B	Habitat: Cismontane woodland; valley and foothill grassland Elevation: 25-1215 meters Blooms: March-May Lifeform: Annual herb	**Unlikely.** Habitats of the study area are extremely marginal for this species and limited to the small amount of undisturbed grasslands at the margins of the wheat fields.
Hall's bush-mallow *Malcothamnus hallii*	CRPR 1B	Habitat: Chaparral and coastal scrub Elevation: 10-760 meters Blooms: April-October Lifeform: Perennial evergreen shrub	**Absent.** This perennial shrub would have been identifiable if present during the May 2021 survey and it was not observed.
Lime Ridge navarretia *Navarretia gowenii*	CRPR 1B	Habitat: Chaparral Elevation: 108-305 meters Blooms: May-June Lifeform: Annual herb	**Absent.** Suitable habitat is absent from the study area for this species.
Shining navarretia *Navarretia nigelliformis ssp. radians*	CRPR 1B	Habitat: Occurs in cismontane woodlands, valley and foothill grasslands, and vernal pools. Elevation: 76-1000 meters. Blooms: April-July Lifeform: Annual herb;	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Antioch Dunes evening-primrose *Oenothera deltoides spp. howellii*	CRPR 1B	Habitat: Inland dunes Elevation: 0-30 meters Blooms: March-September Lifeform: Perennial herb	**Absent.** Suitable habitat is absent from the study area for this species.
Mt. Diablo phacelia *Phacelia phaceliodes*	CRPR 1B	Habitat: Chaparral and cismontane woodland; rocky soils Elevation: 500-1370 meters Blooms: April-May Lifeform: Annual herb	**Absent.** Suitable habitat is absent from the study area for this species.
Bearded popcornflower *Plagiobothrys hystriculus*	CRPR 1B	Habitat: Often in vernal swales. Also found in vernal pool margins and in mesic valley and foothill grassland Elevation: 0-274 meters Blooms: April-May Lifeform: Annual herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
California alkali grass *Puccinellia simplex*	CRPR 1B	Habitat: Occurs in alkaline, vernally mesic, sinks, flats, and lake margins within chenopod scrub, meadows and seeps, valley and foothill grasslands, and vernal pools. Elevation:2-930 meters. Blooms: March-May Lifeform: Annual grass	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.

Species	Status	Habitat	Occurrence in the Project Site
Rock sanicle *Sanicula saxatalis*	CRPR 1B	Habitat: Rocky, scree, and talus in broadleaved upland forest, chaparral, and valley and foothill grassland Elevation: 620-1175 meters Blooms: April-May Lifeform: Perennial herb	**Absent**. No suitable habitat occurs in the study area for this species.
Chaparral ragwort *Senecio aphanactis*	CRPR 2B	Habitat: Sometimes in alkaline soils; chaparral, cismontane woodland and coastal scrub Elevation: 15-800 meters Blooms: January-May Lifeform: Annual herb	**Absent**. No suitable habitat occurs in the study area for this species.
Long-styled sand-spurrey *Spergularia macrotheca var. longistyla*	CRPR 1B	Habitat: Occurs in alkaline meadows and seeps and marshes and swamps. Elevation: 0-255 meters. Blooms: February-May Lifeform: Perennial herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Keck's checkerbloom *Sidalcea keckii*	CRPR 1B	Habitat: Serpentinite and clay soils in cismontane woodland and valley and foothill grassland Elevation: 75-650 meters Blooms: April-June Lifeform: Annual herb	**Absent**. No suitable habitat occurs in the study area for this species.
Mt. Diablo jewel-flower *Streptanthus hispidus*	CRPR 1B	Habitat: Occurs in rocky areas of chaparral and valley and foothill grasslands. Elevation: 365-1200 meters. Blooms: March-June Lifeform: Annual herb;	**Absent**. No suitable habitat occurs in the study area for this species.
Coastal triquetrella *Triquetrella californica*	CRPR 1B	Habitat: Coastal bluff scrub and coastal scrub Elevation: 10-100 meters Blooms: N/A Lifeform: Moss	**Absent**. No suitable habitat occurs in the study area for this species.
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	CRPR 1A	Habitat: Occurs in alkaline soils of valley and foothill grassland. Elevation: 1-455 meters. Blooms: March-April Lifeform: Annual herb	**Unlikely.** Habitats of the study area are extremely marginal for this species and limited to the small amount of undisturbed grasslands at the margins of the wheat fields. Additionally, this species was last observed in the region in the late 1800's and early 1900's.
Oval-leaved Viburnum *Viburnum ellipticum*	CRPR 2B	Habitat: Chaparral, cismontane woodland, and lower montane coniferous forest Elevation: 215-1400 meters Blooms: May-June Lifeform: Perennial deciduous shrub	**Absent**. No suitable habitat occurs in the study area for this species.

ANIMALS (Continued adapted from CDFW 2021 and USFWS 2021)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat	Occurrence in the Project Site
Lange's metalmark butterfly *Apodemia mormo langei*	FE	Occurs in riverbank sand dunes supporting its host plant Eriogonum nudum var. auriculatum.	**Absent.** The site does not support suitable habitat for this species additionally, the hose plant was not observed during the 2021 site visit. This species occurs on the Antioch Dunes.
Conservancy fairy shrimp *Branchinecta conservatio*	FE	Occurs in large, deep vernal pools and lakes of California with water into June at elevations from 5 to 145 meters.	**Unlikely.** Although a seasonal wetland complex in the eastern portion of the site is potentially capable of supporting vernal pool branchiopods, this species has not been documented in Contra Costa County. The nearest documented occurrence of this species is more than eight miles north of the site in Solano County.
Longhorn fairy shrimp *Branchinecta longiantenna*	FE	Occurs in ephemeral wetlands and vernal pools of California.	**Unlikely.** Although a seasonal wetland complex in the eastern portion of the site is potentially capable of supporting vernal pool branchiopods, the site occurs several miles beyond the northern end of this species' range.
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	Occurs in vernal pools of California.	**Possible.** A seasonal wetland complex in the eastern portion of the site is potentially capable of supporting vernal pool branchiopods. This species is known to occur in the region, with the nearest documented observation located approximately one mile west of the site.
Vernal pool tadpole shrimp *Lepidurus packardi*	FE	Occurs in vernal pools of California. Vernal pools and swales in the Sacramento Valley containing clear to highly turbid water.	**Possible.** A seasonal wetland complex in the eastern portion of the site is potentially capable of supporting vernal pool branchiopods. This species is known to occur in the region, with the nearest documented observation located approximately two miles northwest of the site.
Steelhead - Central Valley DPS *Oncorhynchus mykiss irideus*	FT	Spawn in freshwater rivers or streams in the spring and spend the remainder of their life in the ocean.	**Absent.** Steelhead are not known to occur within this reach of Sand Creek. Additionally, there is no recorded occurrences within three miles of the site.
Longfin smelt *Spirinchus thaleichthys*	CT, CSC	Anadromous. In California, occurs in Sacramento-San Joaquin estuary and one record from Monterey Bay. Spawns in sandy to gravely substrates near the ocean November to June; some populations are landlocked.	**Absent.** Longfin smelt are not known to occur within this reach of Sand Creek. Additionally, there is no recorded occurrences within three miles of the site.

Species	Status	Habitat	Occurrence in the Project Site
California tiger salamander (CTS) *Ambystoma californiense*	FT/CT	Breeds in vernal pools and stock ponds of central California; adults aestivate in grassland habitats adjacent to the breeding sites.	**Possible.** CTS are known to previously occur within the tributary of Sand Creek at the southwestern corner of the site.
Foothill yellow-legged frog (FYLF) *Rana boylii*	CE/CSC	Occurs in swiftly flowing streams and rivers with rocky substrate with open, sunny banks in forest, chaparral, and woodland habitats, and can sometimes be found in isolated pools.	**Absent.** Habitat onsite is not suitable for the FYLF, additionally, FYLF are not known to occur within three miles of the site.
California red-legged frog (CRLF) *Rana aurora draytonii*	FT/CSC	Rivers, creeks and stock ponds of the Sierra foothills and Bay Area, preferring pools with overhanging vegetation.	**Possible.** CRLF are known to previously occur within the tributary of Sand Creek at the southwestern corner of the site.
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT, CT	Occurs in chaparral foothills, shrublands with scattered grass patches, rocky canyons, and watercourses. Occurs in the San Francisco Bay area including Alameda, Contra Costa, Santa Clara and San Joaquin Counties, CA.	**Absent.** Suitable habitat for this species is absent from the site.
San Joaquin whipsnake *Masticophis flagellum ruddocki*	CSC	Open, dry habitats with little or no tree cover. Found in valley grasslands and saltbush scrub in the San Joaquin Valley.	**Absent.** The site is not within the range of the San Joaquin whipsnake.
Giant garter snake *Thamnophis gigas*	FT, CT	Habitat requirements consist of (1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; (3) grassy banks and openings in waterside vegetation for basking; and (4) higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter.	**Absent.** The site is not within the range of the giant garter snake.
American peregrine falcon *Falco peregrines anatum*	CP	Individuals breed on cliffs in the Sierra or in coastal habitats; occurs in many habitats of the state during migration and winter.	**Absent.** Suitable habitat for this species is absent from the site and this species is not known to occur within three miles of the site.

Species	Status	Habitat	Occurrence in the Project Site
California least tern *Sterna antillarum browni*	FE, CE, CP	Occurs in central to southern California April to November. Found in and near coastal habitat including coasts, beaches, bays, estuaries, lagoons, lakes, and rivers.	**Absent.** Although this species may fly over the site during migration, suitable foraging and breeding habitat are absent from the site.
Bank swallow *Riparia riparia*	CT	Occurs in open areas near flowing water, nests in steep banks along inland water or coast. State-wide.	**Absent.** Suitable habitat for this species is absent from the site.
Tricolored blackbird *Agelaius tricolor*	CSC/ CT	Breeds near fresh water in dense emergent vegetation.	**Unlikely.** Although suitable nesting habitat appears to be present within the wetland area of Sand Creek to the north of the site, this species is unlikely to nest on the site itself. The nearest documented observation of this species is more than a mile from the site.
Swainson's hawk (SWHA) *Buteo swainsoni*	CT	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands or alfalfa fields supporting rodent populations.	**Possible.** Trees along the margins of the site are potentially suitable for SWHA nesting and the remainder of the site is suitable foraging habitat for this species. There have been 30 documented sightings within a ten-mile radius of the project site (Figure 4c) with the closest being within a quarter mile of the site. Therefore, Swainson's hawks may occur onsite.
San Joaquin kit fox *Vulpes macrotis mutica*	FE, CT	Frequents desert alkali scrub and annual grasslands and may forage in adjacent agricultural habitats. Utilizes enlarged (4 to 10 inches in diameter) ground squirrel burrows as denning habitat.	**Unlikely.** No San Joaquin kit fox burrows were observed on the site during the field survey in 2021, but an extensive burrow survey was not conducted. There were 18 documented sightings within a ten-mile radius of the project site with records ranging from 1973-1996 (Figure 4c). Thus, there has not been any record of kit fox within the Sand Creek area for more than 25 years. The site has been highly modified for agricultural use and, as a result, provides only marginal foraging and dispersal habitat for the kit fox.

ANIMALS (adapted from CDFW 2021 and USFWS 2021)

State Species of Special Concern and Protected Species

Species	Status	Habitat	Occurrence in the Project Site
Sacramento perch *Archoplites interruptus*	CSC	Occurs in sloughs, slow-moving rivers, and large lakes. They are not known from their historic range, and most known locations are locations where this species has been planted. Less than 25 populations are known (CDFW species accounts).	**Absent.** Sacramento perch are not known to occur within this reach of Sand Creek. Additionally, there is no recorded occurrences within three miles of the site.

Species	Status	Habitat	Occurrence in the Project Site
California glossy snake *Arizona elegans occidentallis*	CSC	Occurs in arid areas with grassland, scrub, chaparral, and rocky washes. This species is nocturnal and spends the day in burrows.	**Absent.** Habitats required by this species is absent from the site. Additionally, the nearest recorded observation of this species is more than three miles from the site.
Northern California legless lizard *Anniella pulchra*	CSC	The NCLL (previously called black legless lizard) occurs mostly underground in warm moist areas with loose soil and substrate. The NCLL occurs in habitats including sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks.	**Absent.** Habitats required by northern California legless lizards are absent from the site, as the site lacks sandy soils. Additionally, the nearest documented observation of this species is approximately 2.5 miles from the site.
Coast horned lizard *Phrynosoma blainvillii*	CSC	Occurs in grasslands, scrublands, oak woodlands, etc. of central California. Common in sandy washes with scattered shrubs.	**Unlikely.** Habitats required by coast horned lizards are only marginally suitable, as the site lacks sandy soils. The nearest documented observation of this species is approximately two miles to the south of the site.
Western pond turtle (WPT) *Actinemys marmorata*	CSC	Intermittent and permanent waterways including streams, marshes, rivers, ponds and lakes. Open slow-moving water of rivers and creeks of central California with rocks and logs for basking.	**Possible.** Sand Creek and the tributary of Sand Creek occurring on the site does not support water year-round, however it appears wetlands exist adjacent to the site, therefore, WPT could move onto the site from time to time, especially during wet periods. The nearest recorded observation of this species is more than three miles from the site.
White-tailed kite (WTK) *Elanus leucurus*	CP	Open grasslands and agricultural areas throughout central California.	**Possible.** Trees along the margins of the site provide potentially suitable nesting habitat and the remainder of the site is suitable foraging habitat for the WTK. The nearest recorded observation of this species is approximately 2.5 miles from the site.
Northern harrier *Circus cyaneus*	CSC	Frequents meadows, grasslands, open rangelands, freshwater emergent wetlands; uncommon in wooded habitats.	**Possible.** Suitable habitat for this species occurs onsite.
Golden eagle (GE) *Aquila chrysaetos*	CP	Typically frequents rolling foothills, mountain areas, sage-juniper flats and desert.	**Possible.** Although suitable breeding habitat for the golden eagle is absent from the site, foraging habitat exists onsite. The nearest documented occurrence of the GE is more than three miles from the site.

Species	Status	Habitat	Occurrence in the Project Site
Burrowing owl (BUOW) *Athene cunicularia*	CSC	Found in open, dry grasslands, deserts and ruderal areas. Requires suitable burrows. This species is often associated with California ground squirrels.	**Possible.** Suitable habitat is present onsite and adjacent to the site in the form of ground squirrel burrows. The nearest documented occurrence of BUOW is within a quarter mile from the site.
Short-eared owl *Asio flammeus*	CSC	Occur in wide open spaces including marshes, open shrublands, grassland, prairie, and agricultural field habitats, and need dense ground cover to conceal nests.	**Possible.** Suitable habitat for short-eared owls occurs on the site. However, they have not been recorded within three miles of the site.
Loggerhead shrike (LOSH) *Lanius ludovicianus*	CSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. Nests in tall shrubs and dense trees. Forages in grasslands, marshes, and ruderal habitats. Can often be found in cropland.	**Possible.** Suitable breeding and foraging habitat exist along the margins of the site in the form of shrubs.
Yellow-breasted chat (YBC) *Icteria virens*	CSC	Frequently breeds in dense shrubs and blackberry thickets and uses areas of dense vegetation during migration.	**Unlikely.** Although dense vegetation suitable for nesting occurs nearly adjacent to the site, it is absent from the site, therefore, although this species may occur within the local vicinity, it is unlikely to occur onsite.
California yellow warbler *Dendroica petechia brewsteri*	CSC	Migrants move through many habitats of Sierra and its foothills. This species breeds in riparian thickets of alder, willow and cottonwoods.	**Unlikely.** Although dense vegetation suitable for nesting occurs nearly adjacent to the site, it is absent from the site, therefore, although this species may occur within the local vicinity, it is unlikely to occur onsite.
Grasshopper sparrow *Ammodramus savannarum*	CSC	Occurs in California during spring and summer in open grasslands with scattered shrubs.	**Possible.** Suitable breeding habitat is marginal onsite. The nearest documented occurrence is more than three miles from the site.
Townsend's big-eared bat *Corynorhinus townsendii*	CSC	Primarily a cave-dwelling bat that may also roost in buildings. Occurs in a variety of habitats.	**Possible.** Although suitable foraging habitat occurs onsite, suitable roosting habitat is absent from the site.
Pallid bat *Antrozous pallidus*	CSC	Grasslands, chaparral, woodlands, and forests; most common in dry rocky open areas providing roosting opportunities.	**Possible.** Although suitable foraging habitat occurs onsite, suitable roosting habitat is absent from the site.
Western red bat *Lasiurus blossevillii*	CSC	Roosts in tree or shrub foliage, although will occasionally use caves.	**Possible.** Trees with foliage thick enough for roosting western red bats is absent from the site, however, this species may be expected to forage over the site.
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	CSC	Found in hardwood forests, oak riparian and shrub habitats.	**Absent.** Woodrat nests were not observed during the 2021 survey.

Species	Status	Habitat	Occurrence in the Project Site
American badger *Taxidea taxus*	CSC	Found in drier open stages of most shrub, forest and herbaceous habitats with friable soils, specifically grassland environments. Natal dens occur on slopes.	**Possible.** Suitable habitat for badgers occurs on the site and in the vicinity of the site. The nearest recorded observation of this species is adjacent to the site.

*Explanation of Occurrence Designations and Status Codes
Present: Species observed on the site at time of field surveys or during recent past.
Likely: Species not observed on the site, but it may reasonably be expected to occur there on a regular basis.
Possible: Species not observed on the site, but it could occur there from time to time.
Unlikely: Species not observed on the site, and would not be expected to occur there except, perhaps, as a transient.
Absent: Species not observed on the site, and precluded from occurring there because habitat requirements not met.

STATUS CODES

FE	Federally Endangered	CE	California Endangered
FT	Federally Threatened	CT	California Threatened
FPE	Federally Endangered (Proposed)	CR	California Rare
FC	Federal Candidate	CP	California Protected
CSC	California Species of Special Concern		
		CCE	California Candidate Endangered
CNPS	California Native Plant Society Listing		
1A	Plants Presumed Extinct in California	3	Plants about which we need more information – a review list
1B	Plants Rare, Threatened, or Endangered in California and elsewhere	4	Plants of limited distribution – a watch list
2	Plants Rare, Threatened, or Endangered in California, but more common elsewhere		

2.4 JURISDICTIONAL WATERS

Jurisdictional waters include rivers, creeks, and drainages that have a defined bed and bank and which, at the very least, carry ephemeral flows. Jurisdictional waters also include lakes, ponds, reservoirs, and wetlands. Such waters may be subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE), CDFW, and the Regional Water Quality Control Board (RWQCB). See Section 3.2.5 of this report for additional information. A portion of Sand Creek and a tributary of Sand Creek exist in the western portion of the site. In addition to the channels, a fairly extensive wetland complex is present at the lower elevations of the eastern portion of the site in an area proposed for development, and there are also three potential wetlands occurring outside of the wetland complex. See Section 3.3.14 of this report for a more detailed discussion.

3 IMPACTS AND MITIGATIONS

3.1 SIGNIFICANCE CRITERIA

General plans, area plans, and specific projects are subject to the provisions of the California Environmental Quality Act. The purpose of CEQA is to assess the impacts of proposed projects on the environment before they are constructed. For example, site development may require the removal of some or all of its existing vegetation. Animals associated with this vegetation could be destroyed or displaced. Animals adapted to humans, roads, buildings, pets, etc., may replace those species formerly occurring on a site. Plants and animals that are state and/or federally listed as threatened or endangered may be destroyed or displaced. Sensitive habitats such as wetlands and riparian woodlands may be altered or destroyed. These impacts may be considered significant. According to *2019 CEQA Status and Guidelines* (2019), "Significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest. Specific project impacts to biological resources may be considered "significant" if they will:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

3.2 RELEVANT GOALS, POLICIES, AND LAWS

3.2.1 Threatened and Endangered Species

State and federal “endangered species” legislation has provided the CDFW and USFWS with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Species listed as threatened or endangered under provisions of the state and federal Endangered Species Acts, candidate species for such listing, state species of special concern, and some plants listed as endangered by the California Native Plant Society are collectively referred to as “species of special status.” Permits may be required from both the CDFW and USFWS if activities associated with a proposed project will result in the take of a listed species. To “take” a listed species, as defined by the state of California, is “to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill” said species (California Fish and Game Code, Section 86). “Take” is more broadly defined by the federal Endangered Species Act to include “harm” of a listed species (16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, the CDFW and the USFWS are responding agencies under CEQA. Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

3.2.2 Migratory Birds

State and federal laws also protect most bird species. The State of California signed Assembly Bill 454 into law in 2019, which clarifies native bird protection and increases protections where California law previously deferred to Federal law. The Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., scc. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

3.2.3 Birds of Prey

Birds of prey are protected in California under provisions of the State Fish and Game Code, Section 3503.5, which states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFW.

Additionally, the Bald and Golden Eagle Protection Act (16 U.S.C., scc. 668-668c) prohibits anyone from taking bald or golden eagles, including their parts, nests, or eggs, unless authorized under a federal permit. The act prohibits any disturbance that directly affects an eagle or an active eagle nest as well as any disturbance caused by humans around a previously used nest site during a time when eagles are not present such that it agitates or bothers an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

3.2.4 Bats

Section 2000 and 4150 of the California Fish and Game Code states that it is unlawful to take or possess a number of species, including bats, without a license or permit, as required by Section 3007. Additionally, Title 14 of the California Code of Regulations states it is unlawful to harass, herd, or drive a number of species, including bats. To harass is defined as "an intentional act which disrupts an animal's normal behavior patterns, which includes, but is not limited to, breeding, feeding or sheltering." For these reasons, bat colonies in particular are considered to be sensitive and therefore, disturbances that cause harm to bat colonies are unlawful.

3.2.5 Wetlands and Other "Jurisdictional Waters"

Jurisdictional waters include waters of the United States subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE) and waters of the State of California subject to the regulatory authority of the California Department of Fish and Wildlife (CDFW) and the California Regional Water Quality Control Board (RWQCB).

Clean Water Act, Section 404. The USACE regulates the filling or grading of Waters of the U.S. under the authority of Section 404 of the Clean Water Act. Drainage channels and adjacent wetlands may be considered "waters of the United States" or "jurisdictional waters" subject to the jurisdiction of the USACE. The extent of jurisdiction has been defined in the Code of Federal Regulations and clarified in federal courts.

The definition of waters of the U.S. have changed several times in recent years. In January 2020, the Environmental Protection Agency (EPA) and USACE jointly issued the Navigable Waters Protection Rule. The new rule was published in the Federal Register on April 21, 2020, and took effect on June 22, 2020.

The Navigable Waters Protection Rule (33 CFR §328.3(a)) defines waters of the U.S. as:

Territorial Seas and Traditional Navigable Waters (TNWs)

- The territorial seas and traditional navigable waters include large rivers and lakes and tidally influenced waterbodies used in interstate or foreign commerce.

Tributaries

- Tributaries include perennial and intermittent rivers and streams that contribute surface flow to traditional navigable waters in a typical year. These naturally occurring surface water channels must flow more often than just after a single precipitation event—that is, tributaries must be perennial or intermittent.
- Tributaries can connect to a traditional navigable water or territorial sea in a typical year either directly or through other "waters of the United States," through channelized non-jurisdictional surface waters, through artificial features (including culverts and spillways), or through natural features (including debris piles and boulder fields).
- Ditches are to be considered tributaries only where they satisfy the flow conditions of the perennial and intermittent tributary definition and either were constructed in or relocate a tributary or were constructed in an adjacent wetland and contribute perennial or intermittent flow to a traditional navigable water in a typical year.

Lakes, Ponds, and Impoundments of Jurisdictional Waters

- Lakes, ponds, and impoundments of jurisdictional waters are jurisdictional where they contribute surface water flow to a traditional navigable water or territorial sea in a typical year either directly or through other waters of the United States, through channelized non-jurisdictional surface waters, through artificial features (including culverts and spillways), or through natural features (including debris piles and boulder fields).

- Lakes, ponds, and impoundments of jurisdictional waters are also jurisdictional where they are flooded by a water of the United States in a typical year, such as certain oxbow lakes that lie along the Mississippi River.

Adjacent Wetlands

- Wetlands that physically touch other jurisdictional waters are "adjacent wetlands."

- Wetlands separated from a water of the United States by only a natural berm, bank or dune are also "adjacent."

- Wetlands inundated by flooding from a water of the United States in a typical year are "adjacent."

- Wetlands that are physically separated from a jurisdictional water by an artificial dike, barrier, or similar artificial structure are "adjacent" so long as that structure allows for a direct hydrologic surface connection between the wetlands and the jurisdictional water in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature.

- An adjacent wetland is jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

The Navigable Waters Protection Rule also outlines what do not constitute waters of the United States. The following waters/features are not jurisdictional under the rule:

- Waterbodies that are not included in the four categories of waters of the United States listed above.

- Groundwater, including groundwater drained through subsurface drainage systems, such as drains in agricultural lands.

- Ephemeral features, including ephemeral streams, swales, gullies, rills, and pools.

- Diffuse stormwater run-off and directional sheet flow over upland.

- Many farm and roadside ditches.

- Prior converted cropland retains its longstanding exclusion, but is defined for the first time in the final rule. The agencies are clarifying that this exclusion will cease to apply when cropland is abandoned (i.e., not used for, or in support of, agricultural purposes in the immediately preceding five years) and has reverted to wetlands.

- Artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease.

- Artificial lakes and ponds, including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters.

- Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel.

- Stormwater control features excavated or constructed in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater run-off.

- Groundwater recharge, water reuse, and wastewater recycling structures, including detention, retention and infiltration basins and ponds, that are constructed in upland or in non-jurisdictional waters.

- Waste treatment systems have been excluded from the definition of waters of the United States since 1979 and will continue to be excluded under the final rule. Waste treatment systems include all components, including lagoons and treatment ponds (such as settling or cooling ponds), designed to either convey or retain, concentrate, settle, reduce, or remove pollutants, either actively or passively, from wastewater or stormwater prior to discharge (or eliminating any such discharge).

All activities that involve the discharge of dredge or fill material into waters of the U.S. are subject to the permit requirements of the USACE under Section 404 of the Clean Water Act. Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued without a CWA Section 401 Water Quality Certification (or waiver of such certification) verifying that the proposed activity will meet state water quality standards (Section 3.6.2).

Porter-Cologne Water Quality Act/Clean Water Act, Section 401. There are nine Regional Water Quality Control Boards statewide; collectively, they oversee regional and local water quality in California. The RWQCB administers Section 401 of the Clean Water Act and the Porter-Cologne

Water Quality Control Act. The RWQCB for a given region regulates discharges of fill or pollutants into waters of the State through the issuance of various permits and orders.

Pursuant to Section 401 of the Clean Water Act, the RWQCB regulates waters of the State that are also waters of the U.S. Discharges into such waters require a Section 401 Water Quality Certification from the RWQCB as a condition to obtaining certain federal permits, such as a Clean Water Act Section 404 permit (Section 3.6.1). Discharges into all Waters of the State, even those that are not also Waters of the U.S., require Waste Discharge Requirements (WDRs), or a waiver of WDRs, from the RWQCB.

The Porter-Cologne Water Quality Control Act, Water Code Section 13260, requires that "any person discharging waste, or proposing to discharge waste, within any region that could affect the 'waters of the State' to file a report of discharge" with the RWQCB. Waters of the State as defined in the Porter-Cologne Act (Water Code Section 13050[e]) are "any surface water or groundwater, including saline waters, within the boundaries of the state." This gives the RWQCB authority to regulate a broader set of waters than the Clean Water Act alone; specifically, in addition to regulating waters of the U.S. through the Section 401 Water Quality Certification process, the RWQCB also claims jurisdiction and exercises discretionary authority over "isolated waters," or waters that are not themselves waters of the U.S. and are not hydrologically connected to waters of the U.S.

The RWQCB also administers the Construction Stormwater Program and the federal National Pollution Discharge Elimination System (NPDES) program. Projects that disturb one or more acres of soil must obtain a Construction General Permit under the Construction Stormwater Program. A prerequisite for this permit is the development of a Stormwater Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Projects that discharge wastewater, stormwater, or other pollutants into a Water of the U.S. may require a NPDES permit.

California Department of Fish and Game Code, Section 1602. The CDFW has jurisdiction over the bed and bank of natural drainages and lakes according to provisions of Section 1602 of the California Fish and Game Code. Activities that may substantially modify such waters through the diversion or obstruction of their natural flow, change or use of any material from their bed or bank, or the deposition of debris require a Notification of Lake or Streambed Alteration. If the CDFW determines that the activity may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. Such an agreement typically stipulates that certain measures will be implemented to protect the habitat values of the lake or drainage in question.

3.2.6 City of Antioch Tree Preservation Ordinance

The City of Antioch has a tree ordinance (Chapter 5, Article 12, Section 9-5.12.05 of the City's Zoning Ordinance "Tree Preservation and Regulation"), which stipulates that tree removal is evaluated as part of the development application process for proposed projects. The ordinance breaks down trees that are proposed for removal into six different categories for purposes of determining the appropriate number of replacement trees that will be required:

- An "established" tree is any tree that is at least ten inches in diameter at breast height (DBH), measured 4.5 feet above natural or finished grade.
- An "indigenous tree" is a naturally growing tree of the following species: Blue Oak *(Quercus douglasii*), Valley Oak (*Quercus lobata*), Coast Live Oak (*Quercus agrifolia*), Canyon Live Oak (*Quercus chrysolepis*), Interior Live Oak (*Quercus wislizenii*), California Buckeye (*Aesculus californica*), and California Bay (*Umbellularia californica*).
- A "landmark tree" is any tree that is at least 48 inches in DBH and/or is over 40 feet in height. • A mature tree is any tree that is at least 26 inches in DBH.
- A street tree is any tree planted within a public right-of-way and/or a tree planting easement.
- A "protected tree" is any tree required to be preserved as a condition of an approval from a regular development application.

The tree ordinance requires that any tree approved for removal will be replaced. Requirements for replacement trees includes two 24-inch box trees for each "established" tree, two 48-inch box trees for each "mature" tree, and the City Council has discretion in determining the appropriate ratio of box tree replacements for any "landmark" or "indigenous" trees.

Several trees occur on the site that would be considered "established" and/or "indigenous" trees including blue and valley oaks.

3.3 IMPACTS SPECIFIC TO THE PROJECT

Based on the Vesting Tentative Map for the Albers Property (CBG Engineers 2021) the majority of the site would be developed into a 288 single-family home subdivision, roads and assisted living development in the western portion of the site near Deer Valley Road. The remainder of the site would include approximately 40 acres of open space, approximately seven acres of water quality facilities including detention basins, and a 1.5-acre park. As discussed above, activities resulting in impacts to biotic resources may be regulated by local, state, and federal laws. The natural resource issues specific to this project are discussed in detail below.

3.3.1 Potential Project Impacts to Special Status Plants

Potential Impact. Most special status plant species known to occur, or to once have occurred, in the project region are considered absent from the site due to the absence of suitable habitat for these species, including the absence of serpentine soils, marshes and swamps, and inland dunes; or because the species is a perennial shrub or herb that would have been observed if present during the May 2021 site survey. Several other special status plant species are considered unlikely to occur on the site because habitats of the site are extremely limited (such as grasslands occurring at the margins of the wheat fields) or extremely marginal (due to decades of agricultural disturbance, etc.) for these species, and/or the species may not be known to occur in the project vicinity (i.e., within a three-mile radius), and/or the species has not been observed in many decades in the project region.

Soils of the study area are alkaline, and grasslands occurring at the edges of the wheat fields on alkaline soils, and/or wetlands occurring on alkaline soils, may provide potential habitat for several special status plant species including Contra Costa goldfields (*Lasthenia conjugens*), alkali milk-vetch (*Astragalus tener* var. *tener*), heartscale (*Atriplex cordulata*), brittlescale (*Atriplex depressa*), lesser saltscale (*Atriplex minuscula*), dwarf downingia (*Downingia pusilla*), Jepson's coyote-thistle (*Eryngium jepsonii*), shining navarretia (*Navarretia nigelliformis* ssp. *radians*), bearded popcornflower (*Plagiobothrys hystriculus*), California alkali grass (*Puccinellia simplex*), and long-styled sand-spurrey (*Spergularia macrotheca var. longistyla*). Additionally, one other special status plant, San Joaquin spearscale (*Extriplex joaquinana*), has actually been observed on the site in two different locations in the past.

Focused floristic surveys during the appropriate blooming season in all potentially suitable habitats for these species would be necessary to determine whether the proposed project would impact any populations of these species. Should focused surveys determine populations of any of these species are present on the site, and if the project as proposed would impact these populations, this could be considered a potentially significant impact of the project.

3.3.2 Loss of Habitat for Special Status Animals

Potential Impact. Thirty-seven special status animal species occur, or once occurred, regionally (see Table 2). Of these, 21 species would be absent or unlikely to occur on the site due to a lack of suitable habitat for these species. The species that would be absent or unlikely to occur include the Lange's metalmark butterfly, Conservancy fairy shrimp, longhorn fairy shrimp, steelhead, longfin smelt, foothill yellow-legged frog, Sacramento perch, California glossy snake, northern California legless lizard, coast horned lizard, Alameda whipsnake, San Joaquin whipsnake, giant garter snake, American peregrine falcon, California least tern, bank swallow, yellow-breasted chat, California yellow warbler, tricolored blackbird, San Francisco dusky-footed woodrat, and San Joaquin kit fox.

The remaining 17 special status animal species from Table 2 potentially occur more frequently as potential foragers or transients, may be resident to the site, or may occur within areas adjacent to the site. These include vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, California red-legged frog, western pond turtle, Swainson's hawk, white-tailed kite, northern harrier, golden eagle, burrowing owl, short-eared owl, loggerhead shrike, grasshopper sparrow, Townsend's big-eared bat, pallid bat, western red bat, and American badger.

No evidence of bats was observed during reconnaissance surveys, and onsite trees do not support suitable roosting habitat for bats, therefore, these species are expected to only forage on the site and do not require preconstruction surveys or other mitigation measures.

The loss of agricultural habitat, which does not contain regionally important habitat for the above-mentioned listed species, will not result in a significant loss of habitat for the species listed in Table 2.

The project does have the potential to result in an impact to construction-related injury or mortality of nesting migratory birds and raptors, vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, California red-legged frog, western pond turtle, Swainson's hawk, white-tailed kite, northern harrier, golden eagle, burrowing owl, short-eared owl, loggerhead shrike, grasshopper sparrow, American badger, and San Joaquin kit fox as discussed below in Sections 3.3.5 through 3.3.13.

Mitigation. No mitigation warranted.

3.3.3 Loss of Habitat for Native Wildlife

Potential Impact. The habitats of the site comprise only a small portion of the regionally available habitat for plant and animal species that are expected to use the habitat. The proposed project would result in the loss of agricultural habitat. This is not expected to result in a significant loss of habitat for local wildlife. Therefore, impacts due to the loss of habitats for native wildlife resulting from the proposed project are considered less-than-significant.

Mitigation. No mitigation would be warranted for the loss of habitat for native wildlife.

3.3.4 Interference with the Movement of Native Wildlife

Potential Impact. The development of the site as currently planned would not constrain native wildlife movement. Most wildlife using the adjacent Sand Creek as a local movement corridor would likely continue to use it in the same manner after site development.

Mitigation. No mitigation warranted.

3.3.5 Potential Impacts to Nesting Migratory Birds Including Nesting Raptors and Protected Birds

Potential Impacts. Trees and ground on the project site and the riparian habitat adjacent to Sand Creek may support nesting birds and raptors. Buildout of the project during the nesting period for migratory birds (i.e., typically between February 1 to August 31), including initial site grading, soil excavation, and/or tree and vegetation removal, poses a risk of nest abandonment and death of any live eggs or young that may be present in nests within or near the site. Such an effect would be considered a significant impact. To ensure that any active nests will not be disturbed, and individual birds will not be harmed by construction activities, the following measures should be followed.

3.3.6 Potential Impacts to Listed Fairy Shrimp

Potential Impacts. The site has potential to support vernal pool fairy shrimp and vernal pool tadpole shrimp, as a seasonal wetland complex in the eastern portion of the site that is potentially capable of supporting vernal pool branchiopods. To ensure these species will not be disturbed, and individuals will not be harmed by construction activities, the following measures should be followed.

3.3.7 Potential Impacts to California Tiger Salamander

Potential Impacts. Sand Creek, a tributary of Sand Creek, and the seasonal wetlands on and adjacent to the site support potentially suitable breeding habitat. Impacts to individual CTS or to known breeding pools would be considered a significant impact. To ensure that CTS will not be harmed by construction activities, the following measures should be followed.

3.3.8 Potential Impacts to California Red-Legged Frogs

Potential Impacts. Potentially suitable upland habitat for the California red-legged frog (CRLF) is present within the project site in the form of riparian habitat associated with Sand Creek as well as the tributary of Sand Creek on the western side of the project site; currently impacts are not expected to occur within Sand Creek. CRLF may also be expected to move out of the riparian area onto the upland portion of the site from time to time as well. Injury or mortality of an individual CRLF would be considered a significant impact to CRLF under CEQA.

3.3.9 Potential Impacts to Western Pond Turtles

Potential Impacts. The proposed project would result in the loss of a small area of upland habitat for western pond turtles. Impacts to WPT habitat would be considered minimal. However, it is possible that WPT would move into the construction zone, which may result in mortality to individual western pond turtles. The loss of these individuals would constitute a significant impact under CEQA.

3.3.10 Potential Impacts to Swainson's Hawk

Potential Impacts. Trees along the margins of the site support potentially suitable nesting habitat and the remainder of the site supports foraging habitat for the SWHA. There have been 30 documented sightings within a ten-mile radius of the project site (Figure 4c) with the closest being within a quarter mile of the site. Therefore, as SWHA is known to nest and forage within the area, they have some potential to occur onsite which may result in mortality to individual SWHA. The loss of these individuals would constitute a significant impact under CEQA.

3.3.11 Potential Impacts to Golden Eagle

Potential Impacts. Although nesting habitat is absent from the site and golden eagles are not known to nest within three miles of the site, should, in the future, a golden eagle nest occur within a half-mile of the site and be within line of site from the site, particular construction activities has the small potential to impact an active nest. The project would not result in a significant loss of foraging habitat for the golden eagle. An impact to an active golden eagle nest would constitute a significant impact under CEQA.

3.3.12 Potential Impacts to Western Burrowing Owls

Potential Impacts. The site supports potentially suitable habitat for burrowing owls in the form of ground squirrel burrows. Should site demolition or grading occur during the nesting season for this species (February 1 through August 31), nests and nestlings that may be present would likely be destroyed. Overwintering burrowing owls may also be buried in their roost burrows outside of the nesting season (September 1 through January 31). Any actions related to site development that result in the mortality of burrowing owls would constitute a violation of the federal Migratory

Bird Treaty Act and provisions of the California Fish and Game Code and would constitute a significant impact under CEQA.

3.3.13 Potential Impacts to American Badgers

Potential Impacts. Suitable habitat for American badgers occurs on the site. Additionally, they have been observed adjacent to the site. The site may be used by badgers for movement, foraging, and breeding. No badgers or badger burrows were observed on the project site during the May 2021 survey; however, should badgers occur onsite at the time of construction, the project could result in mortality of individuals of this species, which would constitute a significant impact under CEQA.

3.3.14 Potential Impacts to San Joaquin Kit Fox

Potential Impacts. The site supports marginal habitat for the San Joaquin kit fox as it has been highly modified for agricultural use (e.g., dryland farmed) and the site sits on the western edge of development in this region of Antioch. While an extensive survey for burrows was not completed, no suitable burrows were detected nor would we expect to find any given site conditions and the fact that kit fox have not been observed in the region for more than 25 years. Therefore, the site supports only marginal foraging and dispersal habitat for the kit fox. Therefore, development of the site would result in a less than significant loss of foraging or dispersal habitat for the kit fox.

While unlikely that a kit fox would ever occur on site, if they did prior to construction, site development might harm or injury an individual kit fox. This would result in a significant impact to individual kit foxes.

3.3.15 Potential Impacts to Riparian Habitat and Other Sensitive Natural Communities, Including Federally and State Protected Wetlands

Potential Impacts. Jurisdictional waters of the U.S. and state under the jurisdiction of the U.S. Army Corps of Engineers (USACE), the Regional Water Quality Control Board (RWQCB) and the California Department of Fish and Wildlife (CDFW) are present on the site in the form of Sand Creek and its unnamed tributary, which occur in the northern and western portions of the site. The limits of USACE jurisdiction would be the Ordinary High Water mark on opposing banks and the limits of jurisdiction of the CDFW and RWQCB would be the top of the bank or the dripline of woody riparian vegetation, which is ever is greater. A small amount of mixed riparian woodland is present along the southern bank of both channels near the site's northern boundary as previously described in this report. As currently proposed, the project would avoid impacts to the channels and associated riparian habitat as they would be preserved within designated open space (Parcel Y). However, an emergency vehicle access (EVA) road is proposed from Deer Valley Road at the western boundary of the site that would traverse across an area between two segments of the unnamed channel. Depending on the design of the EVA road, its construction could result in temporary or minor permanent impacts to the channel. The project does not currently propose any storm drains into either channel. Should the construction of the EVA road or should the project be revised to include impacts such as storm drain outfalls into the channels on the site, these impacts may be considered significant and may also require permits from the regulatory agencies (see Regulatory Considerations in the section below). A formal wetland delineation would be required to be prepared and submitted to the USACE for a Jurisdictional Determination to determine the extent of the jurisdictional status of the channels.

In addition to the channels, a fairly extensive wetland complex is present at the lower elevations of the eastern portion of the site in an area proposed for development, and there are also three potential wetlands occurring outside of the wetland complex. These wetlands appear to be isolated from other waters of the U.S. and therefore may not be considered jurisdictional by the USACE, however, they likely would be considered jurisdictional by the RWQCB. Project impacts to these wetlands would be considered a significant impact of the project.

3.3.16 Degradation of Water Quality in Seasonal Drainages, Stock Ponds and Downstream Waters

Potential Impact. Eventual site development and construction may require grading that leaves the soil of construction zones barren of vegetation and, therefore, vulnerable to sheet, rill, or gully erosion. Eroded soil is generally carried as sediment in surface runoff to be deposited in natural creek beds, canals, and adjacent wetlands. Furthermore, urban runoff is often polluted with grease, oil, pesticide and herbicide residues, heavy metals, etc. These pollutants may eventually be carried to sensitive wetland habitats used by a diversity of native wildlife species. The deposition of pollutants and sediments in sensitive riparian and wetland habitats would be considered a potentially significant adverse environmental impact. The project would comply with the City of Antioch's grading requirements. Therefore, the project buildout would result in a less-than-significant impact to water quality.

Mitigation. No mitigation is warranted.

3.3.17 Conflict with Local Policies and Ordinances: City of Antioch Tree Ordinance

Potential Impacts. The City of Antioch has a tree ordinance. A tree inventory was not conducted by an arborist for this site; however, trees exist on the site which may require a permit from the city to remove. If any trees are planned to be removed, the loss of ordinance-sized trees without further compliance with the City's tree policies would constitute a significant adverse impact of the project.

3.3.18 Conflict with Habitat Conservation Plans

The proposed project is not within any HCP or NCCP.

3.4 MITIGATION MEASURES

3.4.1 Special-Status Plants

I: Prior to initiation of ground-disturbing activities on the project site and off-site improvement areas, the project applicant shall retain a qualified biologist to conduct focused botanical surveys for Contra Costa goldfields, alkali milk-vetch, heartscale, brittlescale, lesser saltscale, dwarf downingia, Jepson's coyote-thistle, shining navarretia, bearded popcornflower, California alkali grass, long-styled sand spurrey, San Joaquin spearscale, and all plants that are considered locally rare as listed in the East Bay Chapter of the CNPS Database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties for the Marsh Creek/Lone Tree Valley area. Focused botanical survey will be conducted consistent with the CNPS survey protocol (CNPS 1983, revised 2001, or the most current CNPS survey protocol) and the CDFW recommended protocols for botanical resource surveys (CDFW 2018, or the most recent CDFW protocol). These protocols include surveying areas providing potential habitat on foot in such a way as to provide 100% visual coverage of the area in all appropriate blooming seasons. Project construction shall not be initiated until all special-status plant surveys are completed and the mitigation is implemented, if necessary and required prior to starting construction. A special-status plant survey report that includes the methods used, survey participants, and associated findings shall be prepared and submitted to the City no more than 30 days following the completion of the final site visit. A record of any special-status plant species identified within the project site during the preconstruction surveys shall be submitted to the CNDDB. If new special-status plant populations are not found on the site during the appropriately timed surveys, additional mitigation is not required. If construction is not started within two years after the rare plant surveys are completed, the city may require additional rare plant surveys.

If special-status plants are observed on the site during the survey, the populations shall be avoided to the maximum degree possible during project development, and a Mitigation and Monitoring Plan (MMP) shall be prepared detailing the measures to be implemented to avoid any retained plant populations. The MMP shall include establishment of appropriate buffers during construction, fencing of the population prior to and during construction, and regular monitoring of the preserved population by a biologist during and after construction activities. The MMP shall be implemented prior to the initiation of project grading.

If plant populations cannot be fully avoided, the applicant shall hire a qualified biologist to prepare an on-site or off-site MMP in coordination with the City of Antioch to reduce impacts to the identified special-status plant populations to a less-than-significant level, subject to review and approval by the City of Antioch Community Development Department. At a minimum, the MMP will include:

- Location of suitable on-site or off-site areas to establish new populations.
- Means by which established populations will be conserved in-perpetuity.
- Methods of site preparation, seed/plant procurement, and plant establishment.

A monitoring plan that includes the length of monitoring (typically at least five years), monitoring interval (typically annually), interim and final success criteria, and an adaptive management plan to describe measures that will be taken in the case that interim or final success criteria goals are not met.

3.4.2 Nesting Migratory Birds Including Nesting Raptors and Protected Birds

II (a): If initial site disturbance activities, including tree, shrub, or vegetation removal, are to occur during the breeding season (typically February 1 to August 31), a qualified biologist would conduct pre-construction surveys for nesting migratory birds and raptors. The survey for nesting migratory birds would cover the project site itself, and the survey for nesting raptors would encompass the site and surrounding lands within 250 feet, where accessible. The survey should occur within 14 days prior to the onset of ground disturbance. If a nesting migratory bird were to be detected, an appropriate construction-free buffer would be established. Actual size of buffer, which would be determined by the project biologist, would depend on species, topography, and type of activity that would occur in the vicinity of the nest. The project buffer would be monitored periodically by the project biologist to ensure compliance. After the nesting is completed, as determined by the biologist, the buffer would no longer be required.

II(b): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if an active bird nest is observed.

3.4.3 Listed Fairy Shrimp

III(a): If avoidance of potential fairy shrimp habitat is not possible, mitigation for the loss of fairy shrimp habitat should be a combination of preserving occupied and potentially occupied habitat at a 3:1 ratio (preserved:impacted) and creating additional habitat at a 2:1 ratio (created:impacted). Preservation or created habitat shall be via the purchase of mitigation land in fee title or via recordation of a conservation easement to be preserved in perpetuity. Preservation and creation of suitable habitat shall include the development of a Habitat Mitigation and Management Plan (HMMP) which will outline the requirements for managing preserved areas and created areas as well as success criteria for the created habitat. Fairy shrimp habitat shall be established at least a year prior to onsite impacts to fairy shrimp habitat in order to monitor the new habitat's effectiveness, including a comparison to the existing onsite habitat with regards to appropriate hydrology for fairy shrimp.

Once it has been determined the created habitat supports the appropriate hydrology, the top four inches of topsoil of the onsite habitat planned to be impacted and transferred to the mitigation site in the same day. Removal and placement of this topsoil shall be done in a systematic fashion that will avoid compaction of the soil.

III(b): The HMMP will provide methodology for monitoring the both the preserved and created fairy shrimp habitat for five years and will also provide success criteria. The HMMP will follow the guidelines for mitigation and monitoring of vernal pools issued by the USFWS (1994).

III(c): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a listed fairy shrimp is observed.

III(d): As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written “Conditions of Coverage” by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or
2. Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the city, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.

3.4.4 California Tiger Salamander

IV(a): During the rainy season, the seasonal wetlands in the eastern portion of the site shall be assessed to determine whether they could be classified as breeding habitat for the CTS. All other potential breeding areas (Sand Creek and the tributary of Sand Creek) are not being impacted.

IV(b): If all potential CTS breeding areas cannot be avoided will be avoided, compensation for loss of breeding habitat at a ratio of 3:1 and compensation for loss of upland habitat at a ratio of 3:1 will be required. Preservation or created habitat shall be via the purchase of mitigation land in fee title, via recordation of a conservation easement to be preserved in perpetuity, or by purchasing credits at a mitigation bank.

IV(c): Pre-construction surveys should be conducted to ensure that CTS are absent from the construction area. If CTS are present, they should be relocated by a qualified biologist.

IV(d): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a California tiger salamander is observed.

***IV(e): Regulatory issues*.** If breeding habitat is planned to be removed, in addition to evaluating the potential of the project to affect the CTS under CEQA, the applicant would need to comply with provisions of the federal Endangered Species Act and would need to seek take authorization from the USFWS for project-related losses as required by law. To obtain a take permit, consultation with the U.S. Fish and Wildlife Service would need to be initiated either through a federal nexus (i.e., Section 7 consultation, usually through the USACE or the Bureau of Land Management) or through the HCP process (i.e., Section 10 consultation).

IV(f): As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written “Conditions of Coverage” by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or
2. Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.

3.4.5 California Red-Legged Frog

V(a): Prior to the start of construction, an approved qualified biologist should train all construction personnel regarding habitat sensitivity, identification of special status species, and required practices.

V(b): Pre-construction surveys should be conducted to ensure that CRLF are absent from the construction area. If CRLF are present, they should be relocated by a qualified biologist.

V(c): The construction zone should be cleared, and silt fencing should be erected and maintained around construction zones to prevent CRLF from moving into these areas.

V(d): A biological monitor should be present onsite during particular times of construction to ensure no CRLF are harmed, injured, or killed during project buildout.

V(e): Upland habitats should be managed via a long-term management plan to maintain the quality of the habitat for the movement and dispersal of CRLF. Potential opportunities include enhancement of the channels and riparian corridor (e.g., formation of plunge pools) would also maximize opportunities for CRLF to disperse from the ponds to even higher-quality habitat off-site.

V(f): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a California red-legged frog is observed.

V(g): Regulatory issues**.** At this time breeding habitat is not planned to be impacted, however, if at a later time, breeding habitat is planned to be removed, in addition to evaluating the potential of the project to affect the CRLF under CEQA, the applicant would need to comply with provisions of the federal Endangered Species Act and would need to seek take authorization from the USFWS for project-related losses as required by law. To obtain a take permit, consultation with the U.S. Fish and Wildlife Service would need to be initiated either through a federal nexus (i.e., Section 7 consultation, usually through the USACE or the Bureau of Land Management) or through the HCP process (i.e., Section 10 consultation).

V(h): As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or
2. Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.

3.4.6 Western Pond Turtle

VI(a): Implementation of the measures for the CRLF (see mitigation measure V above) would adequately address impacts to western pond turtles. Should a western pond turtle be observed onsite, it shall be allowed to leave the site on its own or be relocated by a CDFW-approved biologist. Should a western pond turtle nest site be observed, a 50-foot construction-free buffer shall be established and maintained until a qualified biologist determines the nest is no longer active.

VI(b): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a western pond turtle is observed.

3.4.7 Swainson's Hawk

VII(a): During the nesting season prior to the construction on the project site within a half-mile of a potential nest tree, preconstruction surveys shall be conducted within the construction zones and adjacent lands to identify any nesting pairs of Swainson's hawks. These surveys will conform to the guidelines of CDFW as presented in *RECOMMENDED TIMING AND METHODOLOGY FOR SWAINSON'S HAWK NESTING SURVEYS IN CALIFORNIA'S CENTRAL VALLEY,* Swainson's Hawk Technical Advisory Committee, May 31, 2000. No preconstruction surveys are required for construction activity located farther than a half-mile from a potential nest tree.

VII(b): Should any active nests be discovered in or near proposed construction zones, the qualified biologist shall establish a suitable construction-free buffer around the nest. This buffer shall be identified on the ground with flagging or fencing and shall be maintained until the biologist has determined that the young have fledged.

VII(c): All workers on the construction of the Project Site shall attend tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a Swainson's hawk is observed on or near the construction zone.

VII(d): As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or
2. Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.

3.4.8 Golden Eagle

VIII(a): Preconstruction surveys for golden eagle nests would be conducted concurrently with preconstruction surveys for Swainson's hawk nests. Should an active golden eagle nest be observed within a half-mile of the site and be within the line of site from the site, biological monitors would monitor the nest in order to establish baseline behavioral data. Based on the baseline behavioral data and location in the nest (i.e., whether the nest is remote or in/close to town and whether it has existing disturbances), a construction-free buffer shall be established. The construction-free buffer will be a minimum of 800 feet and can be increased based on the biological monitor's observations of the behavior at the nest.

VIII(b): All workers on the construction of the Project Site shall attend tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a golden eagle is observed on or near the construction zone.

3.4.9 Western Burrowing Owl

IX(a): Preconstruction surveys are required to ascertain whether or not burrowing owls occupy burrows on or adjacent to the site. Preconstruction surveys will be conducted in accordance with the CDFW's *Staff Report on Burrowing Owl Mitigation* (2012). These surveys consist of a minimum of two surveys, with the first survey being no more than 14 days prior to initial construction activities (i.e., vegetation removal, grading, excavation, etc.) and the second survey conducted no more than 24 hours prior to initial construction activities. Surveys will ensure 100% visual coverage. If no burrowing owls or fresh sign of burrowing owls are observed during preconstruction surveys, construction may proceed. If burrowing owls or their recent sign are observed during these surveys, occupied burrows will be identified by the monitoring biologist and a 250-foot buffer will be established and maintained until a qualified biologist has determined the burrowing owl has abandoned the burrow.

IX(b): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a western burrowing owl is observed.

3.4.10 American Badger

X(a): During the course of the preconstruction surveys for other species, a qualified biologist shall also determine the presence or absence of badgers prior to the start of construction. If badgers are found to be absent, no other mitigations for the protection of badgers shall be warranted.

X(b): If an active badger den is identified during pre-construction surveys within or immediately adjacent to an area subject to construction, a construction-free buffer of up to 300 feet shall be established around the den. Once the biologist has determined that badger has vacated the burrow, the burrow can be collapsed or excavated, and ground disturbance can proceed. Should the burrow be determined to be a natal or reproductive den, and because badgers are known to use multiple burrows in a breeding burrow complex, a biological monitor shall be present onsite during construction activities in the vicinity of the burrows to ensure the buffer is adequate to avoid direct impact to individuals or natal/reproductive den abandonment. The monitor will be required to be present until it is determined that young are of an independent age and construction activities would not harm individual badgers.

X(c): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if an American badger is observed.

3.4.11 San Joaquin Kit Fox

XI(a): During the course of the preconstruction surveys for other species, a qualified biologist shall also determine the presence or absence of kit fox prior to the start of construction. If badgers are found to be absent, no other mitigations for the protection of badgers shall be warranted.

XI(b): If an active kit fox den is identified during pre-construction surveys within or immediately adjacent to an area subject to construction, a construction-free buffer of up to 300 feet shall be established around the den. Once the biologist has determined that kit fox has vacated the burrow, the burrow can be collapsed or excavated, and ground disturbance can proceed. Should the burrow be determined to be a natal or reproductive den, a biological monitor shall be present onsite during construction activities in the vicinity of the burrows to ensure the buffer is adequate to avoid direct impact to individuals or natal/reproductive den abandonment. The monitor will be required to be present until it is determined that young are of an independent age and construction activities would not harm individual kit fox.

XI(c): All workers on the project shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a kit fox is observed.

3.4.12 Riparian Habitat and Other Sensitive Natural Communities, Including Federally and State Protected Wetlands

XII: Prior to the initiation of ground-disturbing activities, a formal wetland delineation will be conducted on the site and submitted to the USACE for verification to determine the extent of all hydrological features, their jurisdictional status, and the extent of any impacts of the currently proposed project. A summary of the wetland delineation shall be submitted to the City of Antioch Community Development Department.

IV-13(b). Prior to discharging any dredged or fill materials into any waters of the U.S. within the project site and/or the off-site improvement areas, the applicant shall obtain permit authorization to fill wetlands under Section 404 of the federal Clean Water Act (CWA) (Section 404 Permit) from USACE. The Section 404 Permit application shall include an assessment of directly impacted, avoided, and preserved acreages to waters of the U.S. Mitigation measures shall be developed as part of the Section 404 Permit to ensure no net loss of wetland function and values. Mitigation for direct impacts to waters of the U.S. within the project site and/or the off-site improvement areas would occur at a minimum of 1:1 ratio for direct impacts by purchasing seasonal wetland credits from the Cosumnes Mitigation Bank or other wetland mitigation bank that services the project site, and is approved by the USACE and the RWQCB.

Alternatively, the project applicant may create, preserve, and manage new seasonal wetlands on or off of the project site that is of equal or greater quality to the habitats being impacted at a minimum 1:1 mitigation ratio. A project-specific Wetland Mitigation and Monitoring Plan prepared by a qualified wetland restoration ecologist that includes the following information shall be provided to the City of Antioch Community Development Department prior to conducting any activity that would result in the placement of any fill material into a water of the U.S. or water of the State:

A description of the impacted water;

- A map depicting the location of the mitigation site(s) and a description of existing site conditions;

- A detailed description of the mitigation design that includes: (i) the location of the created wetlands; (ii) proposed construction schedule; (iii) a planting/vegetation plan; (iv) specific monitoring metrics, and objective performance and success criteria, such as delineation of created area as jurisdictional waters using USACE published methods; and (v) contingency measures if the created wetlands do not achieve the specified success criteria; and
- Short-term and long-term management and monitoring methods.

If the wetland mitigation site is a separate mitigation property, the project applicant will grant a conservation easement to a qualified entity, as defined by Section 81.5.3 of the California Civil Code, preserving the created seasonal wetland(s) in perpetuity, and establish an endowment fund to provide for the long-term management, maintenance, and monitoring of the created seasonal wetland(s). If the proposed project includes placing fill material into jurisdictional waters of the U.S. or waters of the State, the project applicant shall provide the City of Antioch Community Development Department with a copy of permits issued by the USACE and RWQCB authorizing the fill.

In addition, a Water Quality Certification or waiver pursuant to Section 401 of the CWA must be obtained for Section 404 permit actions. Proof of compliance with the mitigation measure shall be submitted to the City of Antioch Community Development Department prior to the issuance of grading permits.

IV-13(c). Impacts to riparian habitat within CDFW's Section 1602 jurisdictional areas that would occur during construction shall be mitigated through planting California native trees and/or shrubs within the Sand Creek buffer area. Impacted trees and shrubs shall be mitigated with a 3:1 (replacement:impacts) ratio. Replacement trees and shrubs shall be a minimum of one gallon size trees/shrub replacements.

In addition, the project applicant will implement appropriate BMPs to prevent construction related impacts that could result in discharge of eroded soils or pollutants into Sand Creek and the creek's tributaries. The measures shall include the installation of wildlife-friendly hay wattles and/or silt fence that will prevent unintended impacts during construction activities associated with Sand Creek. In addition, orange silt fencing shall be installed at the top-of-bank of Sand Creek to prevent unintended human and equipment traffic adjacent to Sand Creek. Finally, the dripline of all retained trees within the drainages on the project site, if near work areas, shall be protected through the installation of orange construction fencing.

The project applicant shall satisfy this mitigation by providing the City of Antioch Community Development Department with a fully executed copy of a CDFW Section 1600 Streambed Alteration Agreement (SAA) that includes these, or other functionally equivalent, BMPs, prior to any construction activities associated with Sand Creek. In addition to the mitigation requirements outlined here, the project applicant shall implement any additional conditions contained in the SAA.

3.4.13 Trees

XII: As ordinance-sized trees may occur onsite, mitigation for removal of any ordinance-sized trees shall follow the City's tree ordinance requirements which may require planting of replacement trees or fees.

4 LITERATURE CITED

Beier, P. and S. Loe. 1992. A Checklist for Evaluating Impacts to Wildlife Movement Corridors. Wildlife Society Bulletin 20(4):434-440.

California Department of Fish and Game. 2002. California Fish and Game code. Gould Publications. Binghamton, N.Y.

California Department of Fish and Wildlife. 2021. Annual Report on the Status of California State Listed Threatened and Endangered Animals and Plants. The Resources Agency, Sacramento, CA.

California Department of Fish and Wildlife. 2021. California Natural Diversity Database, Rarefind5. The Resources Agency, Sacramento, CA.

California Native Plant Society (CNPS). 2021. Inventory of Rare and Endangered Plants (online edition, v6-05c). California Native Plant Society. Sacramento, CA. http://www.cnps.org/inventory.

CBG Civil Engineers. 2021. Albers Property Vesting Tentative Map.

City of Antioch Municipal Code.

Harris, L.D., Gallagher, P.B., 1989. New initiatives for wildlife conservation: the need for movement corridors. In: Mackintosh, G. (Ed.), Preserving Communities and Corridors. Defenders of Wildlife, Washington DC, pp. 11–34.

Holland, R.F. 1986. Preliminary Description of the Terrestrial Natural Communities of California. Resources Agency, Sacramento, CA. 156 pp.

Mayer, K. E., and W. F. Laudenslayer, Jr. Ed. 1988. A guide to wildlife habitats of California. California Department of Forestry and Fire Protection. Sacramento, CA. 166 pp.

Moyle, P.B., R. M. Quiñones, J. V. Katz and J. Weaver. 2015. Fish Species of Special Concern in California. Sacramento: California Department of Fish and Wildlife. www.wildlife.ca.gov

Natural Resource Conservation Service. 2021. Web Soil Survey. USDA.

Remy, M. H., T. A. Thomas, J. G. Moose, and W. F. Manley. 1996. Guide to the California Environmental Quality Act.

Shuford, W. David and Thomas Gardall eds. 2008. California Bird Species of Special Concern. Western Field Orinthologists and California Department of Fish and Game.

Thomson, Robert C., Amber N. Wright, and H. Bradley Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. California Department of Wildlife. University of California Press.

USACE. 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army.

U.S. Fish and Wildlife Service. 2021. Endangered and threatened wildlife and plants.

Wetland Training Institute, Inc. 1990. Federal Wetland Regulation Reference Manual. B.N. Goode and R.J. Pierce (eds.) WTI 90-1. 281pp.

APPENDIX B

PRELIMINARY GEOTECHNICAL EXPLORATION

1319-00
SOILS

ENGEO
INCORPORATED
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS

PRELIMINARY GEOTECHNICAL EXPLORATION

SULLENGER RANCH

ANTIOCH, CALIFORNIA

SUBMITTED

TO

CENTEX HOMES CORPORATION

SAN RAMON, CALIFORNIA

DRAFT

PREPARED

BY

ENGEO INCORPORATED

PROJECT NO. 6826.1.001.01

JUNE 29, 2005

ENGEO
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
WATER RESOURCES
CONSTRUCTION SERVICES

Project No.
6826.1.001.01

June 29, 2005

Mr. John Buller
Centex Homes Corporation
2527 Camino Ramon, Suite 100
San Ramon, California 94583

Subject: Sullenger Ranch
Antioch, California

PRELIMINARY GEOTECHNICAL EXPLORATION

Dear Mr. Buller:

With your authorization, we have conducted a preliminary geotechnical exploration for the proposed residential development on the Sullenger Ranch property east of Deer Valley Road and south of Sand Creek in Antioch, California. The accompanying report contains our exploration data and our preliminary conclusions and recommendations for residential construction on the subject property. It is our preliminary opinion that the proposed residential development is feasible from a geotechnical standpoint provided the design level recommendations are incorporated into project plans and implemented during construction.

We are pleased to be of service to you on this project and will continue to consult with you and your design team as project planning progresses.

Very truly yours,

ENGEO INCORPORATED | Reviewed by:

Kelsey Adams | Josef J. Tootle, GE

ka/jt/reviewed by dsh/jb:prelimgex

cc: 1 – Mr. Grant Gibson, CBG

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www.engeo.com

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

INTRODUCTION

Purpose and Scope

The purpose of this preliminary geotechnical report is to provide preliminary recommendations regarding the suitability of the site for development, as well as grading and foundation design criteria for the proposed residential development.

Our scope of services as described in our proposal dated May 17, 2005, included:

- Exploratory drilling of five to eight test borings and excavation of 10 to 16 test pits within the site.
- Sampling and laboratory testing of subsurface materials from the borings.
- Logging and visual observation of the borings and test pits.
- Review of historical aerial photographs.
- Preliminary assessment of geological hazards and development of the 1997 UBC seismic design criteria.
- Preliminary recommendations for mitigation of geotechnical constraints such as landslide hazards and expansive soils as necessary.
- Preliminary grading and foundation type recommendations for the proposed development.
- Reporting our preliminary findings and recommendations.

This preliminary report was prepared for the exclusive use of Centex Homes Corporation and their design team consultants. In the event that any changes are made in the character, design, or layout of the development, the preliminary conclusions and recommendations contained in this report must be reviewed by ENGEO Incorporated to determine whether modifications to the report are necessary. This document may not be reproduced in whole or in part by any means whatsoever, nor may it be quoted or excerpted without the expressed written consent of ENGEO Incorporated.

Site Location and Description

The site is located east of Deer Valley Road and south of Sand Creek in Antioch, California (Figure 1). The parcel (as shown on Figure 2) is approximately 104 acres and is identified by Assessors Parcel Numbers (APN) 057-042-006 and 057-050-005.

The site sits on a fairly hilly parcel ranging in elevation from approximately 200 feet above mean sea level (msl) to approximately 327 feet above msl. The site is bounded by Deer Valley Road to the east, Sand Creek to the north, and vacant fields to the east and south. Natural slope gradients at the site range from around 2:1 or steeper along the creek to relatively flat in the southeast-trending valley in the southeast portion of the site. Existing vegetation consist of native grasses. The property is currently being used for cattle grazing and is surrounded with fencing. One large oak tree is located on-site near the center of the property.

Proposed Development

Based upon preliminary hand-drawn plans prepared by Carlson, Barbee & Gibson, Inc., it is proposed to develop the property with 150 single-family lots and associated roadways and underground utilities. We anticipate that the structures will be one to two stories in height and of wood-framed construction; therefore, the building loads are expected to be light to moderate. Site grading will involve cuts up to approximately 125 feet and fills up to approximately 20 feet in order to create the building pads and street areas.

GEOLOGY AND SEISMICITY

Site Geology

The geology of the area consists mainly of Quaternary alluvium (Qa; Dibblee, 1980). The hilly portions of the site are composed of Markley Sandstone (Tkm; Dibblee, 1980) which is a tan, arkosic sandstone or minor shale. A small amount of Nortonville Shale (Tkn; Dibblee, 1980), a micaceous clay shale, is present in the southwest portion of the site.

Site Soils

Soils at the property have been classified by the U.S. Department of Agriculture as mainly belonging to the Altamont-Fontana (AcF) complex (USDA, 1977). Smaller portions of the property are additionally classified as Altamont clay (AbE), Capay clay (CaA), Pescadero clay loam (Pb) and Rincon clay loam (RbA) (USDA, 1977). The Altamont-Fontana complex is mapped over most of the site, and is composed of approximately 50 percent clay, 30 percent silty clay loam, with the remainder being comprised of other clay and loam.

Faulting and Seismicity

The site is located in a region that contains numerous active earthquake faults. However, no Holocene active faults are mapped across the site by the California Division of Mines and Geology (CDMG) or United States Geological Survey (USGS) and the site is not located within a State-mandated Earthquake Fault Zone. However, according to published maps by Jennings (1994), Bortugno (1991), and Graymer (1994) the potentially active Antioch-Davis fault crosses through the west-central portion of the project site (Figure 2).

Numerous small earthquakes occur every year in the San Francisco Bay Region, and larger earthquakes have been recorded and can be expected to occur in the future. Figure 4 shows the approximate locations of major faults and significant historic earthquakes recorded within the San Francisco Bay Region. The nearest strike-slip fault zoned as active[1] by the State of California Geological Survey is the Greenville Fault, located about 9.0 kilometers to the southwest (Figure 4). According to attenuation relationships developed by Idriss (1994), the Greenville fault is considered capable of causing a probable[2] mean horizontal site acceleration of approximately 0.34g for a maximum moment magnitude of 6.7 (Blake, 2000).

The regional seismicity of the Bay Area has recently been evaluated by the Working Group on Northern California Earthquake Probabilities (2003). The Working Group periodically attempts to summarize seismic risk in the Bay Area by presenting probabilities of M 6.7 or greater earthquakes on active Bay Area faults for a 30-year return interval. The most recent summary gives a 62 percent aggregate probability for the entire Bay Area. The Hayward-Rodgers Creek Fault, Calaveras Fault, and Concord/Green Valley Fault are assigned 27 percent, 11 percent and 4 percent probabilities, respectively.

A segment of the Great Valley Fault has been identified within 10 miles of the site. The Great Valley Fault is a blind thrust fault with no known surface expression; the postulated fault location has been based on regional seismic activity and isolated subsurface information.

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[1] An active fault is defined by the State Mining and Geology Board as one that has had surface displacement within Holocene time (about the last 10,000 years) (Hart, 1992). A potentially active fault is defined by the State Mining and Geology Board as one that has had surface displacement within Pleistocene time (about the last 2,000,000 years) (Hart, 1992).

[2] From California Division of Mines and Geology Note 43: "The maximum probable earthquake is the maximum earthquake that is likely to occur during a 100-year interval. It is to be regarded as a probable occurrence, not as an assured event that will occur at a specific time." "The maximum credible earthquake is the maximum earthquake that appears possible under the presently known tectonic framework. It is a rational and believable event that is in accord with all known geologic and seismologic facts. In determining the maximum credible earthquake, little regard is given to its probability of occurrence, except that its likelihood of occurring is great enough to be of concern."

Portions of the Great Valley fault are considered seismically-active thrust faults; however, because this fault does not extend to the ground surface, it is not zoned as active by the State of California. The Great Valley fault is considered capable of causing the highest ground shaking at the site, but the recurrence interval is believed longer than for more distant, strike-slip faults. Recent studies suggest that this boundary fault may have been the cause of the Vacaville-Winters earthquake sequence of April 1892 (Eaton, 1986; Wong and Biggar, 1989; Moores and others, 1991). Further seismic activity can be expected to continue along the western margin of the Central Valley, and as with all projects in the area, the development should be designed to accommodate strong earthquake ground shaking.

GEOTECHNICAL EXPLORATION

Field Exploration

The field exploration for this study was conducted on June 21, 2005, and consisted of drilling five borings (1-B1 through 1-B5) to depths ranging from about 10 to 30 feet below existing grade, and twelve test pits (1-TP1 through 1-TP12), with approximate locations shown on Figure 2. The borings and test pits were roughly located by pacing from existing features and should be considered accurate only to the degree implied by the method used. All ENGEO exploration locations were grouted on the day of the exploration in accordance with Contra Costa County requirements.

The borings were drilled using a truck-mounted, B-24 drill rig equipped with 4-inch-diameter solid flight augers. An ENGEO engineer logged the borings in the field and collected soil samples using 3-inch O.D. California-type split-spoon samplers fitted with 6-inch-long brass liners. The samplers were driven with a 140-pound safety hammer falling a distance of 30 inches. A rope and cat-head system was used to lift the safety hammer during our exploration. The penetration of the sampler into the native materials was field recorded as the number of blows required to drive the sampler 18 inches in 6-inch increments. The boring logs show the number of blows required for the last one foot of penetration. The field logs were used to develop the report boring logs (Appendix A). The logs depict subsurface conditions within the borings for the date of drilling; however, subsurface conditions may vary with time.

Exploratory Test Pits 1-TP1 through 1-TP12 were excavated using an excavator equipped with a 30-inch-wide bucket. The test pits extended to depths ranging from 6½ to 15 feet below the ground surface (bgs). An ENGEO geologist observed the excavation of the test pits and logged the soil conditions encountered. The logs depict subsurface conditions within the test pits at the time the exploration was conducted. Subsurface conditions at other locations may differ from conditions noted at these locations. The passage of time may result in altered subsurface conditions. In addition, stratification lines represent the approximate boundaries between soil types and the transitions may be gradual.

Laboratory Testing

Representative samples of on-site soils were selected for laboratory testing to determine the following soil characteristics:

Soil Characteristic	Test Method	Report Location
Natural Unit Weight and Moisture Content	ASTM D-2216	Boring Logs, Appendix A
Plasticity Index	ASTM D-4318	Appendix C
Unconfined Compression	ASTM D-2166	Appendix C

The laboratory test results are shown on the boring logs in Appendix A and individual test results are presented in Appendix C.

Subsurface Stratigraphy

In general, the subsurface conditions encountered in our borings consist of silty clays in the upper 10 to 20 feet, and generally reached claystone or siltstone bedrock at a depth of approximately 20 to 25 feet. Detailed boring logs can be found in Appendix A. Subsurface conditions encountered in the test pits indicated that there is four to five feet of colluvium covering portions of the site, but as deep as nine feet in 1-TP4 and as shallow as 1 foot in 1-TP8 through 1-TP10. The rock units encountered on-site consisted of the Markley Sandstone and the Nortonville Shale. These units were encountered at various depths ranging from 1 to 9 feet below the ground surface. Detailed test pit logs can be found in Appendix B.

Laboratory analysis of near-surface silty soil and claystone bedrock indicates that the Plasticity Indices (PI) range from 36 through 50. This suggests that the native bedrock and soils tested are highly plastic and have a high expansion potential.

Groundwater

Groundwater was only encountered in Boring 1-B5 at a depth of approximately 13 feet bgs (187 ft msl) during drilling. Groundwater was not encountered in any of the test pits. It should be noted that the borings may not have been left open for a sufficient period of time to establish equilibrium groundwater conditions. In addition, fluctuations in groundwater levels may occur seasonally and over a period of years because of precipitation, changes in drainage patterns, irrigation and other factors. Future irrigation may cause an overall rise in groundwater levels.

Landslides

Landslides are a primary geotechnical consideration for most of the East Bay Hills. Landslide deposits identified during this study were mapped using stereo-paired aerial photographs, and field checked during site reconnaissance and field explorations. During our field reconnaissance of the property, we encountered profiles of stiff to very stiff silty clays overlying sandstone and claystone bedrock in our test pits excavated in the possible landslide areas. With the exception of some isolated areas along Sand Creek, we did not identify hummocky, uneven terrain characteristic of landslide deposits across the majority of the site. Therefore, it is unlikely that the features initially suspected are landslides but more likely represent colluvial material. It is our opinion that landslides are unlikely to adversely impact the majority of the property.

Seismic Hazards

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking; ground lurching, soil liquefaction and lateral spreading. Based on topographic and lithologic data for this site, the risk of regional subsidence or uplift, landslides, tsunamis, and seiches is considered low to negligible at the site.

Ground Rupture. Because there are no known active faults crossing the property and the site is not located within an Alquist-Priolo Earthquake Fault Zone, it is our opinion that ground rupture is unlikely at the property.

Ground Shaking. An earthquake of moderate to high magnitude generated within the San Francisco Bay Region could cause considerable ground shaking at the site, similar to that which has occurred in the past. To mitigate the shaking effects, all structures should be designed using sound engineering judgment and the latest Uniform Building Code (UBC) requirements as a minimum.

Seismic design provisions of current building codes generally prescribe minimum lateral forces, applied statically to the structure, combined with the gravity forces of dead and live loads. The prescribed lateral forces are generally considered to be substantially smaller than the equivalent forces that would be associated with a major earthquake. Structures should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage, and (3) resist major earthquakes without collapse but with some structural as well as nonstructural damage. Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake; however, it is reasonable to expect that a well-designed and well-constructed structure will not collapse or cause loss of life in a major earthquake (SEAOC, 1996).

According to Petersen et al. (1997), the use of near source factors (N_a and N_v) for blind thrust faults such as the Great Valley fault, may overemphasize the seismic impact to the site. The Greenville fault was utilized as the seismic source to estimate near source factors and the resultant seismic coefficients. Based on the subsurface soil conditions encountered and local seismic sources, the site may be characterized for design based on Chapter 16 of the 1997 UBC using the following information:

Categorization/Coefficient	Design Value
Soil Profile Type (Table 16A-J)	S_D
Seismic Zone (Figure 16A-2)	4
Seismic Zone Factor (Table 16A-I)	0.4
Seismic Source Type (Table 16A-U)*	B
Near Source Factor N_a (Table 16A-S)	1.0
Near Source Factor N_v (Table 16A-T)	1.0
Seismic Coefficient C_a (Table 16A-Q)	0.44 N_a
Seismic Coefficient C_v (Table 16A-R)	0.64 N_v

*The Greenville fault is located approximately 9 km from the site.

Liquefaction. Liquefaction is a phenomenon in which saturated cohesionless soils have a temporary loss of strength due to cyclic stresses and increased pore pressure as a result of strong ground shaking caused by earthquakes. The common adverse effects of liquefaction may include settlement, loss of foundation support, ground surface rupture and sand boils, lateral spreading, instability of slopes and related effects. Soils most susceptible to liquefaction are clean, loose, uniformly graded and fine-grained granular soils.

The subsurface conditions encountered in the borings consisted primarily of silty clays, claystone and sandstone. Groundwater was encountered at one of borings, B-5, at depths of 13 feet bgs. Based on field exploratory data, estimated in place density and soil gradation, it is our opinion that liquefaction at the site is unlikely.

Lateral Spreading. Lateral spreading is a failure within a nearly horizontal soil zone, which causes the overlying soil mass to move down a gentle slope or toward a free face such as a creek or open body of water. Lateral spreading is most often associated with strength loss due to liquefaction. As described above, the liquefaction potential of the subsurface soils is considered low. The potential for lateral spreading to occur at the site during seismic shaking is also considered low because of the lack of potentially liquefiable soils.

Dynamic Densification Due to Earthquake Shaking. Densification of loose granular soils above the groundwater could cause settlement of the ground surface due to earthquake-induced vibrations. Loose granular soils located deeper than 2 feet below the existing ground surface were not encountered in our exploratory borings. Accordingly, considering that the upper 2 feet of the site will be re-worked as engineered fill, it is our opinion that the potential for dynamic densification is low.

Expansive Soils

The soils encountered across the site consisted of plastic silty clay deposits. These soils can be expected to display a high expansion potential. The potential impact of expansive soils can be mitigated through proper site grading and foundation design.

Corrosion Potential

An evaluation of possible corrosion impacts to site improvements has not been conducted on site soils because of the relatively large amount of proposed grading to bring the site to design grades. We recommend this testing be conducted after rough grading of the site. In lieu of performing chemical testing to assess the corrosion potential, concrete foundations can be designed considering the severe sulfate parameters as defined in the 1997 Uniform Building Code (UBC).

Slope Stability

The primary geologic conditions to potentially affect slope stability are colluvial deposits mapped in the project areas. Based on preliminary development plans, it appears that portions of the colluvial areas will be removed by design cut. To stabilize the slopes within the development areas, unstable colluvial material within the project limits should be completely removed, and site grades restored with properly drained engineered fill materials. The test pit logs depict the colluvial materials encountered during our field exploration.

Based on bedding attitudes encountered in test pits on the site, there appears to be a low potential for adverse bedding to occur on cut slopes. However, adverse bedding conditions were observed along portions of the banks of Sand Creek at the northern boundary of the project. Adverse bedding is considered to be an unstable bedrock slope condition, where beds dip out of the slope (e.g. at angles less than the designed slope angle) yet also dip at a high enough angle (generally greater than 8 degrees) to cause bedding contacts to represent unfavorable discontinuities (i.e. planes of weakness) and act as landslide slip surfaces that increase the likelihood of slope failure. Although test pit information indicates an overall low potential for adverse bedding, a Certified Engineering Geologist should observe exposed cut slopes on the site during excavation, and confirm that the slope be overexcavated and re-built as a buttress fill in areas where adverse bedding is encountered.

PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

It is our opinion, based on the exploration data and laboratory test results, that the project site is suitable for the proposed construction from a geotechnical standpoint. After confirmation with a design level geotechnical exploration, the recommendations included in this report, along with other sound engineering practices, should be incorporated in the design and construction of the project. The presence of expansive soils will be the greatest challenge at this site; however, expansive soils can be mitigated through placement of engineered fill and/or design considerations for improvements.

Grading

Based on a review of the provided preliminary site and grading plans, grading will involve cuts up to approximately 125 feet and fills up to approximately 20 feet. Grading operations, including the type and quality of the import fill if needed, should meet the requirements of the Guide Contract Specifications included in the Appendix D, and should be observed and tested by ENGEO's field representative. ENGEO must be notified a minimum 48 hours prior to grading in order to coordinate its schedule with the grading contractor.

Ponding of stormwater must not be allowed at the site, particularly on the building pads during work stoppage for rainy weather. Before the grading is halted by rain, positive slopes should be provided to carry surface runoff in a controlled manner to a discharge point approved by the Civil Engineer.

Demolition and Stripping

Site development will commence with the removal of fences surrounding the property and trees with accompanying root systems. Following the demolition of existing improvements, site development should include removal of vegetation, debris, loose soil and soft compressible materials in any location to be graded. As a minimum, tree roots should be removed at least 3 feet below the existing grades. The actual depth of tree root removal should be determined by the Geotechnical Engineer's representative during the time of grading.

Any soft compressible soils should be removed from areas to receive fill or structures, or those areas to serve as borrow. Subject to approval by the Landscape Architect, strippings and organically-contaminated soils can be used in landscape areas. Otherwise, such soils should be removed from the project site. Any topsoil that will be retained for future use in landscape areas should be stockpiled in areas where it will not interfere with grading operations.

All excavations from demolition and stripping below design grades should be cleaned to a firm, undisturbed soil or bedrock surface determined by the Geotechnical Engineer. This surface should then be scarified, moisture conditioned and backfilled with compacted engineered fill. The requirements for backfill materials and placement operations are the same as for engineered fill.

No loose or uncontrolled backfilling of depressions resulting from demolition and stripping is permitted.

Graded Slopes

Graded cut or fill slopes less than 10 feet in height should be graded no steeper than 2:1 (horizontal:vertical). Any slopes greater than 10 feet in height should be inclined no steeper than 3:1. All fill slopes should be adequately keyed into firm natural materials unaffected by shrinkage cracks.

Selection of Materials

With the exception of any organically contaminated materials (soil which contains more than 3 percent organics) or specifically required non-expansive fill, the site soils are suitable for use as engineered fill.

The Geotechnical Engineer should be informed when import materials are planned for the site. Import materials should be submitted and approved by the Geotechnical Engineer prior to delivery at the site and should conform to the requirements provided in Section 2.02B of Part I of the Guide Contract Specifications.

Creek Offset

As previously discussed, Sand Creek is located along portions of the northern property boundary and is characterized by locally over-steepened creek banks. Based on a review of historical aerial photographs, it appears that the alignment of Sand Creek has not significantly changed over the past 45 to 50 years. However, areas of localized instability were observed, as well as the existence of adverse bedding along portions of the creek banks. It is our opinion that the proposed development be appropriately offset from Sand Creek in the northern portion of the site. We recommend a preliminary creek set-back of 150 feet, or a 3:1 slope projected upward from the toe of the existing creek bank (whichever is less), be incorporated into the project planning.

Foundation Design

It is our opinion that a post-tension mat foundation system is appropriate for the proposed residential structures. Recommendations for design of this foundation system are provided in the following paragraphs. Structural mats may need to be stiffened to reduce differential movements from heaving or settlement to a value compatible with the proposed superstructure type and architectural finishes.

Post-tensioned mats should be designed according to methods recommended in the Post Tensioning Institute "Design and Construction of Post-Tensioned Slabs-on-ground, Second Edition", dated 1996.

Preliminary post-tensioned mat design parameters:

Center Lift Condition:	Edge Moisture Variation Distance, e_m= 5.0 feet Differential Soil Movement, y_m = 2.5 to 3.6 inches
Edge Lift Condition:	Edge Moisture Variation Distance, e_m = 4.0 feet Differential Soil Movement, y_m= 1.1 to 1.4 inch

Post-tensioned slabs should be designed for an average allowable soil pressure of 1,000 pounds per square foot (psf) or 1,500 psf for concentrated loads. These values may be increased by one-third when considering total loads, including wind or seismic loads.

Secondary Slab-on-Grade Construction

This section provides guidelines for secondary slabs such as patios, walkways, driveways and steps. Secondary slabs-on-grade should be constructed structurally independent of the foundation system. This allows slab movement to occur with a minimum of foundation distress. Where slab-on-grade construction is anticipated, care must be exercised in attaining a near-saturation condition of the subgrade soil before concrete placement.

Slabs-on-grade should be designed specifically for their intended use and loading requirements by the Structural Engineer. As mentioned previously, the site soils have very high expansion potential; therefore, cracking of conventional slabs should be expected in the future. To reduce and control cracking, slabs-on-grade should be reinforced with steel rebar and provided with frequent control joints. The actual reinforcement should be designed by the Structural Engineer and should, as a minimum, consist of No. 3 bars spaced 16 inches on-center each way. In our experience, welded wire mesh is not sufficient to control slab cracking.

Secondary slabs-on-grade should have a minimum thickness of 4 inches. A 4-inch-thick layer of clean crushed rock or gravel (Section 2.04, Part I of Guide Contract Specifications) should be placed under slabs. Exterior slabs should be constructed with thickened edges extending at least 6 inches into compacted soil to minimize water infiltration. Slabs should slope away from the buildings at a slope of at least 2 percent to prevent water from flowing toward the building. Frequent control joints should be provided to control the cracking.

Preliminary Pavement Design

Based on the field explorations and laboratory testing, we estimate that site soils will have an R-value of 5. The following preliminary pavement sections, for Traffic Indices of 4.5 to 9.5 and an assumed R-value of 5, have been provided. According to methods contained in Topic 608 of Highway Design Manual by CALTRANS and City of Antioch requirements, the following minimum asphaltic concrete pavement sections are recommended:

Traffic Index	Alternative I		Alternative II		
	AC (in.)	AB (in.)	AC (in.)	AB (in.)	ASB (in.)
4.5	2.5	10.0	2.5	6.0	5.0
5.0	3.0	12.0	3.0	6.0	7.0
6.0	3.5	14.0	3.5	8.0	7.0
7.0	4.0	16.0	4.0	9.0	8.0
8.0	5.0	18.0	5.0	11.0	9.0
9.5	6.0	22.0	6.0	13.0	11.0

Notes: AC is asphaltic concrete
AB is aggregate base Class 2 Material with minimum R = 78
ASB is asphalt stabilized base

The Traffic Index should be determined by the Civil Engineer or appropriate public agency. These sections are for estimating purposes only. Actual sections to be used should be based on R-value tests performed on samples of actual subgrade materials recovered at the time of grading.

Pavement materials and construction should comply with the specifications and requirements of the Standard Specifications by the State of California Division of Highways and City of Antioch requirements, and also meet the following minimum requirements.

- All pavement subgrades should be scarified to a depth of 12 inches below finished subgrade elevation, moisture conditioned to at least 2 percent above optimum moisture, and compacted to at least 90 percent relative compaction for clayey soils and 95 percent relative compaction for granular soils and in accordance with City requirements.
- Subgrade soils should be in a stable, non-pumping condition at the time aggregate base materials are placed and compacted.
- Adequate provisions must be made such that the subgrade soils and aggregate base materials are not allowed to become saturated.
- Aggregate Base material should meet current City requirements for Class 2 Aggregate Base, and should be compacted to at least 95 percent of maximum dry density.
- Asphalt paving materials should meet current Caltrans specifications for asphaltic concrete.
- All concrete curbs separating pavement and irrigated landscaped areas should extend into the subgrade and below the bottom of adjacent aggregate base materials.

<u>Future Geotechnical Studies</u>

As mentioned above, based on the preliminary exploration, it is our opinion that the proposed project is feasible from a geotechnical standpoint. Additional geotechnical and/or geologic design studies will be required to more fully develop design level recommendations. We recommend future studies include additional soil borings, test pits, laboratory testing, chemical testing for corrosivity, geologic mapping and fault trenching/evaluation.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report is issued with the understanding that it is the responsibility of the owner to transmit the information and recommendations of this report to developers, owners, buyers, architects, engineers, and designers for the project so that the necessary steps can be taken by the contractors and subcontractors to carry out such recommendations in the field. The conclusions and recommendations contained in this report are solely professional opinions.

The professional staff of ENGEO Incorporated strives to perform its services in a proper and professional manner with reasonable care and competence but is not infallible. There are risks of earth movement and property damages inherent in land development. We are unable to eliminate all risks or provide insurance; therefore, we are unable to guarantee or warrant the results of our work.

This report is based upon field and other conditions discovered at the time of preparation of ENGEO's work. This document must not be subject to unauthorized reuse, that is, reuse without written authorization of ENGEO. Such authorization is essential because it requires ENGEO to evaluate the document's applicability given new circumstances, not the least of which is passage of time. If actual field or other conditions necessitate clarifications, adjustments, modifications, or other changes to ENGEO's work, ENGEO must be engaged to prepare the necessary clarifications, adjustments, modifications, or other changes before construction activities commence or further activity proceeds. If ENGEO's scope of services does not include on-site construction observation, or if other persons or entities are retained to provide such services, ENGEO cannot be held responsible for any or all claims arising from or resulting from the performance of such services by other persons or entities, and from any or all claims arising from or resulting from clarifications, adjustments, modifications, discrepancies, or other changes necessary to reflect changed field or other conditions.

SELECTED REFERENCES

Blake, T. F., 1994, EQFAULT, A Computer Program for the Deterministic Prediction of Peak Horizontal Acceleration from Digitized California Faults.

California Department of Transportation, 1992, Highway Design Manual.

Dibblee, Thomas W. Preliminary Geologic Mapping of the Antioch-South Quadrangle, 1980.

ENGEO Inc., 2005, Phase I Environmental Site Assessment, Sullenger Ranch, Antioch, California, Project No. 6826.1.002.01.

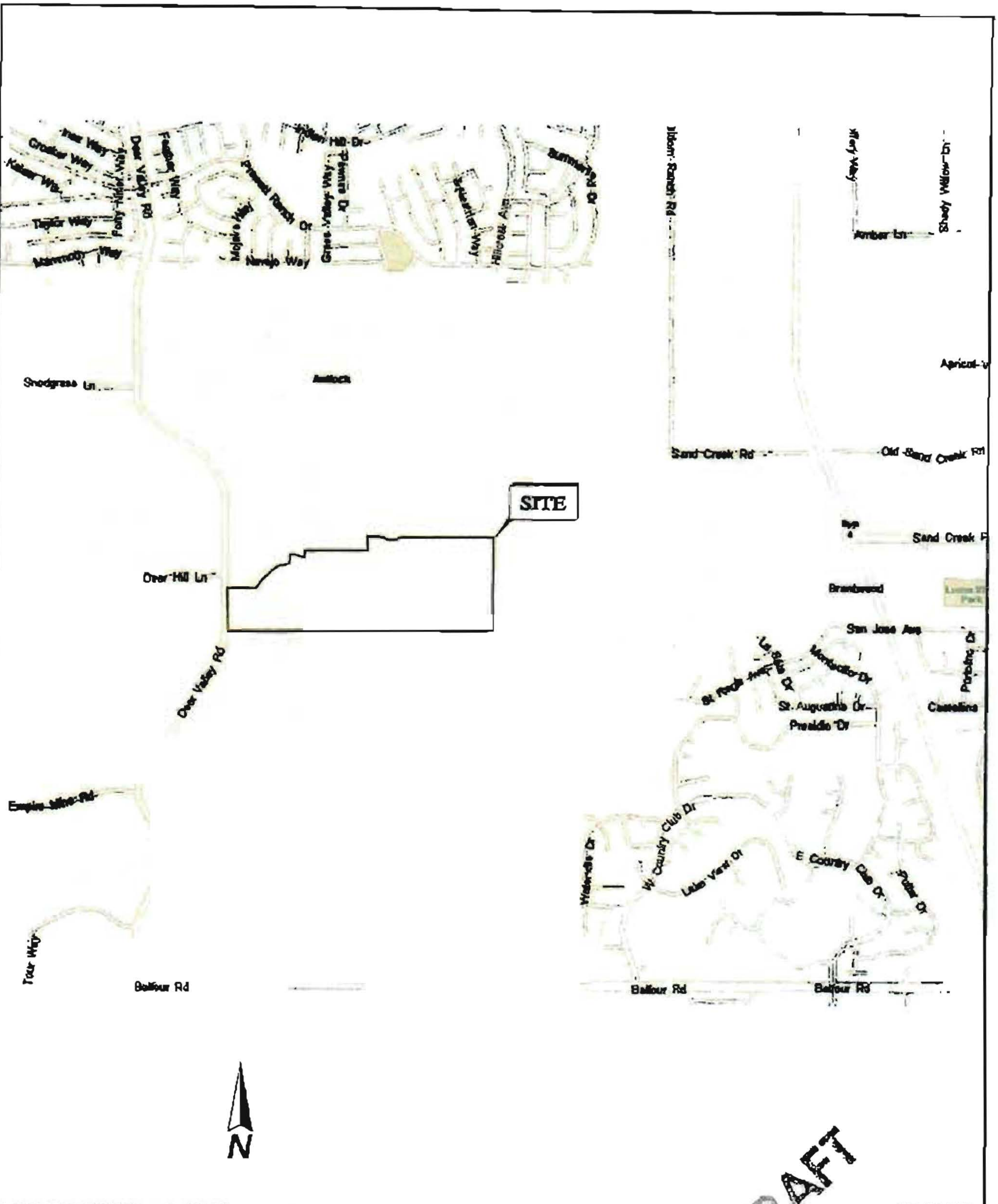
Idriss, I. M., 1994, Procedures for Selecting Earthquake Ground Motions at Rock Sites. National Institute of Standards and Technology, GCR 93-625.

International Conference of Building Officials, 1997, Uniform Building Code.

United States Department of Agriculture, Contra Costa County Soil Survey, 1977

Wentworth, C. M., R. S. Nicholson, H. M. Wright, and K. H. Brown, 2000, Preliminary Maps of Quaternary Deposits and Liquefaction Susceptibility, Nine-County San Francisco Bay Region, California: A Digital Database, USGS Open-File Report 00-444.

LIST OF FIGURES



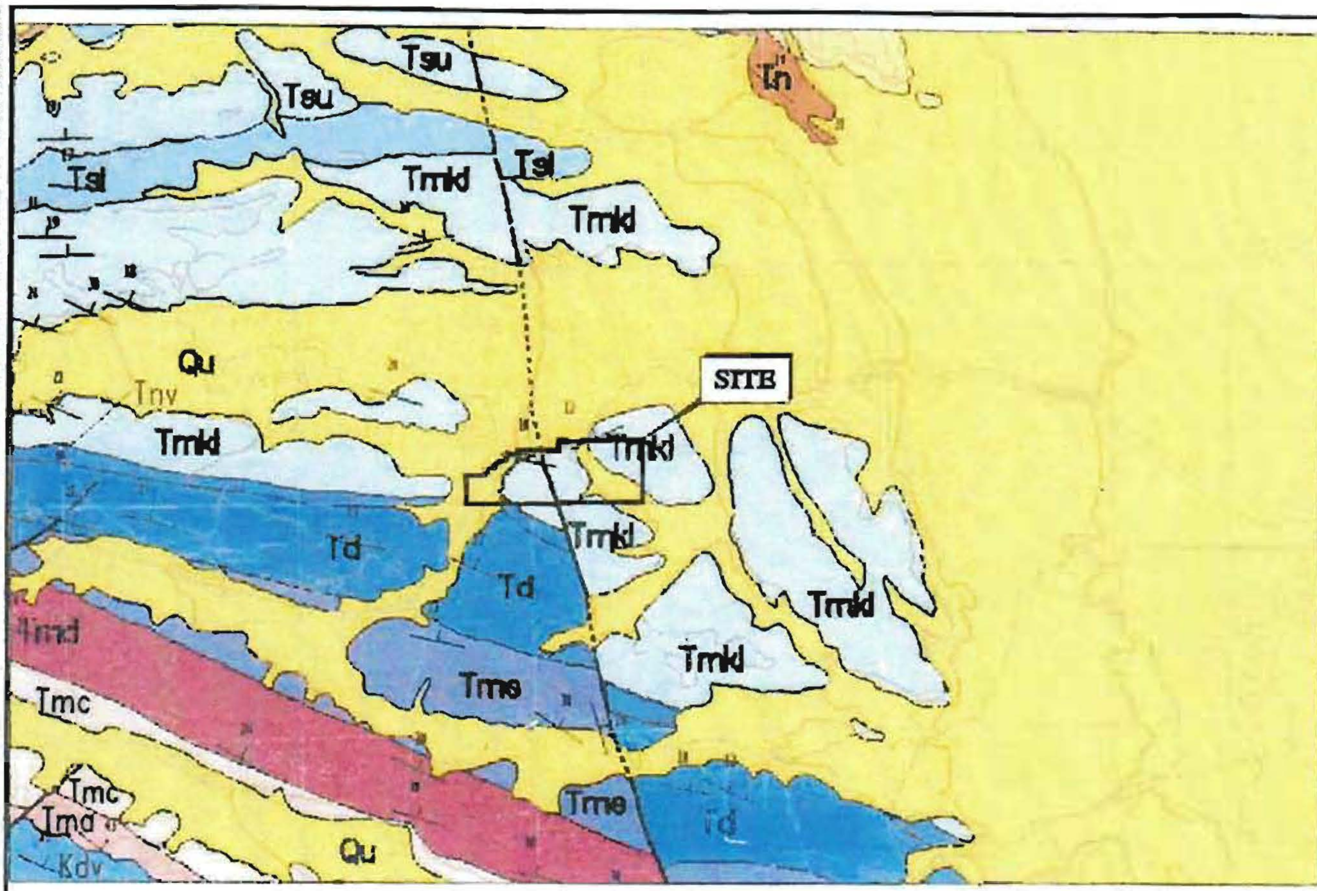
BASE MAP SOURCE: MS STREETS AND TRIPS

NO SCALE

DRAFT

ENGEO INCORPORATED EXCELLENT SERVICE SINCE 1971	SITE VICINITY MAP SULLENGER RANCH ANTIOCH, CALIFORNIA	PROJECT NO. 6826.1.001.01	FIGURE NO.
		DATE: JULY 2005	1
		DRAWN BY: PC / CHECKED BY: JT	

ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

Au	UNDIVIDED QUATERNARY DEPOSITS
Ttu	TULARE FORMATION
Tn	NEROLY SANDSTONE
Tsl	MARKLEY FORMATION - LOWER SIDNEY FLAT SHALE MEMBER
Tmkl	MARKLEY FORMATION - LOWER MEMBER
Tnv	NORTONVILLE SHALE
Td	DOMINGENE FORMATION
Tme	MEGANOS FORMATION - UPPER MEMBER
Tmd	MEGANOS FORMATION - SANDSTONE MEMBER
Tmc	MEGANOS FORMATION - SHALE MEMBER
Tma	MEGANOS FORMATION - LOWER MEMBER
Kdv	DEER VALLEY SANDSTONE OF COBURN
Keu	UPPER UNIT E - SILTSTONE
Kel	UPPER UNIT E - SANDSTONE
Kd	UNIT D - SANDSTONE
Kds	UNIT D - SHALE MEMBER

BEDROCK CONTACT-DASHED WHERE GRADATIONAL OR APPROXIMATELY LOCATED

FAULT-DASHED WHERE INFERRED, DOTTED WHERE CONCEALED, QUERIED WHERE EXISTENCE IS DOUBTFUL;

STRIKE AND DIP OF STRATA

INCLINED VERTICAL

N

0 FEET 4000

0 METERS 2000

DRAFT

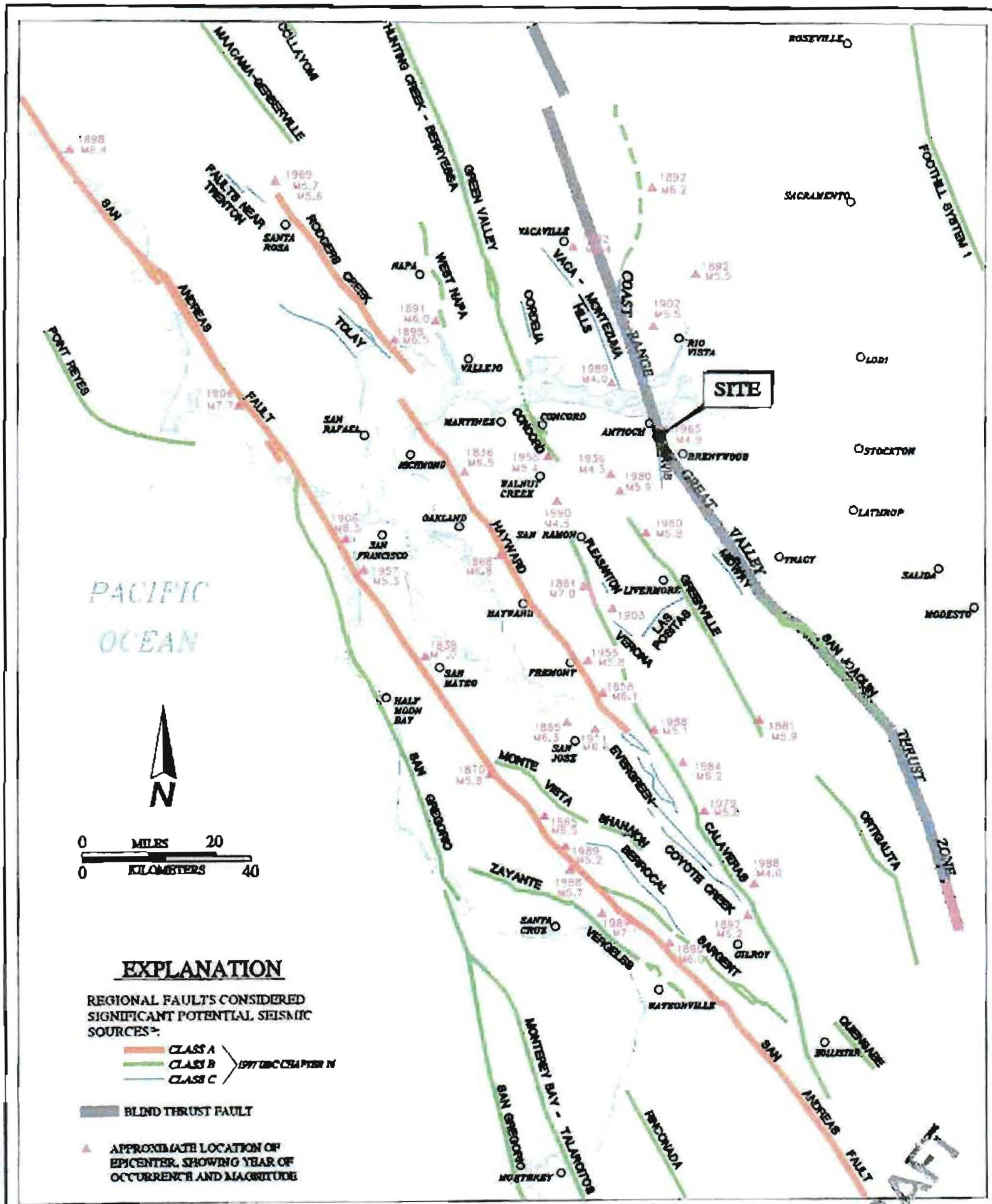
BASE MAP SOURCE: GRAYMER

ENGEO INCORPORATED
EXCELLENT SERVICE SINCE 1971

ORIGINAL FIGURE PRINTED IN COLOR

REGIONAL GEOLOGY MAP
SULLENGER RANCH
ANTIOCH, CALIFORNIA

PROJECT NO.: 6826.1.001.01		FIGURE NO. 3
DATE: JULY 2005		
DRAWN BY: PC	CHECKED BY: JT	



*BASED ON USGS OPEN FILE 96-706

ENGEO INCORPORATED EXCELLENT SERVICE SINCE 1971	REGIONAL FAULTING AND SEISMICITY SULLENGER RANCH ANTIOCH, CALIFORNIA	PROJECT NO.: 6826.1.001.01 DATE: JULY 2005 DRAWN BY: PC CHECKED BY: JT	FIGURE NO. 4

ORIGINAL FIGURE PRINTED IN COLOR

APPENDIX A

Boring Logs

6826.1.001.01
June 29, 2005

ENGEO INCORPORATED

LOG OF BORING B1

GEOTECHNICAL EXPLORATION
SULLENGER RANCH
ANTIOCH, CA
6826.1.001.01

DATE DRILLED: JUNE 21, 2005
HOLE DEPTH (FT): 21.0 ft.
HOLE DIAMETER: 4 in.
SURF ELEV (FT-MSL): 190 ft.

LOGGED / REVIEWED BY: K. ADAMS/ J.T.
DRILLING CONTRACTOR: WEST COAST
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140# w/rope and cat-head

Depth in Feet	Depth in Meters	Sample No.	Sample	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0			SILTY CLAY (CH), dark brown, some light grey/white mottling, hard, moist, some fine-grained sand.			87	18.4	105.8	*4.5+
5	1			(grades brownish orange)			57	32.5	864	*4.5+
	2			SANDSTONE, greyish tan w/ silver flecks, moist, friable, moderate weathering. (Harder Drilling @ 7.5')						
10	3						55/6"	18.8		*4.5+
15	4, 5			(grades tan/orange grey)			52/6"			*4.5+
20	6			CLAYSTONE, tan/orange, light grey mottling w/ silver flecks, friable, moderate weathering. (Harder Drilling @ 19')			60/6"			*4.5+
				Bottom of Boring at 21'.						
25, 30	7, 8, 9									

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CBG000041

ENGEO INCORPORATED

LOG OF BORING B2

GEOTECHNICAL EXPLORATION
SULLENGER RANCH
ANTIOCH, CA
6826.1.001.01

DATE DRILLED: JUNE 21, 2005
HOLE DEPTH (FT): 21.5 ft.
HOLE DIAMETER: 4 in.
SURF ELEV (FT-MSL): 173 ft.

LOGGED / REVIEWED BY: K. ADAMS/ J.T.
DRILLING CONTRACTOR: WEST COAST
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140# w/rope and cat-head

Depth in Feet	Depth in Meters	Sample No.	Sample	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0			SILTY CLAY (CH), dark brown, black and tan mottling, hard, moist.						
							64	11.7	110.9	*4.5+
5	1			(stiffer @ 4', grades w/trace fine- to medium-grained sand)						
	2						90	15.2	114.8	*4.5+
10	3						70			*4.5+
15	4			SANDY CLAY (CH), dark tan w/brown mottling, hard, moist, trace fine- to medium-grained sand.			73			*2.5
20	6			SILTY CLAY (CH), tan, stiff, moist, trace fine sand. LL=62, PI=47			25			*2.0
				Bottom of Boring at 21 1/2'.						
25	7, 8									
30	9									

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ENGEO INCORPORATED

LOG OF BORING B3

GEOTECHNICAL EXPLORATION
SULLENGER RANCH
ANTIOCH, CA
6826.1.001.01

DATE DRILLED: JUNE 21, 2005
HOLE DEPTH (FT): 30.5 ft
HOLE DIAMETER: 4 in.
SURF ELEV (FT-MSL): 183 ft.

LOGGED / REVIEWED BY: K. ADAMS/ J.T.
DRILLING CONTRACTOR: WEST COAST
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140# w/rope and cat-head

Depth in Feet	Depth in Meters	Sample No.	Sample	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0			SILTY CLAY (CH), dark brown, hard, moist, trace organics						
							60	13.6	109.7	10.7
5				SILTY CLAY (CL), brown, hard, moist, with fine- to coarse-grained sand, trace organics.			54	12.7	103.4	4.7
				(trace fine to coarse sub-angular gravel @ 7.5')						
10	3						80	23.4	101.9	*4.5+
15							82			*4.5+
	5			SANDY CLAY (CL), tan/grey, hard, moist, w/ silt. Harder drilling.						
20	6						84	24.7	100.9	*4.5+
				SILTY CLAY (CH), orange brown, grey and black mottling, trace fine-grained sand.						
25							50/4"			*4.5+
	8			(grades CL/CH with fine- to coarse-grained sand)						
				Harder drilling @ 28'.						
30	9			SILTSTONE, dark grey, friable, little weathering.			70/6"			*4.5+
				Bottom of Boring at 30 1/2'						

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ENGEO INCORPORATED

LOG OF BORING B4

GEOTECHNICAL EXPLORATION
SULLENGER RANCH
ANTIOCH, CA
6826.1.001.01

DATE DRILLED: JUNE 21, 2005
HOLE DEPTH (FT): 21.0 ft.
HOLE DIAMETER: 4 in.
SURF ELEV (FT-MSL): 250 ft.

LOGGED / REVIEWED BY: K. ADAMS/ J.T.
DRILLING CONTRACTOR: WEST COAST
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140# w/rope and cat-head

Depth in Feet	Depth in Meters	Sample No.	Sample	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0			SILTY CLAY (CH), dark brown, black and grey mottling, hard, moist, trace medium- to coarse-grained sand. LL=66, PI=50						
							59			*4.5+
	1			(drilling harder @ 3')						
5				(grades trace fine-grained sand)			81	16.9	108.4	*4.5+
	2									
				(Harder drilling @ 8')						
				(grades light brown)						
10	3						50/5.5"	19.2	107.7	*4.5+
	4			(harder drilling @ 13')						
15							50/5.5"			*4.5+
	5									
20	6			SILTY CLAY (CL), light brown w/ black and grey mottling, hard, moist, w/ fine- to coarse-grained sand.			55/6"			*4.5+
				Bottom of Boring at 21'.						
	7									
25	8									
30	9									

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ENGEO
INCORPORATED

LOG OF BORING B5

GEOTECHNICAL EXPLORATION SULLENGER RANCH ANTIOCH, CA 6826.1.001.01	DATE DRILLED: JUNE 21, 2005 HOLE DEPTH (FT): 21.5 ft. HOLE DIAMETER: 4 in. SURF ELEV (FT-MSL): 190 ft.	LOGGED / REVIEWED BY: K. ADAMS/ J.T. DRILLING CONTRACTOR: WEST COAST DRILLING METHOD: Solid Flight Auger HAMMER TYPE: 140# w/rope and cat-head

Depth in Feet	Depth in Meters	Sample No.	Sample	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0			SILTY CLAY (CL), dark brown, hard, trace medium to coarse grained sand, trace organics.						
							50	15.5	110.5	6.8
				(stiffer @ 3')						
	1									
5				(grades w/ fine- to coarse-grained sand)						
							68	21.2	99.4	*4.5+
	2									
10	3			(grades siff to very stiff, with trace fine-grained sand)						
							22	21.1	106.6	*2.5
	4									
15							21	21.5	105.3	*1.5
	5									
				(harder drilling @ 18')						
20	6			(wet @ 20')						
							34	18.7	105.5	*1.5
				Bottom of Boring at 21 1/2'.						
	7									
25										
	8									
	9									
30										

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ENGEO
INCORPORATED

APPENDIX B

Test Pit Logs

6826.1.001.01
June 29, 2005

SULLENGER RANCH
ANTIOCH, CALIFORNIA

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP-1	0 – 3	CLAY (CL-CH), dark brown, medium stiff to stiff, moist, 1-2" desiccation cracks at surface, colluvium.
	3 – 4.5	SILTY CLAY (CL), brown, stiff, moist, trace organics, colluvium.
	4.5 – 6	SANDSTONE, light yellowish brown, friable, thick bedding, highly weathered.
	6 – 6.5	CLAYSTONE, light brown, moist, interbed.
	6.5 – 8.5	SANDSTONE, light yellowish brown, moderately strong, thick to massive bedding, fine-grained sand, slightly weathered.
		Bottom of test pit at 8.5'. No groundwater encountered.
TP-2	0 – 4	CLAY (CL-CH), dark brown, stiff, moist, desiccation cracks at surface, colluvium.
	4 – 5	SILTY CLAY (CL), brown, stiff, moist, trace organics, colluvium.
	5 – 7	SANDSTONE, light brownish gray, friable, thick bedding, fine-grained sand.
	7 – 8	CLAYSTONE, grayish brown, moist, interbed.
	8 – 11	SANDSTONE, olive grayish brown, friable, thick bedding, moderate weathering.
		Bottom of test pit at 11'. No groundwater encountered.
TP-3	0 – 4	CLAY (CL-CH), dark brown, stiff, moist, colluvium.
	4 – 5	SILTY CLAY (CL), grayish brown, stiff to very stiff, moist, colluvium.
	5 – 6	CLAYSTONE, light gray, friable, very closely fractured, thin bedding, deep to moderate weathering.

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
	6 – 9	CLAYSTONE, gray, moderately strong, closely fractured, thick bedding, slightly weathered.
		Bottom of test pit at 9'. No groundwater encountered.
TP-4	0 – 9	CLAY (CL), dark brown, stiff to very stiff, moist, colluvium.
	9 – 12	CLAYSTONE, brownish gray, friable, closely to very closely fractured, thick bedding, moderate weathering.
		Bottom of test pit at 12'. No groundwater encountered.
TP-5	0 – 3	CLAY (CL), dark olive brown, stiff to very stiff, moist, colluvium.
	3 – 4	SANDSTONE, light olive brown, weak to friable, thin bedding, deep to moderate weathering, fine-grained sand.
	4 – 8	CLAYSTONE, olive grayish brown, friable, very closely fractured, thick bedding, moderate weathering.
		Bottom of test pit at 8'. No groundwater encountered.
TP-6	0 – 6	CLAY (CL), dark olive brown, stiff, moist, colluvium, 2-3" desiccation cracks at surface.
	6 – 8	CLAYSTONE, brown and white mottled, weak to friable, very closely fractured, thin bedding, deep to moderate weathering, calcium carbonate deposits within bedrock fractures.
	8 – 9	SANDSTONE, gray and white, friable, closely to very closely fractured, thin bedding, deep to moderate weathering.
	9 – 10	CLAYSTONE, olive gray and white, friable, closely fractured, thick bedding, moderate weathering.
		Bottom of test pit at 10'. No groundwater encountered.

SULLENGER RANCH
ANTIOCH, CALIFORNIA

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP-7	0 – 1.5	CLAY (CL), dark olive brown, stiff to very stiff, moist, colluvium, 3-6" fractures at surface.
	1.5 – 3.5	CLAYSTONE, brown and white mottled, friable, closely to very closely fractured, thin bedding, deep to moderate weathering.
	3.5 – 5	SANDSTONE, brownish gray, moderately strong, widely fractured, thin bedding, moderate weathering.
	5 – 8.5	CLAYSTONE, reddish brown, friable, very closely fractured, thick bedding,
		Bottom of test pit at 8.5'. No groundwater encountered.
TP-8	0 – 1	SILTY CLAY (CL), dark olive brown, stiff, moist, colluvium.
	1 – 4	SANDSTONE, very light brown, friable, closely fractured, thick bedding, deep weathering.
	4 – 8	SANDSTONE, light brown, moderately strong, widely fractured, very thick to massive bedding.
		Bottom of test pit at 10'. No groundwater encountered.
TP-9	0 – 1	SILTY CLAY (CL), olive brown, stiff, slightly moist, colluvium.
	1 – 3	SANDSTONE, light gray, friable, closely fractured, thick bedding, deep to moderate weathering.
	3 – 4	CLAYSTONE, light gray, friable, closely fractured, thin bedding, deep to moderate weathering.
	4 – 8	CLAYSTONE, gray and brown, stratified, friable to moderately strong, closely fractured, thin to very thin bedding, moderate weathering.
		Bottom of test pit at 8'. No groundwater encountered.

SULLENGER RANCH
ANTIOCH, CALIFORNIA

TEST PIT LOGS

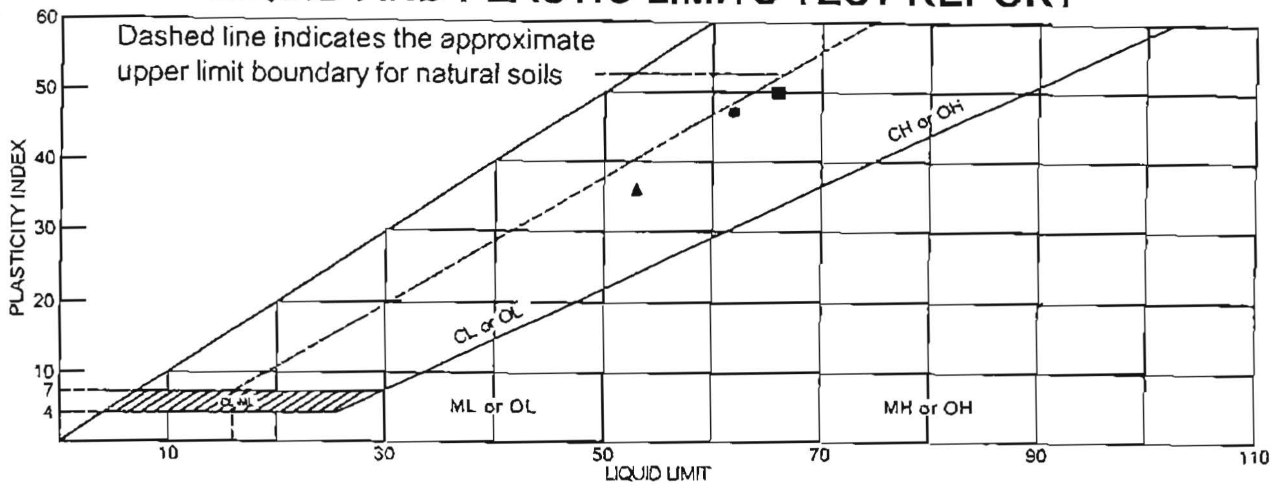
Test Pit Number	Depth (Feet)	Description
TP-10	0 – 1	CLAY (CL), olive brown, slightly moist, colluvium.
	1 – 8	SANDSTONE, light brown, moderately strong, very widely fractured, very thick bedding, moderate weathering.
	8 – 15	CLAYSTONE, gray and reddish brown, stratified, moderately strong, closely fractured, thin bedding, 6-12" sandstone interbeds.
		Bottom of test pit at 15'. No groundwater encountered.
TP-11	0 – 1.5	CLAY (CL), dark olive brown, stiff, moist, colluvium.
	1.5 – 4.5	SANDSTONE, light gray, friable, moderately fractured, thin bedding, moderate weathering.
	4.5 – 9	CLAYSTONE, olive gray and reddish brown, stratified, friable to moderately strong, moderately fractured, thin bedding, moderate weathering.
		Bottom of test pit at 9'. No groundwater encountered.
TP-12	0 – 4	CLAY (CL-CH), dark brown, stiff, moist, alluvium.
	4 – 6.5	SANDSTONE, Light grayish brown, friable, massive, moderate weathering.
		Bottom of test pit at 6.5'. No groundwater encountered.

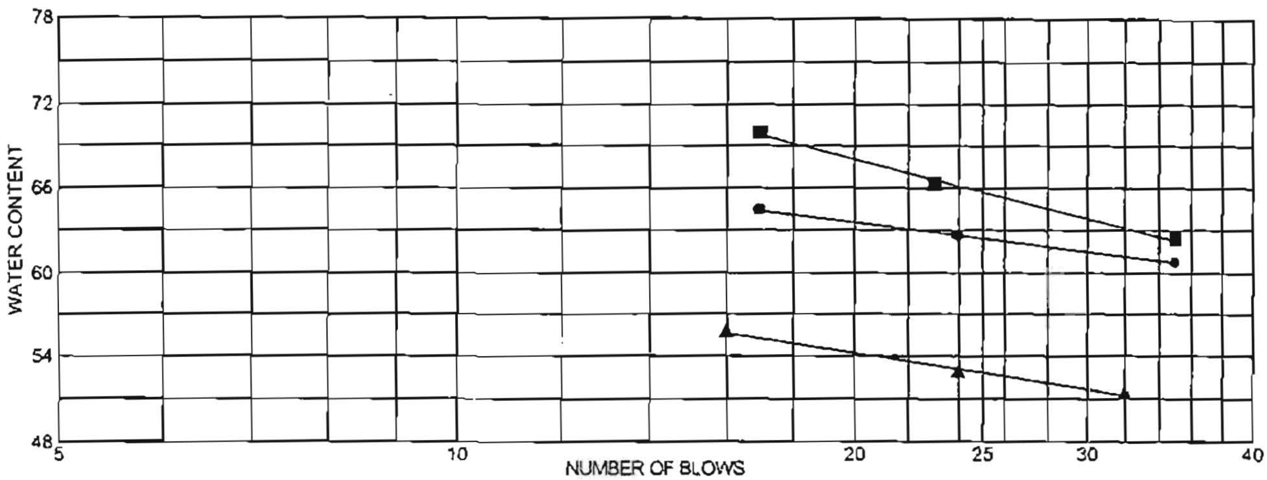
APPENDIX C

Laboratory Test Results

6826.1.001.01
June 29, 2005

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Light olive brown Clay. Trace sand.	62	15	47			CH
■	Olive brown Clay. Trace sand.	66	16	50			CH
▲	Very dark gray silty Clay to Clay with sand	53	17	36			CL-CH

Project No. 6826.1.001.01 **Client:**

Project: Sullinger Ranch, Deer Valley Road, Antioch CA

● **Source:** PI — **Sample No.:** 1-B2 @ 21'

■ **Source:** PI — **Sample No.:** 1-B4 @ 2'

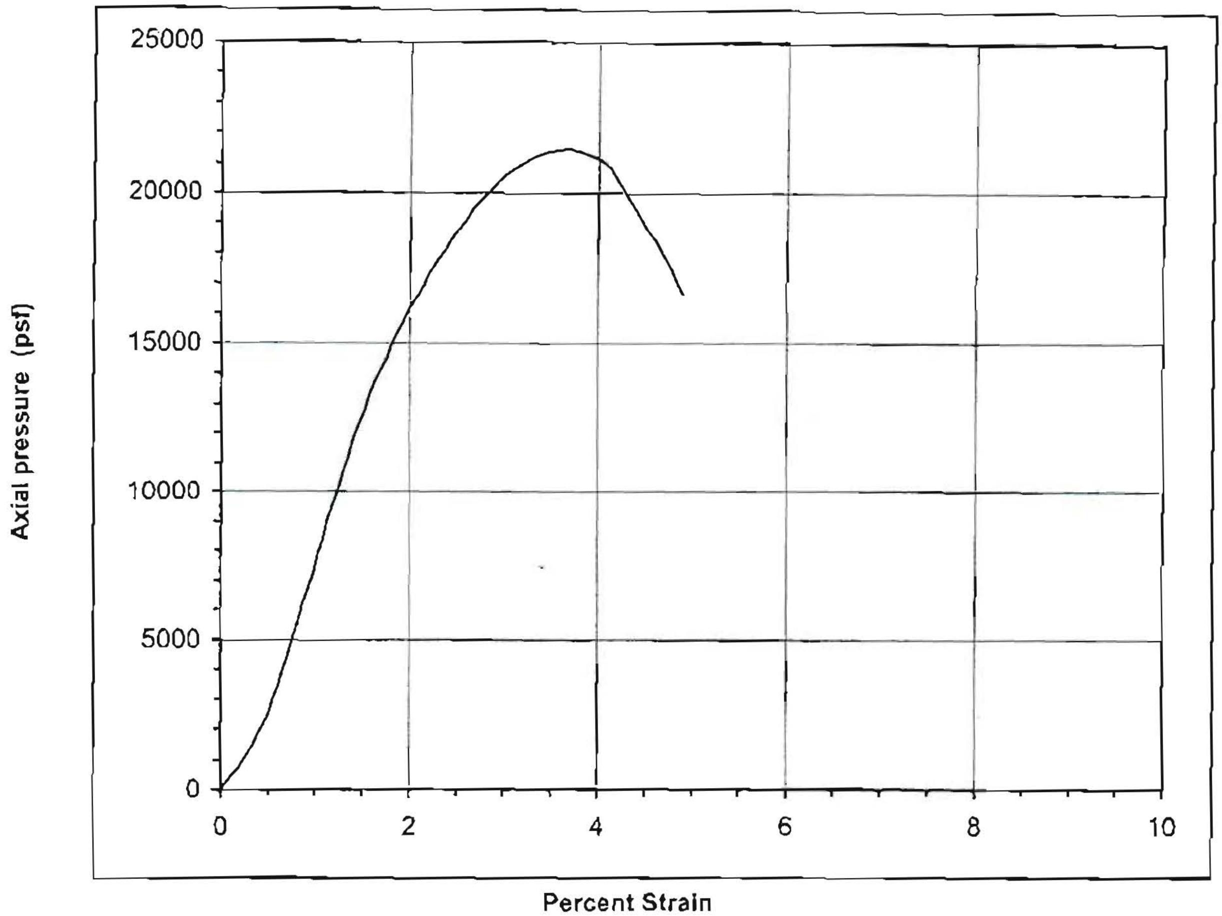
▲ **Source:** PI — **Sample No.:** 1-B3 @ 25'10"

Remarks:
● 1-B2 @ 21'
■ 1-B4 @ 2'
▲ 1-B3 @ 25'10"

ENGEO INCORPORATED
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS MATERIALS TESTING

Plate

Unconfined Compression Test
ASTM Test Method D2166



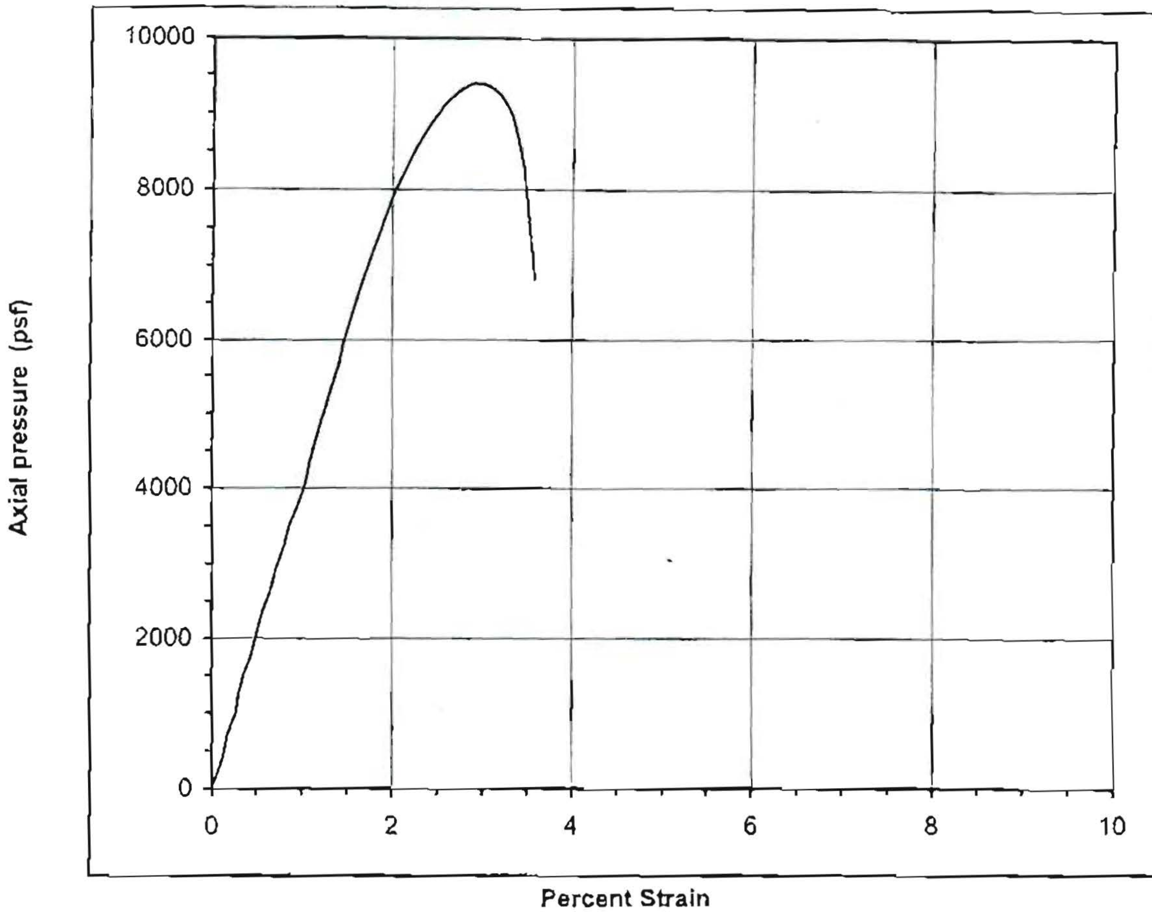
Unconfined Compressive Strength: 21420 psf 10.7 tsf

Sample Description: Very dark grayish brown silty Clay with sand

Initial Diameter:	2.420	in.	Sample Number:	1-B3 @2	
Initial Height:	5.00	in.	Dry Unit Weight:	109.7	pcf
Strain Rate:	1.710	%/min	Moisture Content:	13.5	%
Total Strain:	4.90	%	Depth of Sample:	2.0	ft.

ENGEO INCORPORATED	SULLENGER RANCH Antioch, California	Job No.:	6826.1.001.01	Figure No.
		Sample Number:	1-B3 @2	
		Date:	6/27/2005	

Unconfined Compression Test
ASTM Test Method D2166



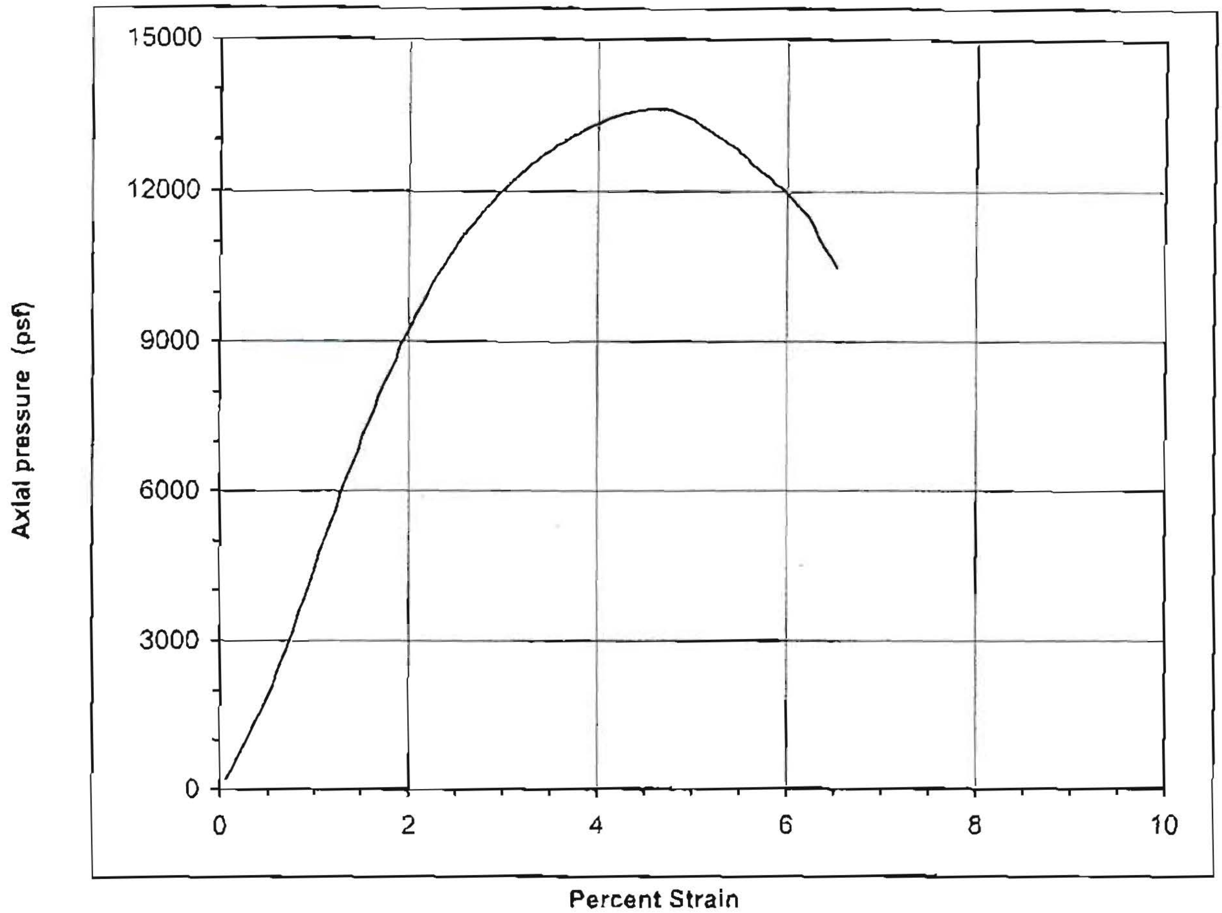
Unconfined Compressive Strength: 9380 psf 4.7 tsf

Sample Description: Olive brown clayey Sand

Initial Diameter:	2.420	in.	Sample Number:	1-B3@6	
Initial Height:	4.70	in.	Dry Unit Weight:	103.4	pcf
Strain Rate:	2.011	%/min	Moisture Content:	12.7	%
Total Strain:	3.59	%	Depth of Sample:	6.0	ft.

ENGEO INCORPORATED	SULLENGER RANCH Antioch, California	Job No.:	6826.1.001.01	Figure No.
		Sample Number:	1-B3@6	
		Date:	6/27/2005	

Unconfined Compression Test
ASTM Test Method D2166



Unconfined Compressive Strength:		13580 psf	6.8 tsf

Sample Description: Mottled dark grayish brown and olive brown Clay with sand

Initial Diameter:	2.420	in.	Sample Number:	1-B5@2	
Initial Height:	5.00	in.	Dry Unit Weight:	110.5	pcf
Strain Rate:	1.706	%/min	Moisture Content:	15.5	%
Total Strain:	6.53	%	Depth of Sample:	2.0	ft.

ENGEO INCORPORATED	SULLENGER RANCH Antioch, California	Job No.: 6826.1.001.01	Figure No.
		Sample Number: 1-B5@2	
		Date: 6/27/2005	

APPENDIX D

Guide Contract Specifications

6826.1.001.01
June 29, 2005

GUIDE CONTRACT SPECIFICATIONS

PART I - EARTHWORK

PREFACE

These specifications are intended as a guide for the earthwork performed at the subject development project. If there is a conflict between these specifications (including the recommendations of the geotechnical report) and agency or code requirements, it should be brought to the attention of ENGEO and Owner prior to contract bidding.

PART 1 - GENERAL

1.01 WORK COVERED

A. Grading, excavating, filling and backfilling, including trenching and backfilling for utilities as necessary to complete the Project as indicated on the Drawings.

B. Subsurface drainage as indicated on the Drawings.

1.02 CODES AND STANDARDS

A. Excavating, trenching, filling, backfilling, and grading work shall meet the applicable requirements of the Uniform Building Code and the standards and ordinances of state and local governing authorities.

1.03 SUBSURFACE SOIL CONDITIONS

A. The Owners' Geotechnical Exploration report is available for inspection by bidder or Contractor. The Contractor shall refer to the findings and recommendations of the Geotechnical Exploration report in planning and executing his work.

1.04 DEFINITIONS

A. Fill: All soil, rock, or soil-rock materials placed to raise the grades of the site or to backfill excavations.

B. Backfill: All soil, rock or soil-rock material used to fill excavations and trenches.

C. On-Site Material: Soil and/or rock material which is obtained from the site.

D. Imported Material: Soil and/or rock material which is brought to the site from off-site areas.

E. Select Material: On-site and/or imported material which is approved by ENGEO as a specific-purpose fill.

F. Engineered Fill: Fill upon which ENGEO has made sufficient observations and tests to confirm that the fill has been placed and compacted in accordance with specifications and requirements.

G. Degree of Compaction or Relative Compaction: The ratio, expressed as a percentage, of the in-place dry density of the fill and backfill material as compacted in the field to the maximum dry density of the same material as determined by ASTM D-1557 or California 216 compaction test method.

H. Optimum Moisture: Water content, percentage by dry weight, corresponding to the maximum dry density as determined by ASTM D-1557.

I. ENGEO: The project geotechnical engineering consulting firm, its employees or its designated representatives.

J. Drawings: All documents, approved for construction, which describe the Work.

1.05 OBSERVATION AND TESTING

A. All site preparation, cutting and shaping, excavating, filling, and backfilling shall be carried out under the observation of ENGEO, employed and paid for by the Owners. ENGEO will perform appropriate field and laboratory tests to evaluate the suitability of fill material, the proper moisture content for compaction, and the degree of compaction achieved. Any fill that does not meet the specification requirements shall be removed and/or reworked until the requirements are satisfied.

B. Cutting and shaping, excavating, conditioning, filling, and compacting procedures require approval of ENGEO as they are performed. Any work found unsatisfactory or any work disturbed by subsequent operations before approval is granted shall be corrected in an approved manner as recommended by ENGEO.

C. Tests for compaction will be made in accordance with test procedures outlined in ASTM D-1557, as applicable. Field testing of soils or compacted fill shall conform with the applicable requirements of ASTM D-2922.

D. All authorized observation and testing will be paid for by the Owners.

1.06 SITE CONDITIONS

A. Excavating, filling, backfilling, and grading work shall not be performed during unfavorable weather conditions. When the work is interrupted by rain, excavating, filling, backfilling, and grading work shall not be resumed until the site and soil conditions are suitable.

B. Contractor shall take the necessary measures to prevent erosion of freshly filled, backfilled, and graded areas until such time as permanent drainage and erosion control measures have been installed.

PART 2 - PRODUCTS

2.01 GENERAL

A. Contractor shall furnish all materials, tools, equipment, facilities, and services as required for performing the required excavating, filling, backfilling, and grading work, and trenching and backfilling for utilities.

2.02 SOIL MATERIALS

A. Fill

1. Material to be used for engineered fill and backfill shall be free from organic matter and other deleterious substances, and of such quality that it will compact thoroughly without excessive voids when watered and rolled. Excavated on-site material will be considered suitable for engineered fill and backfill if it contains no more than 3 percent organic matter, is free of debris and other deleterious substances and conforms to the requirements specified above. Rocks of maximum dimension in excess of two-thirds of the lift thickness shall be removed from any fill material to the satisfaction of ENGEO.

2. Excavated earth material which is suitable for engineered fill or backfill, as determined by ENGEO, shall be conditioned for reuse and properly stockpiled as required for later filling and backfilling operations. Conditioning shall consist of spreading material in layers not to exceed 8 inches and raking free of debris and rubble. Rocks and aggregate exceeding the allowed largest dimension, and deleterious material shall be removed from the site and disposed off site in a legal manner.

3. ENGEO shall be immediately notified if potential hazardous materials or suspect soils exhibiting staining or odor are encountered. Work activities shall be discontinued within the area of potentially hazardous materials. ENGEO environmental personnel will conduct an assessment of the suspect hazardous material to determine the appropriate response and mitigation. Regulatory agencies may also be contacted to request concurrence and oversight. *ENGEO will rely on the Owner, or a designated Owner's representative, to make necessary notices to the appropriate regulatory agencies. The Owner may request ENGEO's assistance in notifying regulatory agencies, provided ENGEO receives Owner's written authorization to expand its scope of services.*

4. ENGEO shall be notified at least 48 hours prior to the start of filling and backfilling operations so that it may evaluate samples of the material intended for use as fill and backfill. All materials to be used for filling and backfilling require the approval of ENGEO.

B. Import Material: Where conditions require the importation of fill material, the material shall be an inert, nonexpansive soil or soil-rock material free of organic matter and meeting the following requirements unless otherwise approved by ENGEO.

Gradation (ASTM D-421):	Sieve Size	Percent Passing
	2-inch	100
	#200	15 - 70
Plasticity (ASTM D-4318):	Liquid Limit	Plasticity Index
	< 30	< 12
Swell Potential (ASTM D-4546B): (at optimum moisture)	Percent Heave	Swell Pressure
	< 2 percent	< 300 psf
Resistance Value (ASTM D-2844):	Minimum 25	
Organic Content (ASTM D-2974):	Less than 2 percent	

A sample of the proposed import material should be submitted to ENGEO for evaluation prior to delivery at the site.

2.03 SAND

A. Sand for sand cushion under slabs and for bedding of pipe in utility trenches shall be a clean and graded, washed sand, free from clay or organic material, suitable for the intended purpose with 90 to 100 percent passing a No. 4 U.S. Standard Sieve, not more than 5 percent passing a No. 200 U.S. Standard Sieve, and generally conforming to ASTM C33 for fine aggregate.

2.04 AGGREGATE DRAINAGE FILL

A. Aggregate drainage fill under concrete slabs and paving shall consist of broken stone, crushed or uncrushed gravel, clean quarry waste, or a combination thereof. The aggregate shall be free from fines, vegetable matter, loam, volcanic tuff, and other deleterious substances. It shall be of such quality that the absorption of water in a saturated surface dry condition does not exceed 3 percent of the oven dry weight of the samples.

B. Aggregate drainage fill shall be of such size that the percentage composition by dry weight as determined by laboratory sieves (U. S. Series) will conform to the following grading:

Sieve Size	Percentage Passing Sieve
1½-inches	100
1-inch	90 - 100
#4	0 - 5

2.05 SUBDRAINS

A. Perforated subdrain pipe of the required diameter shall be installed as shown on the drawings. The pipe(s) shall also conform to these specifications unless otherwise specified by ENGEO in the field.

Subdrain pipe shall be manufactured in accordance with one of the following requirements:

Design depths less than 30 feet

- Perforated ABS Solid Wall SDR 35 (ASTM D-2751)
- Perforated PVC Solid Wall SDR 35 (ASTM D-3034)
- Perforated PVC A-2000 (ASTM F949)
- Perforated Corrugated HDPE double-wall (AASHTO M-252 or M-294, Caltrans Type S, 50 psi minimum stiffness)

Design depths less than 50 feet

- Perforated PVC SDR 23.5 Solid Wall (ASTM D-3034)
- Perforated Sch. 40 PVC Solid Wall (ASTM-1785)
- Perforated ABS SDR 23.5 Solid Wall (ASTM D-2751)
- Perforated ABS DWV/Sch. 40 (ASTM D-2661 and D-1527)
- Perforated Corrugated HDPE double-wall (AASHTO M-252 or M-294, Caltrans Type S, 70 psi minimum stiffness)

Design depths less than 70 feet

- Perforated ABS Solid Wall SDR 15.3 (ASTM D-2751)
- Perforated Sch. 80 PVC (ASTM D-1785)
- Perforated Corrugated Aluminum (ASTM B-745)

B. Permeable Material (Class 2): Class 2 permeable material for filling trenches under, around, and over subdrains, behind building and retaining walls, and for pervious blankets shall consist of clean, coarse sand and gravel or crushed stone, conforming to the following grading requirements:

Sieve Size	Percentage Passing Sieve
1-inch	100
¾-inch	90 - 100
3/8-inch	40 - 100
#4	25 - 40
#8	18 - 33
#30	5 - 15
#50	0 - 7
#200	0 - 3

C. Filter Fabric: All filter fabric shall meet the following Minimum Average Roll Values unless otherwise specified by ENGEO.

Grab Strength (ASTM D-4632)..180 lbs
Mass Per Unit Area (ASTM D-4751)..................................6 oz/yd^2
Apparent Opening Size (ASTM D-4751)............................70-100 U.S. Std. Sieve
Flow Rate (ASTM D-4491)80 gal/min/ft^2
Puncture Strength (ASTM D-4833)....................................80 lbs

D. Vapor Retarder: Vapor Retarders shall consist of PVC, LDPE or HDPE impermeable sheeting at least 10 mils thick..

2.06 PERMEABLE MATERIAL (Class 1; Type A)

A. Class 1 permeable material to be used in conjunction with filter fabric for backfilling of subdrain excavations shall conform to the following grading requirements:

Sieve Size	Percentage Passing Sieve
¾-inch	100
½-inch	95 - 100
3/8-inch	70 - 100
#4	0 - 55
#8	0 - 10
#200	0 - 3

PART 3 - EXECUTION

3.01 STAKING AND GRADES

A. Contractor shall lay out all his work, establish all necessary markers, bench marks, grading stakes, and other stakes as required to achieve design grades.

3.02 EXISTING UTILITIES

A. Contractor shall verify the location and depth (elevation) of all existing utilities and services before performing any excavation work.

3.03 EXCAVATION

A. Contractor shall perform excavating as indicated and required for concrete footings, drilled piers, foundations, floor slabs, concrete walks, and site leveling and grading, and provide shoring, bracing, underpinning, cribbing, pumping, and planking as required. The bottoms of excavations shall be firm undisturbed earth, clean and free from loose material, debris, and foreign matter.

B. Excavations shall be kept free from water at all times. Adequate dewatering equipment shall be maintained at the site to handle emergency situations until concrete or backfill is placed.

C. Unauthorized excavations for footings shall be filled with concrete to required elevations, unless other methods of filling are authorized by ENGEO.

D. Excavated earth material which is suitable for engineered fill or backfill, as determined by ENGEO, shall be conditioned for reuse and properly stockpiled for later filling and backfilling operations as specified under Section 2.02, "Soil Materials."

E. Abandoned sewers, piping, and other utilities encountered during excavating shall be removed and the resulting excavations shall be backfilled with engineered fill as required by ENGEO.

F. Any active utility lines encountered shall be reported immediately to the Owner's Representative and authorities involved. The Owner and proper authorities shall be permitted free access to take the measures deemed necessary to repair, relocate, or remove the obstruction as determined by the responsible authority or Owner's Representative.

3.04 SUBGRADE PREPARATION

A. All brush and other rubbish, as well as trees and root systems not marked for saving, shall be removed from the site and legally disposed of.

B. Any existing structures, foundations, underground storage tanks, or debris must be removed from the site prior to any building, grading, or fill operations. Septic tanks, including all drain fields and other lines, if encountered, must be totally removed. The resulting depressions shall be properly prepared and filled to the satisfaction of ENGEO.

C. Vegetation and organic topsoil shall be removed from the surface upon which the fill is to be placed and either removed and legally disposed of or stockpiled for later use in approved landscape areas. The surface shall then be scarified to a depth of at least eight inches until the surface is free from ruts, hummocks, or other uneven features which would tend to prevent uniform compaction by the equipment to be used.

D. After the foundation for the fill has been cleared and scarified, it shall be made uniform and free from large clods. The proper moisture content must be obtained by adding water or aerating. The foundation for the fill shall be compacted at the proper moisture content to a relative compaction as specified herein.

3.05 ENGINEERED FILL

A. Select Material: Fill material shall be "Select" or "Imported Material" as previously specified.

B. Placing and Compacting: Engineered fill shall be constructed by approved and accepted methods. Fill material shall be spread in uniform lifts not exceeding 8 inches in uncompacted thickness. Each layer shall be spread evenly, and thoroughly blade-mixed to obtain uniformity of material. Fill material which does not contain sufficient moisture as specified by ENGEO shall be sprinkled with water; if it contains excess moisture it shall be aerated or blended with drier material to achieve the proper water content. Select material and water shall then be thoroughly mixed before being compacted.

C. Unless otherwise specified in the Geotechnical Exploration report, each layer of spread select material shall be compacted to at least 90 percent relative compaction at a moisture content of at least three percent above the optimum moisture content. Minimum compaction in all keyways shall be a minimum of 95 percent with a minimum moisture content of at least 1 percentage point above optimum.

D. Unless otherwise specified in the Geotechnical Exploration report or otherwise required by the local authorities, the upper 6 inches of engineered fill in areas to receive pavement shall be compacted to at least 95 percent relative compaction with a minimum moisture content of at least 3 percentage points above optimum.

E. Testing and Observation of Fill: The work shall consist of field observation and testing to determine that each layer has been compacted to the required density and that the required moisture is being obtained. Any layer or portion of a layer that does not attain the compaction required shall be reworked until the required density is obtained.

F. Compaction: Compaction shall be by sheepsfoot rollers, multiple-wheel steel or pneumatic-tired rollers or other types of acceptable compaction equipment. Rollers shall be of such design that they will be able to compact the fill to the specified compaction. Rolling shall be accomplished while the fill material is within the specified moisture content range. Rolling of each layer must be continuous so that the required compaction may be obtained uniformly throughout each layer.

G. Fill slopes shall be constructed by overfilling the design slopes and later cutting back the slopes to the design grades. No loose soil will be permitted on the faces of the finished slopes.

H. Strippings and topsoil shall be stockpiled as approved by Owner, then placed in accordance with ENGEO's recommendations to a minimum thickness of 6 inches and a maximum thickness of 12 inches over exposed open space cut slopes which are 3:1 or flatter, and track walked to the satisfaction of ENGEO.

I. Final Prepared Subgrade: Finish blading and smoothing shall be performed as necessary to produce the required density, with a uniform surface, smooth and true to grade.

3.06 BACKFILLING

A. Backfill shall not be placed against footings, building walls, or other structures until approved by ENGEO.

B. Backfill material shall be Select Material as specified for engineered fill.

C. Backfill shall be placed in 6-inch layers, leveled, rammed, and tamped in place. Each layer shall be compacted with suitable compaction equipment to 90 percent relative compaction at a moisture content of at least 3 percent above optimum.

3.07 TRENCHING AND BACKFILLING FOR UTILITIES

A. Trenching:

1. Trenching shall include the removal of material and obstructions, the installation and removal of sheeting and bracing and the control of water as necessary to provide the required utilities and services.

2. Trenches shall be excavated to the lines, grades, and dimensions indicated on the Drawings. Maximum allowable trench width shall be the outside diameter of the pipe plus 24 inches, inclusive of any trench bracing.

3. When the trench bottom is a soft or unstable material as determined by ENGEO, it shall be made firm and solid by removing said unstable material to a sufficient depth and replacing it with on-site material compacted to 90 percent minimum relative compaction.

4. Where water is encountered in the trench, the contractor must provide materials necessary to drain the water and stabilize the bed.

B. Backfilling:

1. Trenches must be backfilled within 2 days of excavation to minimize desiccation.

2. Bedding material shall be sand and shall not extend more than 6 inches above any utility lines.

3. Backfill material shall be select material.

4. Trenches shall be backfilled as indicated or required and compacted with suitable equipment to 90 percent minimum relative compaction at the required moisture content.

3.08 SUBDRAINS

A. Trenches for subdrain pipe shall be excavated to a minimum width equal to the outside diameter of the pipe plus at least 12 inches and to a depth of approximately 2 inches below the grade established for the invert of the pipe, or as indicated on the Drawings.

B. The space below the pipe invert shall be filled with a layer of Class 2 permeable material, upon which the pipe shall be laid with perforations down. Sections shall be joined as recommended by the pipe manufacturer.

C. Rocks, bricks, broken concrete, or other hard material shall not be used to give intermediate support to pipes. Large stones or other hard objects shall not be left in contact with the pipes.

D. Excavations for subdrains shall be filled as required to fill voids and prevent settlement without damaging the subdrain pipe. Alternatively, excavations for subdrains may be filled with Class 1 permeable material (as defined in Section 2.06) wrapped in Filter Fabric (as defined in Section 2.05).

3.09 AGGREGATE DRAINAGE FILL

A. ENGEO shall approve finished subgrades before aggregate drainage fill is installed.

B. Pipes, drains, conduits, and any other mechanical or electrical installations shall be in place before any aggregate drainage fill is placed. Backfill at walls to elevation of drainage fill shall be in place and compacted.

C. Aggregate drainage fill under slabs and concrete paving shall be the minimum uniform thickness after compaction of dimensions indicated on Drawings. Where not indicated, minimum thickness after compaction shall be 4 inches.

D. Aggregate drainage fill shall be rolled to form a well-compacted bed.

E. The finished aggregate drainage fill must be observed and approved by ENGEO before proceeding with any subsequent construction over the compacted base or fill.

3.10 SAND CUSHION

A. A sand cushion shall be placed over the vapor retarder membrane under concrete slabs on grade. Sand cushion shall be placed in uniform thickness as indicated on the Drawings. Where not indicated, the thickness shall be 2 inches.

3.11 FINISH GRADING

A. All areas must be finish graded to elevations and grades indicated on the Drawings. In areas to receive topsoil and landscape planting, finish grading shall be performed to a uniform 6 inches below the grades and elevations indicated on the Drawings, and brought to final grade with topsoil.

3.12 DISPOSAL OF WASTE MATERIALS

A. Excess earth materials and debris shall be removed from the site and disposed of in a legal manner. Location of dump site and length of haul are the Contractor's responsibility.

PART II - GEOGRID SOIL REINFORCEMENT

1. DESCRIPTION:

Work shall consist of furnishing geogrid soil reinforcement for use in construction of reinforced soil slopes and retention systems.

2. GEOGRID MATERIAL:

2.1 The specific geogrid material shall be preapproved by ENGEO.

2.2 The geogrid shall be a regular network of integrally connected polymer tensile elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil or rock. The geogrid structure shall be dimensionally stable and able to retain its geometry under construction stresses and shall have high resistance to damage during construction, to ultraviolet degradation, and to all forms of chemical and biological degradation encountered in the soil being reinforced.

2.3 The geogrids shall have an Allowable Strength (T_a) and Pullout Resistance, for the soil type(s) indicated, as listed in Table I.

2.4 Certifications: The Contractor shall submit a manufacturer's certification that the geogrids supplied meet the respective index criteria set when geogrid was approved by ENGEO, measured in full accordance with all test methods and standards specified. In case of dispute over validity of values, the Contractor will supply test data from an ENGEO-approved laboratory to support the certified values submitted.

3. CONSTRUCTION:

3.1 Delivery, Storage, and Handling: Contractor shall check the geogrid upon delivery to ensure that the proper material has been received. During all periods of shipment and storage, the geogrid shall be protected from temperatures greater than 140 °F, mud, dirt, dust, and debris. Manufacturer's recommendations in regard to protection from direct sunlight must also be followed. At the time of installation, the geogrid will be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. If approved by ENGEO, torn or punctured sections may be repaired by placing a patch over the damaged area. Any geogrid damaged during storage or installation shall be replaced by the Contractor at no additional cost to the owner.

3.2 On-Site Representative: Geogrid material suppliers shall provide a qualified and experienced representative on site at the initiation of the project, for a minimum of three days, to assist the Contractor and ENGEO personnel at the start of construction. If there is more than one slope on a project, this criterion will apply to construction of the initial slope only. The representative shall also be available on an as-needed basis, as requested by ENGEO, during construction of the remaining slope(s).

3.3 Geogrid reinforcement may be joined with mechanical connections or overlaps as recommended and approved by the Manufacturer. Joints shall not be placed within 6 feet of the slope face, within 4 feet below top of slope, nor horizontally or vertically adjacent to another joint.

3.4 Geogrid Placement: The geogrid reinforcement shall be installed in accordance with the manufacturer's recommendations. The geogrid reinforcement shall be placed within the layers of the compacted soil as shown on the plans or as directed.

The geogrid reinforcement shall be placed in continuous longitudinal strips in the direction of main reinforcement. However, if the Contractor is unable to complete a required length with a single continuous length of geogrid, a joint may be made with the Manufacturer's approval. Only one joint per length of geogrid shall be allowed. This joint shall be made for the full width of the strip by using a similar material with similar strength. Joints in geogrid reinforcement shall be pulled and held taut during fill placement.

Adjacent strips, in the case of 100 percent coverage in plan view, need not be overlapped. The minimum horizontal coverage is 50 percent, with horizontal spacings between reinforcement no greater than 40 inches. Horizontal coverage of less than 100 percent shall not be allowed unless specifically detailed in the construction drawings.

Adjacent rolls of geogrid reinforcement shall be overlapped or mechanically connected where exposed in a wrap around face system, as applicable.

The Contractor may place only that amount of geogrid reinforcement required for immediately pending work to prevent undue damage. After a layer of geogrid reinforcement has been placed, the next succeeding layer of soil shall be placed and compacted as appropriate. After the specified soil layer has been placed, the next geogrid reinforcement layer shall be installed. The process shall be repeated for each subsequent layer of geogrid reinforcement and soil.

Geogrid reinforcement shall be placed to lay flat and pulled tight prior to backfilling. After a layer of geogrid reinforcement has been placed, suitable means, such as pins or small piles of soil, shall be used to hold the geogrid reinforcement in position until the subsequent soil layer can be placed.

Under no circumstances shall a track-type vehicle be allowed on the geogrid reinforcement before at least six inches of soil have been placed. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and the geogrid reinforcement. If approved by the Manufacturer, rubber-tired equipment may pass over the geosynthetic reinforcement at slow speeds, less than 10 mph. Sudden braking and sharp turning shall be avoided.

During construction, the surface of the fill should be kept approximately horizontal. Geogrid reinforcement shall be placed directly on the compacted horizontal fill surface. Geogrid reinforcements are to be placed within three inches of the design elevations and extend the length as shown on the elevation view unless otherwise directed by ENGEO. Correct orientation of the geogrid reinforcement shall be verified by ENGEO.

Table I
Allowable Geogrid Strength
With Various Soil Types
For Geosynthetic Reinforcement In
Mechanically Stabilized Earth Slopes

(Geogrid Pullout Resistance and Allowable Strengths vary with reinforced backfill used due to soil anchorage and site damage factors. Guidelines are provided below.)

SOIL TYPE		MINIMUM ALLOWABLE STRENGTH, T_a (lb/ft)*		
		GEOGRID Type I	GEOGRID Type II	GEOGRID Type III
A.	Gravels, sandy gravels, and gravel-sand-silt mixtures (GW, GP, GC, GM & SP)**	2400	4800	7200
B.	Well graded sands, gravelly sands, and sand-silt mixtures (SW & SM)**	2000	4000	6000
C.	Silts, very fine sands, clayey sands and clayey silts (SC & ML)**	1000	2000	3000
D.	Gravelly clays, sandy clays, silty clays, and lean clays (CL)**	1600	3200	4800

* All partial Factors of Safety for reduction of design strength are included in listed values. Additional factors of safety may be required to further reduce these design strengths based on site conditions.

** Unified Soil Classifications.

PART III - GEOTEXTILE SOIL REINFORCEMENT

1. DESCRIPTION:

Work shall consist of furnishing geotextile soil reinforcement for use in construction of reinforced soil slopes.

2. GEOTEXTILE MATERIAL:

2.1 The specific geotextile material and supplier shall be preapproved by ENGEO.

2.2 The geotextile shall have a high tensile modulus and shall have high resistance to damage during construction, to ultraviolet degradation, and to all forms of chemical and biological degradation encountered in the soil being reinforced.

2.3 The geotextiles shall have an Allowable Strength (T_a) and Pullout Resistance, for the soil type(s) indicated as listed in Table II.

2.4 Certification: The Contractor shall submit a manufacturer's certification that the geotextiles supplied meet the respective index criteria set when geotextile was approved by ENGEO, measured in full accordance with all test methods and standards specified. In case of dispute over validity of values, the Contractor will supply the data from an ENGEO-approved laboratory to support the certified values submitted.

3. CONSTRUCTION:

3.1 Delivery, Storage and Handling: Contractor shall check the geotextile upon delivery to ensure that the proper material has been received. During all periods of shipment and storage, the geotextile shall be protected from temperatures greater than 140 °F, mud, dirt, dust, and debris. Manufacturer's recommendations in regard to protection from direct sunlight must also be followed. At the time of installation, the geotextile will be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. If approved by ENGEO, torn or punctured sections may be repaired by placing a patch over the damaged area. Any geotextile damaged during storage or installation shall be replaced by the Contractor at no additional cost to the owner.

3.2 On-Site Representative: Geotextile material suppliers shall provide a qualified and experienced representative on site at the initiation of the project, for a minimum of three days, to assist the Contractor and ENGEO personnel at the start of construction. If there is more than one slope on a project, this criterion will apply to construction of the initial slope only. The representative shall also be available on an as-needed basis, as requested by ENGEO, during construction of the remaining slope(s).

3.3 Geotextile Placement: The geotextile reinforcement shall be installed in accordance with the manufacturer's recommendations. The geotextile reinforcement shall be placed within the layers of the compacted soil as shown on the plans or as directed.

The geotextile reinforcement shall be placed in continuous longitudinal strips in the direction of main reinforcement. Joints shall not be used with geotextiles.

Adjacent strips, in the case of 100 percent coverage in plan view, need not be overlapped. The minimum horizontal coverage is 50 percent, with horizontal spacings between reinforcement no greater than 40 inches. Horizontal coverage of less than 100 percent shall not be allowed unless specifically detailed in the construction drawings.

Adjacent rolls of geotextile reinforcement shall be overlapped or mechanically connected where exposed in a wrap around face system, as applicable.

The Contractor may place only that amount of geotextile reinforcement required for immediately pending work to prevent undue damage. After a layer of geotextile reinforcement has been placed, the succeeding layer of soil shall be placed and compacted as appropriate. After the specified soil layer has been placed, the next geotextile reinforcement layer shall be installed. The process shall be repeated for each subsequent layer of geotextile reinforcement and soil.

Geosynthetic reinforcement shall be placed to lay flat and be pulled tight prior to backfilling. After a layer of geotextile reinforcement has been placed, suitable means, such as pins or small piles of soil, shall be used to hold the geotextile reinforcement in position until the subsequent soil layer can be placed.

Under no circumstances shall a track-type vehicle be allowed on the geotextile reinforcement before at least six inches of soil has been placed. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and the geotextile reinforcement. If approved by the Manufacturer, rubber-tired equipment may pass over the geotextile reinforcement as slow speeds, less than 10 mph. Sudden braking and sharp turning shall be avoided.

During construction, the surface of the fill should be kept approximately horizontal. Geotextile reinforcement shall be placed directly on the compacted horizontal fill surface. Geotextile reinforcements are to be placed within three inches of the design elevations and extend the length as shown on the elevation view unless otherwise directed by ENGEO. Correct orientation of the geotextile reinforcement shall be verified by ENGEO.

Table II
Allowable Geotextile Strength
With Various Soil Types
For Geosynthetic Reinforcement In
Mechanically Stabilized Earth Slopes

(Geotextile Pullout Resistance and Allowable Strengths vary with reinforced backfill used due to soil anchorage and site damage factors. Guidelines are provided below.)

SOIL TYPE	MINIMUM ALLOWABLE STRENGTH, T_a (lb/ft)*		
	GEOTEXTILE Type I	GEOTEXTILE Type II	GEOTEXTILE Type III
A. Gravels, sandy gravels, and gravel-sand-silt mixtures (GW, GP, GC, GM & SP)**	2400	4800	7200
B. Well graded sands, gravelly sands, and sand-silt mixtures (SW & SM)**	2000	4000	6000
C. Silts, very fine sands, clayey sands and clayey silts (SC & ML)**	1000	2000	3000
D. Gravelly clays, sandy clays, silty clays, and lean clays (CL)**	1600	3200	4800

* All partial Factors of Safety for reduction of design strength are included in listed values. Additional factors of safety may be required to further reduce these design strengths based on site conditions.

** Unified Soil Classifications.

PART IV - EROSION CONTROL MAT OR BLANKET

1. DESCRIPTION:

Work shall consist of furnishing and placing a synthetic erosion control mat and/or degradable erosion control blanket for slope face protection and lining of runoff channels.

2. EROSION CONTROL MATERIALS:

2.1 The specific erosion control material and supplier shall be pre-approved by ENGEO.

2.2 Certification: The Contractor shall submit a manufacturer's certification that the erosion mat/blanket supplied meets the criteria specified when the material was approved by ENGEO. The manufacturer's certification shall include a submittal package of documented test results that confirm the property values. In case of a dispute over validity of values, the Contractor will supply property test data from an ENGEO-approved laboratory, to support the certified values submitted. Minimum average roll values, per ASTM D 4759, shall be used for conformance determinations.

3. CONSTRUCTION:

3.1 Delivery, Storage, and Handling: Contractor shall check the erosion control material upon delivery to ensure that the proper material has been received. During all periods of shipment and storage, the erosion mat shall be protected from temperatures greater than 140 °F, mud, dirt, and debris. Manufacturer's recommendations in regard to protection from direct sunlight must also be followed. At the time of installation, the erosion mat/blanket shall be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. If approved by ENGEO, torn or punctured sections may be removed by cutting OUT a section of the mat. The remaining ends should be overlapped and secured with ground anchors. Any erosion mat/blanket damaged during storage or installation shall be replaced by the Contractor at no additional cost to the Owner.

3.2 On-Site Representative: Erosion control material suppliers shall provide a qualified and experienced representative on site, for a minimum of one day, to assist the Contractor and ENGEO personnel at the start of construction. If there is more than one slope on a project, this criteria will apply to construction of the initial slope only. The representative shall be available on an as-needed basis, as requested by ENGEO, during construction of the remaining slope(s).

3.3 Placement: The erosion control material shall be placed and anchored on a smooth graded, firm surface approved by the Engineer. Anchoring terminal ends of the erosion control material shall be accomplished through use of key trenches. The material in the trenches shall be anchored to the soil on maximum 1½ foot centers. Topsoil, if required by construction drawings, placed over final grade prior to installation of the erosion control material shall be limited to a depth not exceeding 3 inches.

3.4 Erosion control material shall be anchored, overlapped, and otherwise constructed to ensure performance until vegetation is well established. Anchors shall be as designated on the construction drawings, with a minimum of 12 inches length, and shall be spaced as designated on the construction drawings, with a maximum spacing of 4 feet.

3.5 Soil Filling: If noted on the construction drawings, the erosion control mat shall be filled with a fine grained topsoil, as recommended by the manufacturer. Soil shall be lightly raked or brushed on/into the mat to fill the mat voids or to a maximum depth of 1 inch.

PART V - GEOSYNTHETIC DRAINAGE COMPOSITE

1. DESCRIPTION:

Work shall consist of furnishing and placing a geosynthetic drainage system as a subsurface drainage medium for reinforced soil slopes.

2. DRAINAGE COMPOSITE MATERIALS:

2.1 The specific drainage composite material and supplier shall be preapproved by ENGEO.

2.2 The drain shall be of composite construction consisting of a supporting structure or drainage core material surrounded by a geotextile. The geotextile shall encapsulate the drainage core and prevent random soil intrusion into the drainage structure. The drainage core material shall consist of a three dimensional polymeric material with a structure that permits flow along the core laterally. The core structure shall also be constructed to permit flow regardless of the water inlet surface. The drainage core shall provide support to the geotextile. The fabric shall meet the minimum property requirements for filter fabric listed in Section 2.05C of the Guide Earthwork Specifications.

2.3 A geotextile flap shall be provided along all drainage core edges. This flap shall be of sufficient width for sealing the geotextile to the adjacent drainage structure edge to prevent soil intrusion into the structure during and after installation. The geotextile shall cover the full length of the core.

2.4 The geocomposite core shall be furnished with an approved method of constructing and connecting with outlet pipes or weepholes as shown on the plans. Any fittings shall allow entry of water from the core but prevent intrusion of backfill material into the core material.

2.5 Certification and Acceptance: The Contractor shall submit a manufacturer's certification that the geosynthetic drainage composite meets the design properties and respective index criteria measured in full accordance with all test methods and standards specified. The manufacturer's certification shall include a submittal package of documented test results that confirm the design values. In case of dispute over validity of design values, the Contractor will supply design property test data from an ENGEO-approved laboratory, to support the certified values submitted. Minimum average roll values, per ASTM D 4759, shall be used for determining conformance.

3. CONSTRUCTION:

3.1 Delivery, Storage, and Handling: Contractor shall check the geosynthetic drainage composite upon delivery to ensure that the proper material has been received. During all periods of shipment and storage, the geosynthetic drainage composite shall be protected from temperatures greater than 140 °F, mud, dirt, and debris. Manufacturer's recommendations in regards to protection from direct sunlight must also be followed. At the time of installation, the geosynthetic drainage composite shall be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. If approved by ENGEO, torn or punctured sections may be removed or repaired. Any geosynthetic drainage composite damaged during storage or installation shall be replaced by the Contractor at no additional cost to the Owner.

3.2 On-Site Representative: Geosynthetic drainage composite material suppliers shall provide a qualified and experienced representative on site, for a minimum of one half day, to assist the Contractor and ENGEO personnel at the start of construction with directions on the use of drainage composite. If there is more than one application on a project, this criterion will apply to construction of the initial application only. The representative shall also be available on an as-needed basis, as requested by ENGEO, during construction of the remaining applications.

3.3 Placement: The soil surface against which the geosynthetic drainage composite is to be placed shall be free of debris and inordinate irregularities that will prevent intimate contact between the soil surface and the drain.

3.4 Seams: Edge seams shall be formed by utilizing the flap of the geotextile extending from the geocomposite's edge and lapping over the top of the fabric of the adjacent course. The fabric flap shall be securely fastened to the adjacent fabric by means of plastic tape or non-water-soluble construction adhesive, as recommended by the supplier. Where vertical splices are necessary at the end of a geocomposite roll or panel, an 8-inch-wide continuous strip of geotextile may be placed, centering over the seam and continuously fastened on both sides with plastic tape or non-water-soluble construction adhesive. As an alternative, rolls of geocomposite drain material may be joined together by turning back the fabric at the roll edges and interlocking the cuspidations approximately 2 inches. For overlapping in this manner, the fabric shall be lapped and tightly taped beyond the seam with tape or adhesive. Interlocking of the core shall always be made with the upstream edge on top in the direction of water flow. To prevent soil intrusion, all exposed edges of the geocomposite drainage core edge must be covered. Alternatively, a 12-inch-wide strip of fabric may be utilized in the same manner, fastening it to the exposed fabric 8 inches in from the edge and folding the remaining flap over the core edge.

3.5 Soil Fill Placement: Structural backfill shall be placed immediately over the geocomposite drain. Care shall be taken during the backfill operation not to damage the geotextile surface of the drain. Care shall also be taken to avoid excessive settlement of the backfill material. The geocomposite drain, once installed, shall not be exposed for more than seven days prior to backfilling.

INTRODUCTION

Purpose and Scope

The purpose of this preliminary geotechnical report is to provide preliminary recommendations regarding the suitability of the site for development, as well as grading and foundation design criteria for the proposed residential development.

Our scope of services as described in our proposal dated May 17, 2005, included:

- Exploratory drilling of five to eight test borings and excavation of 10 to 16 test pits within the site.
- Sampling and laboratory testing of subsurface materials from the borings.
- Logging and visual observation of the borings and test pits.
- Review of historical aerial photographs.
- Preliminary assessment of geological hazards and development of the 1997 UBC seismic design criteria.
- Preliminary recommendations for mitigation of geotechnical constraints such as landslide hazards and expansive soils as necessary.
- Preliminary grading and foundation type recommendations for the proposed development.
- Reporting our preliminary findings and recommendations.

This preliminary report was prepared for the exclusive use of Centex Homes Corporation and their design team consultants. In the event that any changes are made in the character, design, or layout of the development, the preliminary conclusions and recommendations contained in this report must be reviewed by ENGEO Incorporated to determine whether modifications to the report are necessary. This document may not be reproduced in whole or in part by any means whatsoever, nor may it be quoted or excerpted without the expressed written consent of ENGEO Incorporated.

Site Location and Description

The site is located east of Deer Valley Road and south of Sand Creek in Antioch, California (Figure 1). The parcel (as shown on Figure 2) is approximately 104 acres and is identified by Assessors Parcel Numbers (APN) 057-042-006 and 057-050-005.

The site sits on a fairly hilly parcel ranging in elevation from approximately 200 feet above mean sea level (msl) to approximately 327 feet above msl. The site is bounded by Deer Valley Road to the east, Sand Creek to the north, and vacant fields to the east and south. Natural slope gradients at the site range from around 2:1 or steeper along the creek to relatively flat in the southeast-trending valley in the southeast portion of the site. Existing vegetation consist of native grasses. The property is currently being used for cattle grazing and is surrounded with fencing. One large oak tree is located on-site near the center of the property.

Proposed Development

Based upon preliminary hand-drawn plans prepared by Carlson, Barbee & Gibson, Inc., it is proposed to develop the property with 150 single-family lots and associated roadways and underground utilities. We anticipate that the structures will be one to two stories in height and of wood-framed construction; therefore, the building loads are expected to be light to moderate. Site grading will involve cuts up to approximately 125 feet and fills up to approximately 20 feet in order to create the building pads and street areas.

GEOLOGY AND SEISMICITY

Site Geology

The geology of the area consists mainly of Quaternary alluvium (Qa; Dibblee, 1980). The hilly portions of the site are composed of Markley Sandstone (Tkm; Dibblee, 1980) which is a tan, arkosic sandstone or minor shale. A small amount of Nortonville Shale (Tkn; Dibblee, 1980), a micaceous clay shale, is present in the southwest portion of the site.

Site Soils

Soils at the property have been classified by the U.S. Department of Agriculture as mainly belonging to the Altamont-Fontana (AcF) complex (USDA, 1977). Smaller portions of the property are additionally classified as Altamont clay (AbE), Capay clay (CaA), Pescadero clay loam (Pb) and Rincon clay loam (RbA) (USDA, 1977). The Altamont-Fontana complex is mapped over most of the site, and is composed of approximately 50 percent clay, 30 percent silty clay loam, with the remainder being comprised of other clay and loam.

Faulting and Seismicity

The site is located in a region that contains numerous active earthquake faults. However, no Holocene active faults are mapped across the site by the California Division of Mines and Geology (CDMG) or United States Geological Survey (USGS) and the site is not located within a State-mandated Earthquake Fault Zone. However, according to published maps by Jennings (1994), Bortugno (1991), and Graymer (1994) the potentially active Antioch-Davis fault crosses through the west-central portion of the project site (Figure 2).

Numerous small earthquakes occur every year in the San Francisco Bay Region, and larger earthquakes have been recorded and can be expected to occur in the future. Figure 4 shows the approximate locations of major faults and significant historic earthquakes recorded within the San Francisco Bay Region. The nearest strike-slip fault zoned as active[1] by the State of California Geological Survey is the Greenville Fault, located about 9.0 kilometers to the southwest (Figure 4). According to attenuation relationships developed by Idriss (1994), the Greenville fault is considered capable of causing a probable[2] mean horizontal site acceleration of approximately 0.34g for a maximum moment magnitude of 6.7 (Blake, 2000).

The regional seismicity of the Bay Area has recently been evaluated by the Working Group on Northern California Earthquake Probabilities (2003). The Working Group periodically attempts to summarize seismic risk in the Bay Area by presenting probabilities of M 6.7 or greater earthquakes on active Bay Area faults for a 30-year return interval. The most recent summary gives a 62 percent aggregate probability for the entire Bay Area. The Hayward-Rodgers Creek Fault, Calaveras Fault, and Concord/Green Valley Fault are assigned 27 percent, 11 percent and 4 percent probabilities, respectively.

A segment of the Great Valley Fault has been identified within 10 miles of the site. The Great Valley Fault is a blind thrust fault with no known surface expression; the postulated fault location has been based on regional seismic activity and isolated subsurface information.

[1] An active fault is defined by the State Mining and Geology Board as one that has had surface displacement within Holocene time (about the last 10,000 years) (Hart, 1992). A potentially active fault is defined by the State Mining and Geology Board as one that has had surface displacement within Pleistocene time (about the last 2,000,000 years) (Hart, 1992).

[2] From California Division of Mines and Geology Note 43: "The maximum probable earthquake is the maximum earthquake that is likely to occur during a 100-year interval. It is to be regarded as a probable occurrence, not as an assured event that will occur at a specific time." "The maximum credible earthquake is the maximum earthquake that appears possible under the presently known tectonic framework. It is a rational and believable event that is in accord with all known geologic and seismologic facts. In determining the maximum credible earthquake, little regard is given to its probability of occurrence, except that its likelihood of occurring is great enough to be of concern."

Portions of the Great Valley fault are considered seismically-active thrust faults; however, because this fault does not extend to the ground surface, it is not zoned as active by the State of California. The Great Valley fault is considered capable of causing the highest ground shaking at the site, but the recurrence interval is believed longer than for more distant, strike-slip faults. Recent studies suggest that this boundary fault may have been the cause of the Vacaville-Winters earthquake sequence of April 1892 (Eaton, 1986; Wong and Biggar, 1989; Moores and others, 1991). Further seismic activity can be expected to continue along the western margin of the Central Valley, and as with all projects in the area, the development should be designed to accommodate strong earthquake ground shaking.

GEOTECHNICAL EXPLORATION

Field Exploration

The field exploration for this study was conducted on June 21, 2005, and consisted of drilling five borings (1-B1 through 1-B5) to depths ranging from about 10 to 30 feet below existing grade, and twelve test pits (1-TP1 through 1-TP12), with approximate locations shown on Figure 2. The borings and test pits were roughly located by pacing from existing features and should be considered accurate only to the degree implied by the method used. All ENGEO exploration locations were grouted on the day of the exploration in accordance with Contra Costa County requirements.

The borings were drilled using a truck-mounted, B-24 drill rig equipped with 4-inch-diameter solid flight augers. An ENGEO engineer logged the borings in the field and collected soil samples using 3-inch O.D. California-type split-spoon samplers fitted with 6-inch-long brass liners. The samplers were driven with a 140-pound safety hammer falling a distance of 30 inches. A rope and cat-head system was used to lift the safety hammer during our exploration. The penetration of the sampler into the native materials was field recorded as the number of blows required to drive the sampler 18 inches in 6-inch increments. The boring logs show the number of blows required for the last one foot of penetration. The field logs were used to develop the report boring logs (Appendix A). The logs depict subsurface conditions within the borings for the date of drilling; however, subsurface conditions may vary with time.

Exploratory Test Pits 1-TP1 through 1-TP12 were excavated using an excavator equipped with a 30-inch-wide bucket. The test pits extended to depths ranging from 6½ to 15 feet below the ground surface (bgs). An ENGEO geologist observed the excavation of the test pits and logged the soil conditions encountered. The logs depict subsurface conditions within the test pits at the time the exploration was conducted. Subsurface conditions at other locations may differ from conditions noted at these locations. The passage of time may result in altered subsurface conditions. In addition, stratification lines represent the approximate boundaries between soil types and the transitions may be gradual.

Laboratory Testing

Representative samples of on-site soils were selected for laboratory testing to determine the following soil characteristics:

Soil Characteristic	Test Method	Report Location
Natural Unit Weight and Moisture Content	ASTM D-2216	Boring Logs, Appendix A
Plasticity Index	ASTM D-4318	Appendix C
Unconfined Compression	ASTM D-2166	Appendix C

The laboratory test results are shown on the boring logs in Appendix A and individual test results are presented in Appendix C.

Subsurface Stratigraphy

In general, the subsurface conditions encountered in our borings consist of silty clays in the upper 10 to 20 feet, and generally reached claystone or siltstone bedrock at a depth of approximately 20 to 25 feet. Detailed boring logs can be found in Appendix A. Subsurface conditions encountered in the test pits indicated that there is four to five feet of colluvium covering portions of the site, but as deep as nine feet in 1-TP4 and as shallow as 1 foot in 1-TP8 through 1-TP10. The rock units encountered on-site consisted of the Markley Sandstone and the Nortonville Shale. These units were encountered at various depths ranging from 1 to 9 feet below the ground surface. Detailed test pit logs can be found in Appendix B.

Laboratory analysis of near-surface silty soil and claystone bedrock indicates that the Plasticity Indices (PI) range from 36 through 50. This suggests that the native bedrock and soils tested are highly plastic and have a high expansion potential.

Groundwater

Groundwater was only encountered in Boring 1-B5 at a depth of approximately 13 feet bgs (187 ft msl) during drilling. Groundwater was not encountered in any of the test pits. It should be noted that the borings may not have been left open for a sufficient period of time to establish equilibrium groundwater conditions. In addition, fluctuations in groundwater levels may occur seasonally and over a period of years because of precipitation, changes in drainage patterns, irrigation and other factors. Future irrigation may cause an overall rise in groundwater levels.

APPENDIX C

PHASE I ENVIRONMENTAL SITE ASSESSMENT

PHASE ONE
ENVIRONMENTAL SITE ASSESSMENT

SULLENGER RANCH

ANTIOCH, CALIFORNIA

SUBMITTED

TO

CENTEX HOMES CORPORATION

SAN RAMON, CALIFORNIA

PREPARED

BY

ENGEO INCORPORATED

PROJECT NO. 6826.1.002.01

JUNE 29, 2005

Project No.
6826.1.002.01

June 29, 2005

Mr. John Buller
Centex Homes Corporation
2527 Camino Ramon, Suite 100
San Ramon, California 94583

Subject: Sullenger Ranch
Antioch, CA

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

Dear Mr. Buller:

ENGEO Incorporated is pleased to present our Phase One Environmental Site Assessment of the Sullenger Ranch Property located in Antioch, California. The attached report includes a description of the site assessment activities, along with ENGEO's findings regarding the Property.

We are pleased to be of service to you on this project. If you have any questions concerning the contents of our report, please contact us.

Very truly yours,

ENGEO INCORPORATED

Reviewed by:

Kelsey Adams
ka/bf/cc:esa1

Brian Flaherty

TABLE OF CONTENTS

1.0 INTRODUCTION

The subject property (Property) is located east of Deer Valley Road and south of Sand Creek in Antioch, California (Figure 1). The approximately 104-acre Property is identified as Assessor's Parcel Numbers (APN) 057-042-006 and 057-050-005 (Figure 2) and is currently occupied by vacant fields and cattle-grazing lands.

1.1 Executive Summary of Conclusions

The conclusions presented at the end of this report found no Recognized Environmental Conditions (RECs) identified within the Property. One other item of information regarding features that may require general cleanup or demolition in preparation of a changed land use is identified within the Property. We have provided a recommended action item that should be included in the future work to address the feature described in the Other Information section this report. The following sections are presented to assist the reader in evaluating our findings and recommendations.

ENGEO Incorporated has performed a Phase One Environmental Site Assessment for the Property in general conformance with the scope and limitations of ASTM 1527-00.

1.1.1 Recognized Environmental Conditions

We found no RECs connected with past use of the Property.

1.1.2 Other Information

We reviewed regulatory databases and made visual observations during our site visit. Based on these data we present information on features that were either contained in the databases or observed on the Property. These features were not considered to be RECs. We briefly discuss each feature to allow for a summary of conditions within and neighboring the Property.

1. Two petroleum pipelines, owned by Conoco Phillips and Chevron, run through the southwest corner of the Property and are visible as they cross Sand Creek. Although these pipelines show no visible sings of leakage, they should be considered an REC since they have the potential of impairing surrounding soils. ENGEO Incorporated recommends that a pipeline study, including sampling and laboratory testing be conducted should further development proceed on the Property.

2.0 PURPOSE AND SCOPE

2.1 Purpose of Phase One Environmental Site Assessment

The purpose of this Phase One Environmental Site Assessment is to identify recognized environmental conditions associated with the Property. As defined in the American Society for Testing and Materials (ASTM) Standard Practice E 1527-00, a Recognized Environmental Condition (REC) is "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property".

2.2 Detailed Scope of Services

The scope of services performed included the following:

- A review of publicly available and practically reviewable standard local, state and federal environmental record sources.
- A review of publicly available and practically reviewable standard historical sources, aerial photographs, fire insurance maps and physical setting sources.
- A reconnaissance of the Property to review site use and current conditions. The reconnaissance was conducted to check for the storage, use, production or disposal of hazardous or potentially hazardous materials.
- An interview with the current Property owner.
- Preparation of this report with our findings and conclusions.

2.3 Limitations and Exceptions of Assessment

The professional staff at ENGEO Incorporated strives to perform its services in a proper and professional manner with reasonable care and competence but is not infallible. The recommendations and conclusions presented in this report were based on the findings of our study, which were developed solely from the contracted services. The findings of the report are based in part on contracted database research, out-of-house reports and personal communications. ENGEO Incorporated assumes no liability for the validity of the materials relied upon in the preparation of this report.

This document must not be subject to unauthorized reuse; that is, reuse without written authorization of ENGEO Incorporated. Such authorization is essential because it requires ENGEO to evaluate the document's applicability given new circumstances, not the least of which is passage of time. The findings from a phase one environmental site assessment are typically valid for 180 days after completion of the report, particularly with regard to the regulatory database files. In some instances the shelf life of the report can be less.

This Phase One Environmental Site Assessment is not intended to represent a complete soil or groundwater characterization. This assessment does not define the depth or extent of soil or groundwater contamination. It is intended to provide an evaluation of potential environmental concerns associated with the use of the Property. A more extensive assessment that would include a subsurface exploration with laboratory testing of soil and groundwater samples could provide more definitive information concerning site-specific conditions. If additional assessment activities are considered for the Property and if other entities are retained to provide such services, ENGEO cannot be held responsible for any and all claims arising from or resulting from the performance of such services by other persons or entities, and from any and all claims arising or resulting from clarifications, adjustments, modifications, discrepancies or other changes necessary to reflect changed field or other conditions.

2.4 Special Terms and Conditions

ENGEO Incorporated has prepared this report for the exclusive use of our client, Centex Homes Corporation. It is recognized and agreed that ENGEO has assumed responsibility only for undertaking the study for the client. The responsibility for disclosures or reports to a third party and for remedial or mitigative action shall be solely that of the Client.

Laboratory testing of soil or groundwater samples was not within the scope of the contracted services. The assessment did not include an asbestos survey, an evaluation of lead-based paint, an inspection of light ballasts for PCBs, or a mold survey.

This report is based upon field and other conditions discovered at the time of preparation of ENGEO's work. Visual observations referenced in this report are intended only to represent conditions at the time of the reconnaissance. ENGEO would not be aware of site contamination, such as dumping and/or accidental spillage that occurred subsequent to the reconnaissance conducted by ENGEO personnel.

3.0 SITE DESCRIPTION

3.1 Location and Legal Description

The Property is located east of Deer Valley Road and south of Sand Creek in Antioch, California (Figure 1). The approximately 104-acre Property is identified as Assessor's Parcel Numbers (APN) 057-042-006 and 057-050-005 (Figure 2).

3.2 Site and Vicinity Characteristics

The Property ranges in elevation from approximately 200 feet above mean sea level (msl) in the west to approximately 327 feet above msl to the east (Figure 2). Review of the Thomas W. Dibblee (1980) geologic map found that the Property is underlain by the Quaternary alluvium (Qa) and Markley Sandstone member (Tkm), a tan arkosic sandstone or minor shale.

We reviewed the State of California, Department of Water Resources web site for ground water level data in the vicinity of the Property. Well number 01N03E17E001M mapped approximately 5.5-miles east of the Property shows that groundwater in the vicinity of the Property is between an elevation of 38 and 48 feet msl. This data reflects the elevation of the usable aquifer above msl and does not preclude the presence of shallower aquifers.

3.3 Current Use of Property/Description of Site Improvements

The Property is currently being used as cattle-grazing land. No site improvements are present on the Property.

3.4 Current and Past Use of Adjoining Properties

Current and past use of adjoining properties includes agricultural use with some residential use to the east.

4.0 RECORDS REVIEW

4.1 Historical Record Sources

The purpose of the historical record review is to develop a history of the previous uses or occupancies of the Property and surrounding area in order to identify those uses or occupancies that are likely to have led to recognized environmental conditions on the Property.

4.1.1 Historical Topographic Maps

Historical USGS 7.5' Topographic Maps were reviewed to determine if discernible changes in topography or improvements pertaining to the Property had been recorded. USGS 7.5' Antioch South Quadrangle Maps dated 1912, 1916, 1947, 1953, 1968, 1973 and 1980 were reviewed.

1912, 1916 and 1947 maps – The 1912, 1916 and 1947 topographical maps show the Property as a hilly, undeveloped area. Two hills are mapped on the Property. An unnamed road, now Deer Valley Road, is shown just to the west of the Property. A creek runs through the Property. The Southern Pacific railroad line is in place north of the Property.

1953, 1968, 1973 and 1980 maps – The 1953, 1968, 1973 and 1980 topographical maps show no major change to the topography of the Property. The two hills are shown at elevations of 327 and 328 feet above mean sea level (msl). Deer Valley Road and Sand Creek were named prior to 1953.

4.1.2 Chain of Title/Ownership

The Title Report lists recorded land title detail, ownership fees, leases, land contracts, easements, liens, deficiencies, and other encumbrances attached to or recorded against a subject property. However, laws and regulations pertaining to land trusts vary from state to state and the detail of information presented in a Title Report can vary greatly by jurisdiction. As a result, ENGEO utilizes a Title Report, when provided to us, as a supplement to other historical record sources.

The preliminary title report prepared by Alliance Title on May 23, 2005, identifies Monte Albers and Lucia Albers, co-trustees of the Monte Albers and Lucia Albers Trust, dated June 4, 1985, as to an undivided 20% interest; Hillside Group LLC, a California limited liability company as to an undivided 30% interest; and John T. Camara and Margaret Camara, his wife, as joint tenants, as to an undivided 50% interest for APN 057-042-006 and 057-050-005. A copy of the Preliminary Title Report can be found in Appendix B of this report.

4.1.3 Fire Insurance Maps

Environmental Data Resources, Inc. (EDR) prepared a Sanborn Fire insurance map search for the Property and surrounding properties. EDR reported that no maps were available for the Property and surrounding properties.

4.1.4 Other Government Contacts/Building and Planning

The City of Antioch was contacted to view any files for building permits or other structures that may have been erected on the Property. The City of Antioch Building Department had no files for the Property.

The Contra Costa County Department of Environmental Health was contacted to view any files for the Property. No files were reported for the Property.

4.1.5 Aerial Photographs

The following aerial photographs were reviewed for information regarding past conditions and land use at the Property and in the immediate vicinity.

PHOTO NUMBER	SOURCE	SCALE	DATE
1	EDR	1 in = 55 ft	1939
2	EDR	1 in = 55 ft	1958
3	EDR	1 in = 333 ft	1965
4	EDR	1 in = 690 ft	1982
5	EDR	1 in = 666 ft	1993
6	EDR	1 in = 666 ft	1998

1939 Photograph – The 1939 photograph shows the Property as undeveloped land. A creek flows through the Property running approximately east to west. Surrounding parcels are undeveloped. Some structures are present on the property directly north of the Property.

1958, 1965, 1982, and 1993 Photographs – The 1958, 1965, 1982 and 1993 photographs are very similar to the 1939 photograph. Some residences have been constructed to the east of the Property prior to 1958.

1998 Photograph – The 1998 photograph is very similar to previous photographs. No development appears on site, except for a dirt road that extends from the northwest corner to the northeast corner of the Property.

4.2 Environmental Record Sources

Environmental Data Resources Inc. (EDR) performed a search of local, state, and federal agency databases regarding the subject parcels and known contaminated sites in the immediate vicinity. A list of databases searched and their corresponding search radii is presented in Appendix A. A summary of facilities documented by EDR within the specified search radii from the Property is provided below:

4.2.1 Federal ASTM Standard/Supplemental Sources

4.2.1.1 Subject Property

The Property is not listed on the Federal ASTM Standard or Supplemental sources.

4.2.1.2 Other Properties

No properties within appropriate ASTM distance search criteria were identified on the Federal ASTM Standard or Supplemental sources.

4.2.2 State ASTM Standard/Supplemental Sources

4.2.2.1 Subject Property

The Property is not listed on the State ASTM Standard or Supplemental sources.

4.2.2.2 Other Properties

No properties within appropriate ASTM distance search criteria were identified on the State ASTM Standard or Supplemental sources.

4.2.3 Local ASTM Supplemental Sources

4.2.3.1 Subject Property

The Property is not listed on Local ASTM Supplemental databases.

4.2.3.2 Other Properties

No properties within appropriate ASTM distance search criteria were identified on Local ASTM Supplemental sources.

Properties that are on the "Orphan Summary" list were either not located or appear to be located beyond the ASTM recommended radius search criteria.

5.0 SITE RECONNAISSANCE

5.1 Methodology

ENGEO conducted a reconnaissance of the Property on June 21, 2005. The Property was viewed for hazardous materials storage, superficial staining or discoloration, debris, stressed vegetation, or other conditions that may be indicative of potential sources of soil or groundwater contamination. The site was also reviewed for evidence of fill/ventilation pipes, ground subsidence, or other evidence of existing or preexisting underground storage tanks.

5.2 General Site Setting

The site is currently being used as cattle-grazing land. Sand Creek runs through the Property and was dry at the time of the reconnaissance. Two petroleum pipelines run across the southwest corner of Property, and are visible as they cross Sand Creek. Two dirt roads provide access across the Property.

5.3 Exterior Observations

Structures

No structures were on the Property at the time of the reconnaissance.

Hazardous Substances and Petroleum Products in Connection with Identified Uses

No hazardous substances or petroleum products in connection with identified uses were noted on the Property during the reconnaissance.

Storage Tanks

No storage tanks were noted on the Property during the reconnaissance.

Odors

No odors were encountered on the Property during the reconnaissance.

Pools of Potentially Hazardous Liquid

No pools of potentially hazardous liquids were noted on the Property during the reconnaissance.

Drums

No drums were present on the Property during the reconnaissance.

Hazardous Substance and Petroleum Product Containers

No hazardous substances or petroleum product containers were noted on the Property during the reconnaissance.

Polychlorinated Biphenyls (PCBs)

No sources of PCBs were noted on the Property during the reconnaissance.

Pits, Ponds and Lagoons

No pits, ponds or lagoons were noted on the Property during the reconnaissance.

Stained Soil/Pavement

No stained soil or pavement was noted on the Property during the reconnaissance.

Stressed Vegetation

No stressed vegetation was noted on the Property during the reconnaissance.

Solid Waste

No solid waste was present on the Property during the reconnaissance.

Wastewater

No conveyance of wastewater was noted on the Property during the reconnaissance.

Wells

No wells were noted on the Property during the reconnaissance.

Septic Systems

No septic systems were noted on the Property during the reconnaissance.

5.4 Asbestos-Containing Materials (ACM) and Lead-Based Paint

An asbestos and lead-based paint survey was not conducted as part of this assessment. No structures are currently located with the Property.

5.5 Indoor Air Quality

An evaluation of indoor air quality, mold, or radon was not included as part of the contracted scope of services. The USEPA and CAL - EPA have conducted studies of radon risks throughout the state. Results of the studies indicate that average statistical radon concentrations in Contra Costa County are less than the current EPA action level.

6.0 INTERVIEWS

During the site reconnaissance, an ENGEO staff engineer interviewed Mr. Walt Bartlett, who leases the Property as cattle grazing land. He indicated that the Property has been used as cattle grazing land for several years. No environmental concerns were mentioned during the interview.

An Environmental Site Assessment Questionnaire was completed by the Client. The questionnaire did not indicate any environmental concerns related to the Property. A copy of the questionnaire is presented in Appendix C of the report.

7.0 CONCLUSIONS

The reconnaissance and records research did not find documentation or physical evidence of soil or groundwater impairments associated with the use of the Property. A review of regulatory databases maintained by county, state and federal agencies found no documentation of hazardous materials violations or discharge on the Property. No documented soil or groundwater contamination associated with abutting properties was found from the records research.

ENGEO Incorporated has performed a Phase One Environmental Site Assessment in general conformance with the scope and limitations of ASTM 1527-00. Based on the findings of the assessment, there are no Recognized Environmental Conditions (RECs) within the Property.

7.1 Other Information

1. Two petroleum pipelines, owned by Conoco Phillips and Chevron, run through the southwest corner of the Property and are visible as they cross Sand Creek. Although these pipelines show no visible sings of leakage, they should be considered an REC since they have the potential of impairing surrounding soils. ENGEO Incorporated recommends that a pipeline study, including sampling and laboratory testing, be conducted should further development proceed on the Property.

SELECTED REFERENCES

Geologic – Antioch-South Quadrangle. Dibblee, 1980

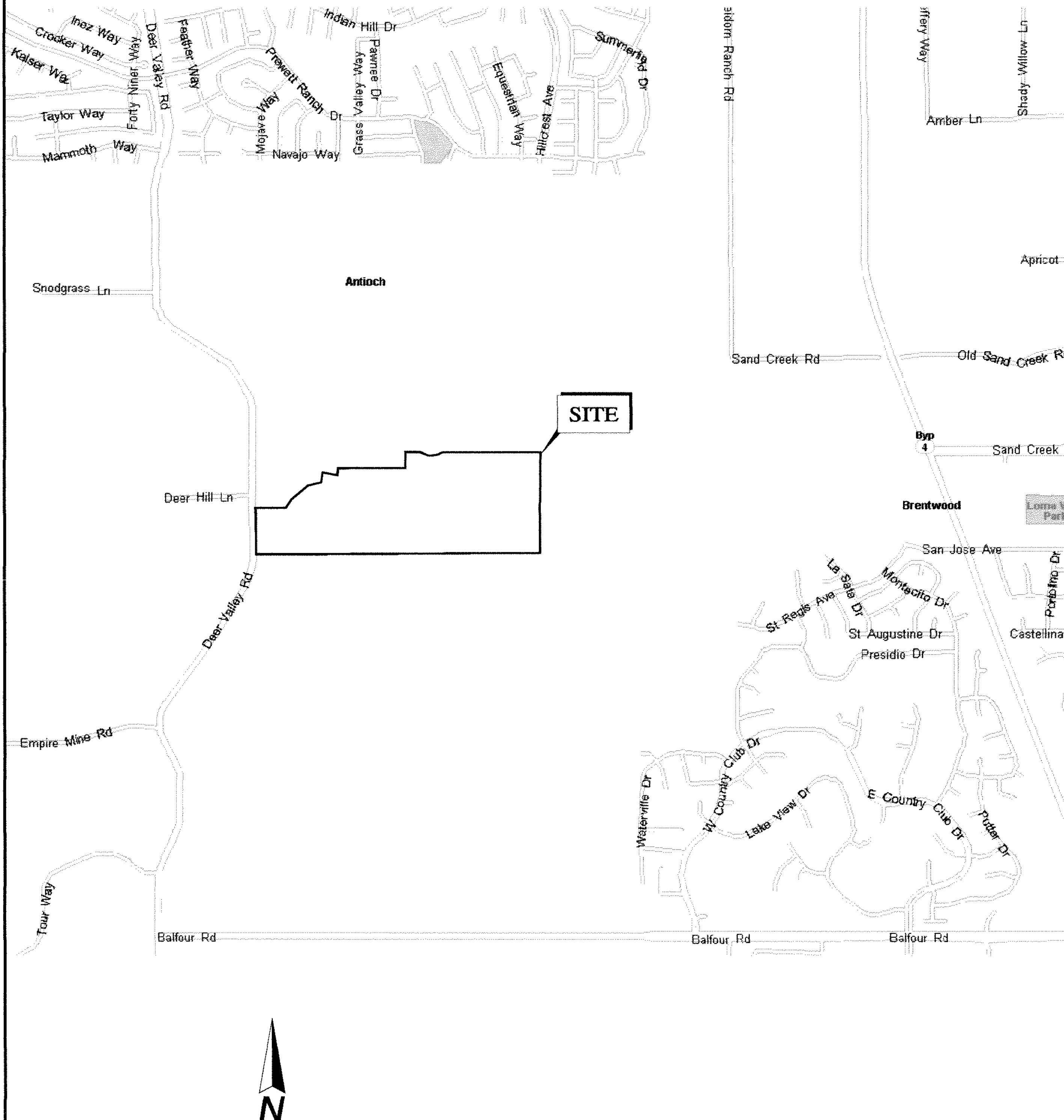
USGS 7.5' Antioch-South Quadrangle-Contra Costa County Maps dated 1912, 1916, 1947, 1953, 1968, 1973 and 1980.

EPA Assessment of Risks from Radon in Homes, United State Environmental Protection Agency, Office of Radiation and Indoor Air, June 2003

http://wdl.water.ca.gov

http://www.terraserver.microsoft.com

LIST OF FIGURES



BASE MAP SOURCE: MS STREETS AND TRIPS

NO SCALE

ENGEO INCORPORATED
EXCELLENT SERVICE SINCE 1971

SITE VICINITY MAP
SULLENGER RANCH
ANTIOCH, CALIFORNIA

PROJECT NO.: 6826.1.002.01
DATE: JULY 2005
DRAWN BY: PC
CHECKED BY: JT
FIGURE NO. 1

ORIGINAL FIGURE PRINTED IN COLOR

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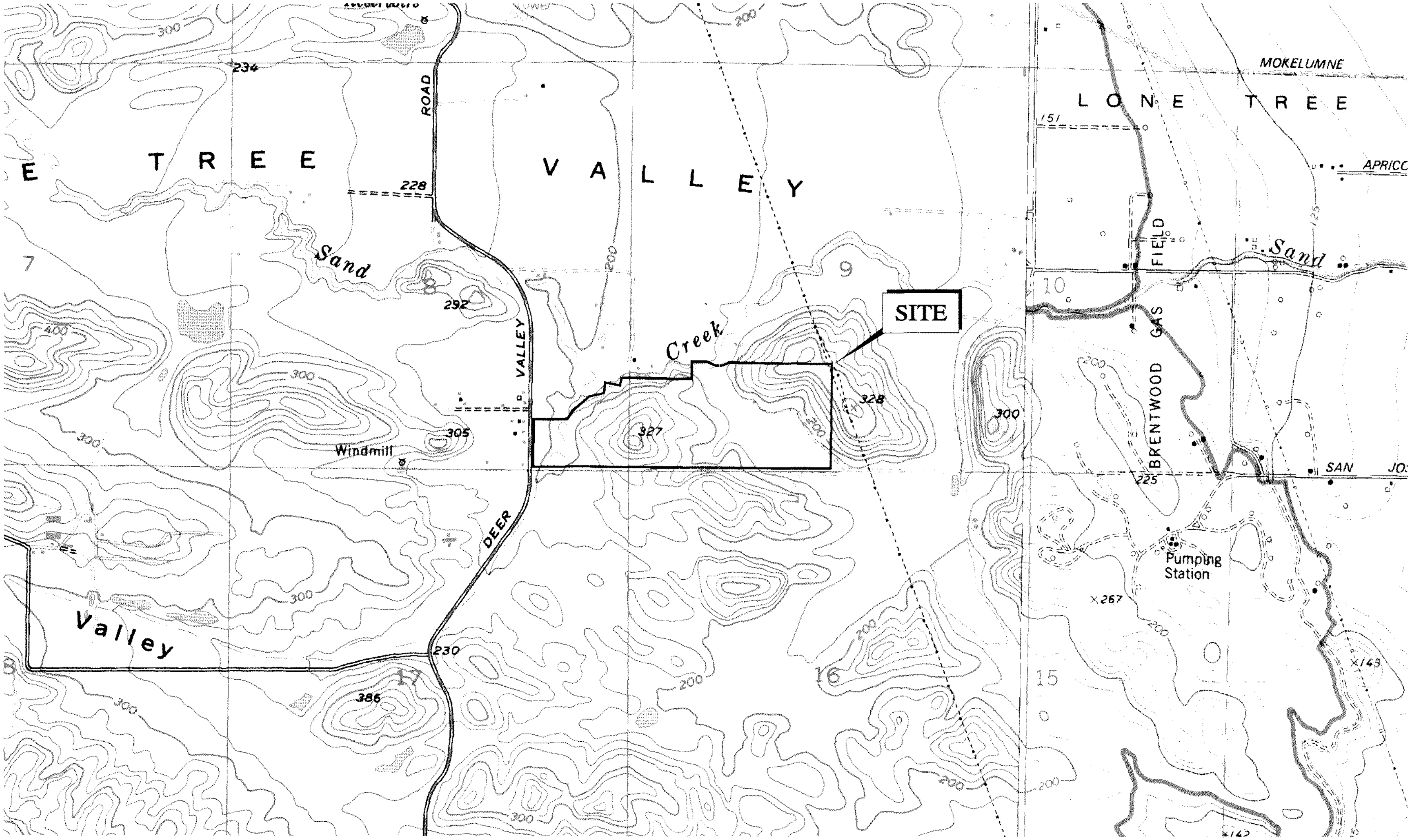
ORIGINAL FIGURE PRINTED IN COLOR



BASE MAP SOURCE: USGS

0 FEET 2000
0 METERS 1000

ENGEO INCORPORATED
EXCELLENT SERVICE SINCE 1971

TOPOGRAPHIC MAP
SULLENGER RANCH
ANTIOCH, CALIFORNIA

PROJECT NO.: 6826.1.002.01	
DATE: JULY 2005	
DRAWN BY: PC	CHECKED BY: JT

FIGURE NO. 2

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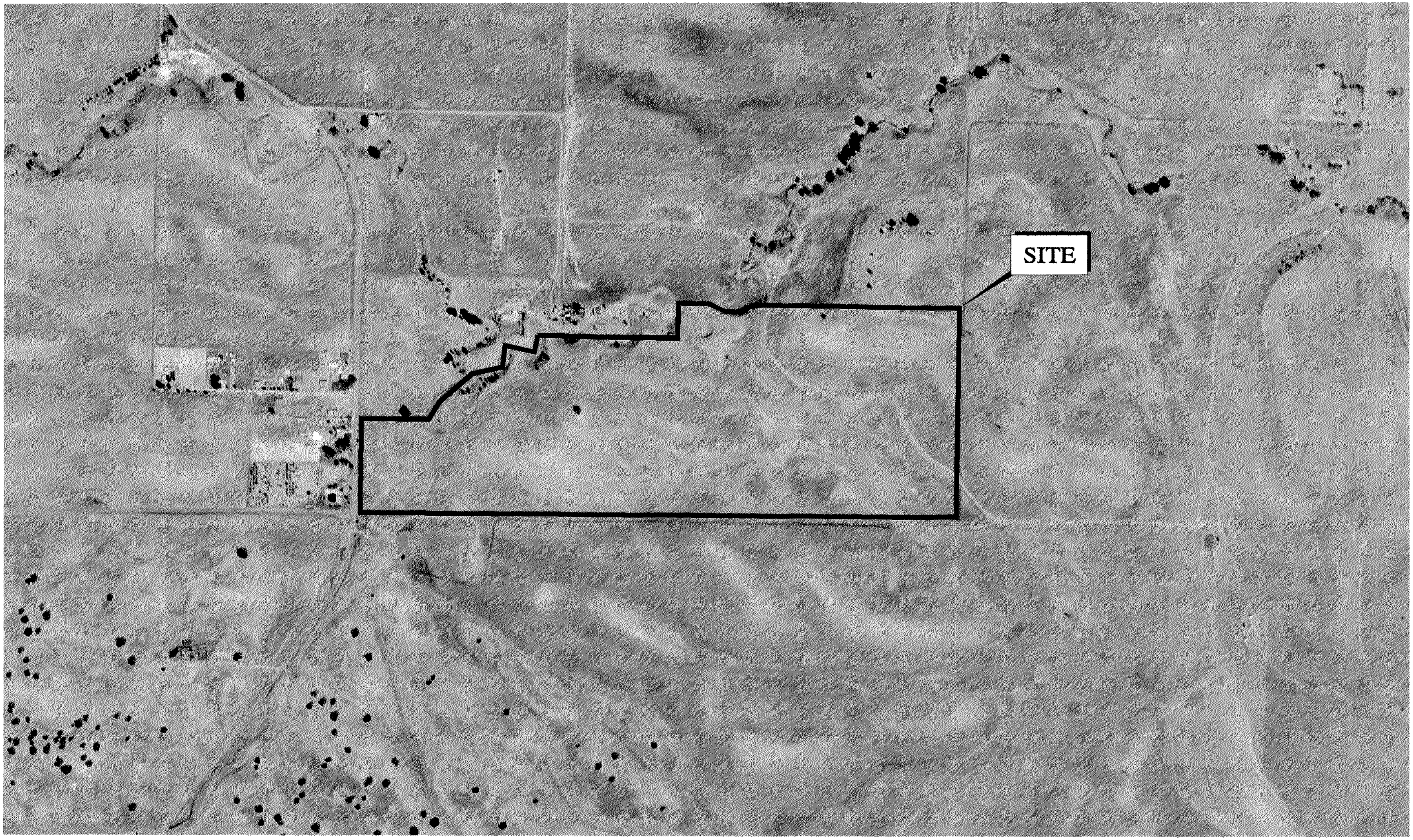
ORIGINAL FIGURE PRINTED IN COLOR



N

BASE MAP SOURCE: USGS

0 FEET 1000
0 METERS 500

ENGEO INCORPORATED
EXCELLENT SERVICE SINCE 1971

AERIAL PHOTOGRAPH SULLENGER RANCH ANTIOCH, CALIFORNIA	PROJECT NO.: 6826.1.002.01 DATE: JULY 2005 DRAWN BY: PC CHECKED BY: JT	FIGURE NO. 3

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APPENDIX A

ENVIRONMENTAL DATA RESOURCES, INC.

Sanborn Map Report
Radius Map Report
Historical Topographic Map Report
Aerial Photograph Report

6826.1.002.01
June 29, 2005

EDR™ Environmental Data Resources Inc

"Linking Technology with Tradition"®

Sanborn® Map Report

Ship To:	Kelsey Adams	**Order Date:** 6/27/2005	**Completion Date:** 6/27/2005
	Engeo Inc.	**Inquiry #:**	1454086.3
	2010 Crow Canyon Place	**P.O. #:**	NA
	San Ramon, CA 94583	**Site Name:**	Sullenger Ranch
		Address:	Deer Valley Rd
Customer Project:	6826.1.001.01	**City/State:**	Antioch, CA 94513
1018035WIL	925-866-9000	**Cross Streets:**	

This document reports that the largest and most complete collection of Sanborn fire insurance maps has been reviewed based on client supplied information, and fire insurance maps depicting the target property at the specified address were not identified.

NO COVERAGE

The EDR Radius Map
with GeoCheck®

Sullenger Ranch
Deer Valley Rd
Antioch, CA 94531

Inquiry Number: 01454086.2r

June 27, 2005

EDR™ Environmental
Data Resources Inc

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06460

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

DEER VALLEY RD
ANTIOCH, CA 94531

COORDINATES

Latitude (North):	37.940600 - 37˚ 56' 26.2"
Longitude (West):	121.769900 - 121˚ 46' 11.6"
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	608091.3
UTM Y (Meters):	4199732.5
Elevation:	269 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	37121-H7 ANTIOCH SOUTH, CA
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL .... National Priority List
Proposed NPL .... Proposed National Priority List Sites
CERCLIS .... Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP .... CERCLIS No Further Remedial Action Planned
CORRACTS .... Corrective Action Report
RCRA-TSDF .... Resource Conservation and Recovery Act Information
RCRA-LQG .... Resource Conservation and Recovery Act Information
RCRA-SQG .... Resource Conservation and Recovery Act Information
ERNS .... Emergency Response Notification System

STATE ASTM STANDARD

AWP .... Annual Workplan Sites

EXECUTIVE SUMMARY

Cal-Sites	Calsites Database
CHMIRS	California Hazardous Material Incident Report System
Cortese	"Cortese" Hazardous Waste & Substances Sites List
Notify 65	Proposition 65 Records
Toxic Pits	Toxic Pits Cleanup Act Sites
SWF/LF	Solid Waste Information System
WMUDS/SWAT	Waste Management Unit Database
LUST	Geotracker's Leaking Underground Fuel Tank Report
CA BOND EXP. PLAN	Bond Expenditure Plan
UST	List of Underground Storage Tank Facilities
VCP	Voluntary Cleanup Program Properties
INDIAN LUST	Leaking Underground Storage Tanks on Indian Land
INDIAN UST	Underground Storage Tanks on Indian Land
CA FID UST	Facility Inventory Database
HIST UST	Hazardous Substance Storage Container Database

FEDERAL ASTM SUPPLEMENTAL

CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
Delisted NPL	National Priority List Deletions
FINDS	Facility Index System/Facility Identification Initiative Program Summary Report
HMIRS	Hazardous Materials Information Reporting System
MLTS	Material Licensing Tracking System
MINES	Mines Master Index File
NPL Liens	Federal Superfund Liens
PADS	PCB Activity Database System
US ENG CONTROLS	Engineering Controls Sites List
ODI	Open Dump Inventory
DOD	Department of Defense Sites
INDIAN RESERV	Indian Reservations
UMTRA	Uranium Mill Tailings Sites
FUDS	Formerly Used Defense Sites
RAATS	RCRA Administrative Action Tracking System
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
SSTS	Section 7 Tracking Systems
FTTS INSP	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

AST	Aboveground Petroleum Storage Tank Facilities
CLEANERS	Cleaner Facilities
CA WDS	Waste Discharge System
DEED	Deed Restriction Listing
NFA	No Further Action Determination
WIP	Well Investigation Program Case List
EMI	Emissions Inventory Data
REF	Unconfirmed Properties Referred to Another Agency
SCH	School Property Evaluation Program
NFE	Properties Needing Further Evaluation
SLIC	Statewide SLIC Cases
HAZNET	Facility and Manifest Data

EXECUTIVE SUMMARY

CONTRA COSTA CO. SITE LIST Site List

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas .... Former Manufactured Gas (Coal Gas) Sites

BROWNFIELDS DATABASES

US BROWNFIELDS .... A Listing of Brownfields Sites
US INST CONTROL .... Sites with Institutional Controls
VCP .... Voluntary Cleanup Program Properties

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were not identified.

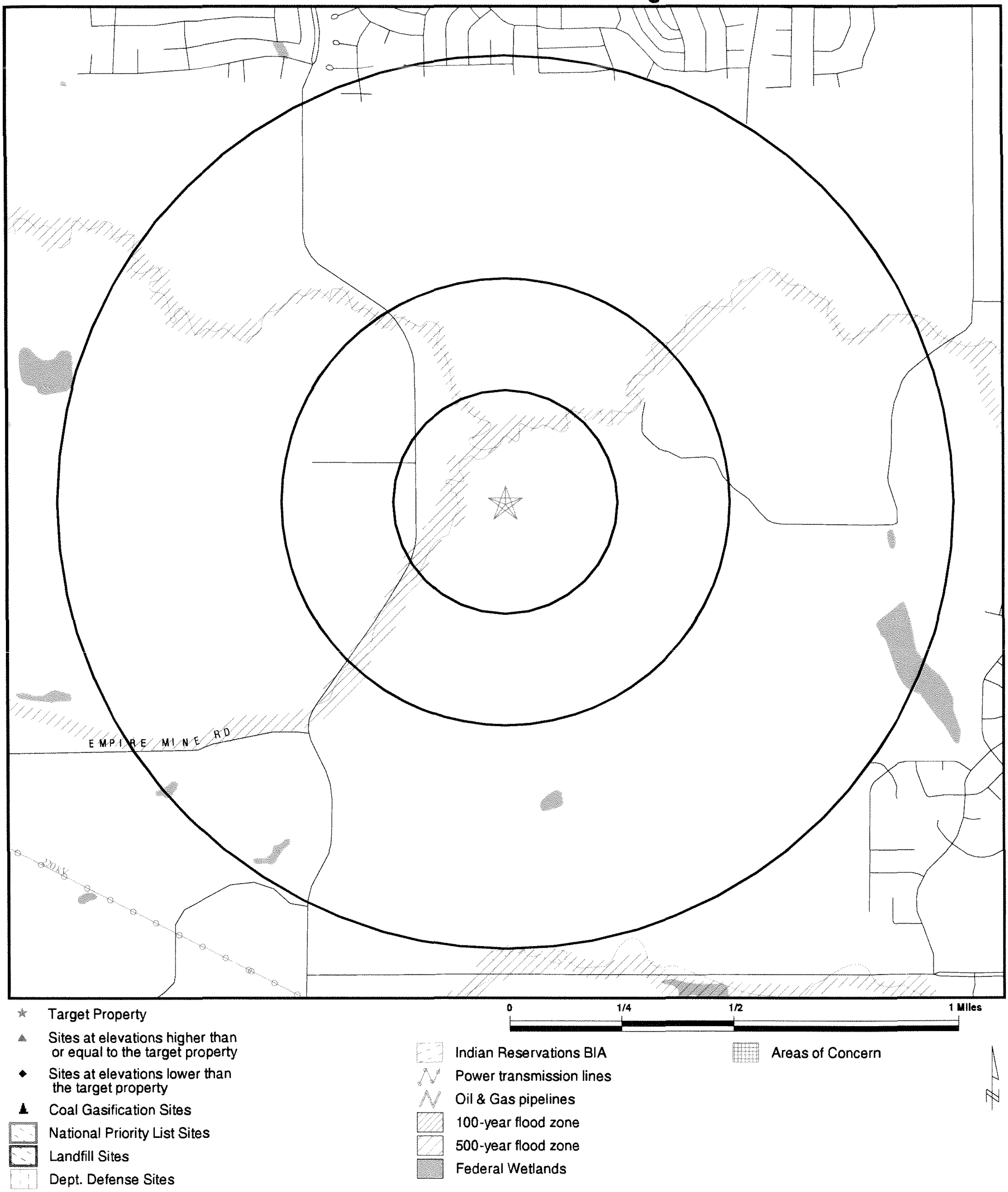
Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

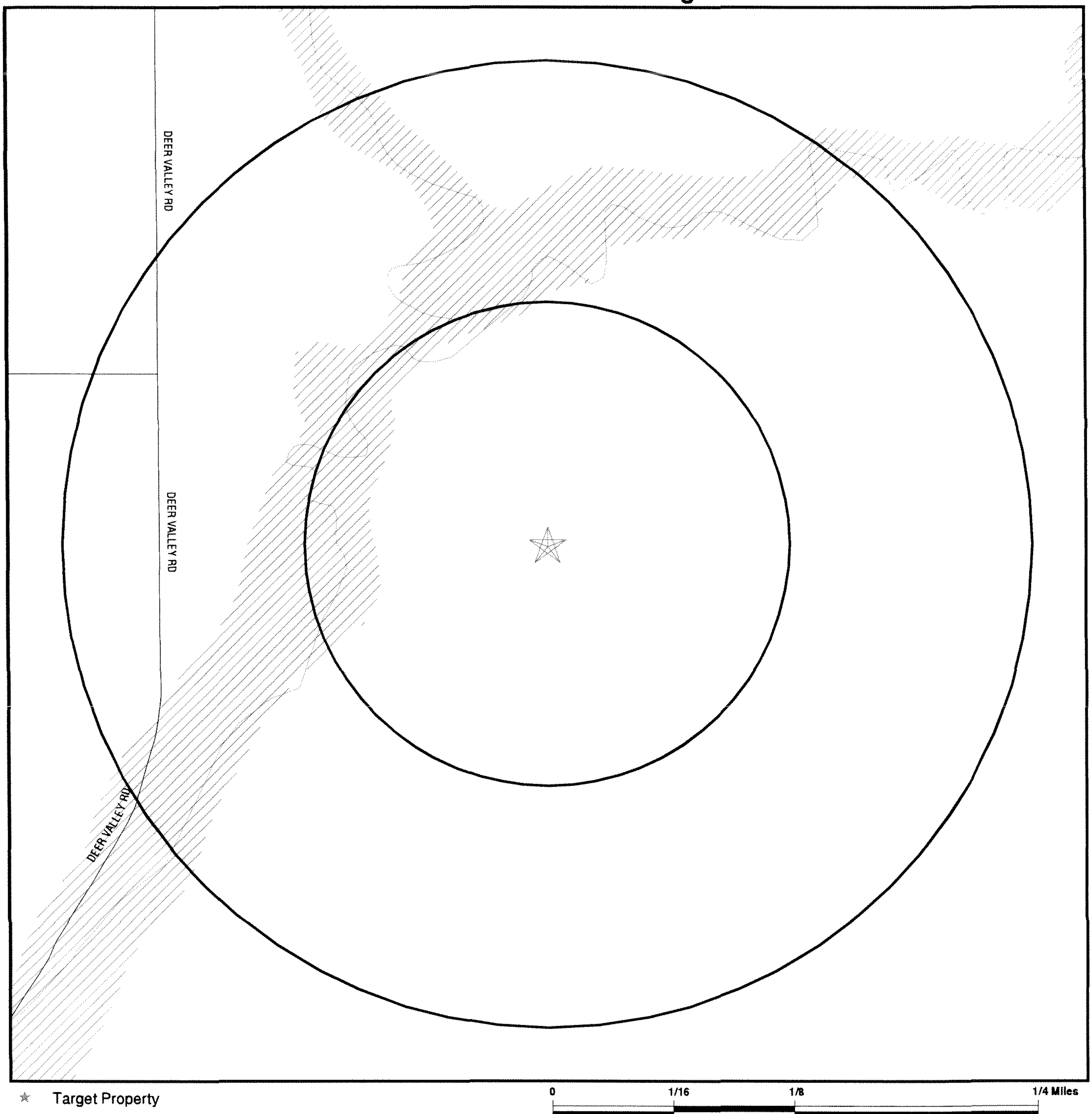
Site Name	Database(s)
BLUE GOOSE PROPERTIES	LUST, Cortese
SANTA FE PACIFIC PIPELINE PARTNERS	CERC-NFRAP
HOLLAND TRACT - PAPER PULP LANDSPREADING	SWF/LF
EAST CONTRA COSTA CO COLLECTION CNTR	SWF/LF
MANGINI BROS	UST, CONTRA COSTA CO. SITE LIST
LADD, L. JORDAN	UST, CONTRA COSTA CO. SITE LIST
RIPPEE RANCH	HIST UST
MANGINI BROS	HIST UST
PREWETT RANCH	HIST UST
L. ORDAN LADD	HIST UST
SEKO RANCH	HIST UST
NORMAN'S BRENTWOOD NURSERY	CA FID UST, CONTRA COSTA CO. SITE LIST
BILL BRANDT FORD, INC.	CA FID UST, CONTRA COSTA CO. SITE LIST
SAND HILL RANCH	CA FID UST, CONTRA COSTA CO. SITE LIST
SEKO RANCH	CA FID UST, CONTRA COSTA CO. SITE LIST
CHEAPER! #151	CA FID UST, CONTRA COSTA CO. SITE LIST
RODDY RANCH	HAZNET, CONTRA COSTA CO. SITE LIST
BETTENCOURT, EVELYN T	CONTRA COSTA CO. SITE LIST
HARDIN, CHARLES W	CONTRA COSTA CO. SITE LIST
BRANSCUM, LUTHER W	CONTRA COSTA CO. SITE LIST
SOITE, CATARINA	CONTRA COSTA CO. SITE LIST
KARAGLANIS, FRANK P	CONTRA COSTA CO. SITE LIST
A L CHRISTENSEN & SON	CONTRA COSTA CO. SITE LIST
RIPPEE RANCH	CONTRA COSTA CO. SITE LIST
MAGGIORA, MELVIN	CONTRA COSTA CO. SITE LIST
CARLISLE, ROY	CONTRA COSTA CO. SITE LIST
CLEMONS, EARL	CONTRA COSTA CO. SITE LIST
CAL TRANS HIGHWAY WIDENING	CONTRA COSTA CO. SITE LIST
MARSH CREEK #2 DEHYDRATION STATION	CONTRA COSTA CO. SITE LIST
NICHOLSON COMPANY	CONTRA COSTA CO. SITE LIST

OVERVIEW MAP - 01454086.2r - Engeo Inc.



TARGET PROPERTY:	Sullenger Ranch	CUSTOMER:	Engeo Inc.
ADDRESS:	Deer Valley Rd	CONTACT:	Kelsey Adams
CITY/STATE/ZIP:	Antioch CA 94531	INQUIRY #:	01454086.2r
LAT/LONG:	37.9406 / 121.7699	DATE:	June 27, 2005 2:16 pm

DETAIL MAP - 01454086.2r - Engeo Inc.



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

TARGET PROPERTY:	Sullenger Ranch	CUSTOMER:	Engeo Inc.
ADDRESS:	Deer Valley Rd	CONTACT:	Kelsey Adams
CITY/STATE/ZIP:	Antioch CA 94531	INQUIRY #:	01454086.2r
LAT/LONG:	37.9406 / 121.7699	DATE:	June 27, 2005 2:17 pm

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL ASTM STANDARD								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.250	0	0	NR	NR	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRA TSD		0.500	0	0	0	NR	NR	0
RCRA Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRA Sm. Quan. Gen.		0.250	0	0	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
STATE ASTM STANDARD								
AWP		1.000	0	0	0	0	NR	0
Cal-Sites		1.000	0	0	0	0	NR	0
CHMIRS		TP	NR	NR	NR	NR	NR	0
Cortese		0.500	0	0	0	NR	NR	0
Notify 65		1.000	0	0	0	0	NR	0
Toxic Pits		1.000	0	0	0	0	NR	0
State Landfill		0.500	0	0	0	NR	NR	0
WMUDS/SWAT		0.500	0	0	0	NR	NR	0
LUST		0.500	0	0	0	NR	NR	0
CA Bond Exp. Plan		1.000	0	0	0	0	NR	0
UST		0.250	0	0	NR	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0
INDIAN LUST		0.500	0	0	0	NR	NR	0
INDIAN UST		0.250	0	0	NR	NR	NR	0
CA FID UST		0.250	0	0	NR	NR	NR	0
HIST UST		0.250	0	0	NR	NR	NR	0
FEDERAL ASTM SUPPLEMENTAL								
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
US ENG CONTROLS		0.500	0	0	0	NR	NR	0
ODI		0.500	0	0	0	NR	NR	0
DOD		1.000	0	0	0	0	NR	0
INDIAN RESERV		1.000	0	0	0	0	NR	0
UMTRA		0.500	0	0	0	NR	NR	0
FUDS		1.000	0	0	0	0	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
STATE OR LOCAL ASTM SUPPLEMENTAL								
AST		TP	NR	NR	NR	NR	NR	0
CLEANERS		0.250	0	0	NR	NR	NR	0
CA WDS		TP	NR	NR	NR	NR	NR	0
DEED		0.500	0	0	0	NR	NR	0
NFA		0.250	0	0	NR	NR	NR	0
WIP		0.250	0	0	NR	NR	NR	0
EMI		TP	NR	NR	NR	NR	NR	0
REF		0.250	0	0	NR	NR	NR	0
SCH		0.250	0	0	NR	NR	NR	0
NFE		0.250	0	0	NR	NR	NR	0
SLIC		0.500	0	0	0	NR	NR	0
HAZNET		TP	NR	NR	NR	NR	NR	0
Contra Costa Co. Site List		0.250	0	0	NR	NR	NR	0
EDR PROPRIETARY HISTORICAL DATABASES								
Coal Gas		1.000	0	0	0	0	NR	0
BROWNFIELDS DATABASES								
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
US INST CONTROL		0.500	0	0	0	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0

NOTES:

AQUIFLOW - see EDR Physical Setting Source Addendum

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

Map ID Direction Distance Distance (ft.) Elevation	Site	Database(s)	EDR ID Number EPA ID Number

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

NO SITES FOUND

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
ANTIOCH	S102359868	HOLLAND TRACT - PAPER PULP LANDSPREADING	HOLLAND TRACT, KNIGHTSEN CA 94548		SWF/LF
ANTIOCH	S106528913	EAST CONTRA COSTA CO COLLECTION CNTR	WILBER AVE @ VIERA AVE		SWF/LF
BRENTWOOD	S102260121	BETTENCOURT, EVELYN T	RT 1, BOX 116	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S102260124	HARDIN, CHARLES W	RT 1, BOX 55A	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S102260125	BRANSCUM, LUTHER W	RT 1, BOX 55B	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S102260126	SOITE, CATARINA	RT 1, BOX 7	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S103464216	KARAGLANIS, FRANK P	RT 1, BOX 42	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S106516835	A L CHRISTENSEN & SON	RT 1, BOX 20	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	U001596371	RIPPEE RANCH	RR 2 BOX 241	94513	HIST UST
BRENTWOOD	S104161982	RIPPEE RANCH	RT 2, BOX 241	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S102260127	MAGGIORA, MELVIN	RT 2, BOX 197	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S102260129	CARLISLE, ROY	RT 2, BOX 261	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S101580870	NORMAN'S BRENTWOOD NURSERY	RR 3 BOX 526 HWY 4	94513	CA FID UST, CONTRA COSTA CO. SITE LIST
BRENTWOOD	S101580858	CLEMONS, EARL	RT 3, BOX 970	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S101623515	BILL BRANDT FORD, INC.	1245 HIGHWAY 4	94513	CA FID UST, CONTRA COSTA CO. SITE LIST
BRENTWOOD	S102260089	CAL TRANS HIGHWAY WIDENING	HWY 4 / SPRUCE	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S103464211	MARSH CREEK #2 DEHYDRATION STATION	HWY 4 / SUNSET RD	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S105022926	BLUE GOOSE PROPERTIES	380 HWY 4 S	94513	LUST, Cortese
BRENTWOOD	U001596363	MANGINI BROS	HIGHWAY 4	94513	HIST UST
BRENTWOOD	U003784124	MANGINI BROS	HWY 4	94513	UST, CONTRA COSTA CO. SITE LIST
BRENTWOOD	U001596368	PREWETT RANCH	PO BOX 730	94513	HIST UST
BRENTWOOD	U001596356	L. ORDAN LADD	BYRON HIGHWAY AT	94513	HIST UST
BRENTWOOD	U003784169	LADD, L. JORDAN	BYRON HWY	94513	UST, CONTRA COSTA CO. SITE LIST
BRENTWOOD	S101580980	SAND HILL RANCH	CAMINO DIABLO	94513	CA FID UST, CONTRA COSTA CO. SITE LIST
BRENTWOOD	S102260074	RODDY RANCH	CHADBOURNE ROAD	94513	HAZNET, CONTRA COSTA CO. SITE LIST
BRENTWOOD	1003879687	SANTA FE PACIFIC PIPELINE PARTNERS	SE CORNER OF BALFOUR RD & FAIRVIEW AVE.	94513	CERC-NFRAP
BRENTWOOD	U001596379	SEKO RANCH	100 AA EUREKA AVE	94513	HIST UST
BRENTWOOD	S101623531	SEKO RANCH	100 AA EUREKA AVE	94513	CA FID UST, CONTRA COSTA CO. SITE LIST
BRENTWOOD	S101581132	CHEAPER! #151	LONE TREE WAY/HWY 4	94513	CA FID UST, CONTRA COSTA CO. SITE LIST
BRENTWOOD	S102260139	NICHOLSON COMPANY	SPRUCE AVE / HWY 4	94513	CONTRA COSTA CO. SITE LIST

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

FEDERAL ASTM STANDARD RECORDS

NPL: National Priority List
Source: EPA
Telephone: N/A
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/28/05
Date Made Active at EDR: 05/16/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 05/04/05
Elapsed ASTM days: 12
Date of Last EDR Contact: 05/04/05

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 6
Telephone: 214-655-6659

EPA Region 8
Telephone: 303-312-6774

Proposed NPL: Proposed National Priority List Sites
Source: EPA
Telephone: N/A

Date of Government Version: 04/27/05
Date Made Active at EDR: 05/16/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 05/04/05
Elapsed ASTM days: 12
Date of Last EDR Contact: 05/04/05

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
Source: EPA
Telephone: 703-413-0223
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/15/05
Date Made Active at EDR: 04/06/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 03/22/05
Elapsed ASTM days: 15
Date of Last EDR Contact: 03/22/05

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned
Source: EPA
Telephone: 703-413-0223
As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

Date of Government Version: 03/22/05
Date Made Active at EDR: 04/06/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 04/01/05
Elapsed ASTM days: 5
Date of Last EDR Contact: 04/01/05

CORRACTS: Corrective Action Report
Source: EPA
Telephone: 800-424-9346
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/29/05
Date Made Active at EDR: 05/16/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 04/11/05
Elapsed ASTM days: 35
Date of Last EDR Contact: 03/07/05

RCRA: Resource Conservation and Recovery Act Information
Source: EPA
Telephone: 800-424-9346
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 05/20/05
Date Made Active at EDR: 06/09/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 05/24/05
Elapsed ASTM days: 16
Date of Last EDR Contact: 05/24/05

ERNS: Emergency Response Notification System
Source: National Response Center, United States Coast Guard
Telephone: 202-260-2342
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/04
Date Made Active at EDR: 03/24/05
Database Release Frequency: Annually
Date of Data Arrival at EDR: 01/27/05
Elapsed ASTM days: 56
Date of Last EDR Contact: 04/25/05

FEDERAL ASTM SUPPLEMENTAL RECORDS

BRS: Biennial Reporting System
Source: EPA/NTIS
Telephone: 800-424-9346
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/01/01
Database Release Frequency: Biennially
Date of Last EDR Contact: 04/15/05
Date of Next Scheduled EDR Contact: 06/13/05

CONSENT: Superfund (CERCLA) Consent Decrees
Source: Department of Justice, Consent Decree Library
Telephone: Varies
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/14/04
Database Release Frequency: Varies

Date of Last EDR Contact: 04/26/05
Date of Next Scheduled EDR Contact: 07/25/05

ROD: Records Of Decision
Source: EPA
Telephone: 703-416-0223
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 01/10/05
Database Release Frequency: Annually

Date of Last EDR Contact: 04/04/05
Date of Next Scheduled EDR Contact: 07/04/05

DELISTED NPL: National Priority List Deletions
Source: EPA
Telephone: N/A
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/28/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/04/05
Date of Next Scheduled EDR Contact: 08/01/05

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report
Source: EPA
Telephone: N/A
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/11/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/04/05
Date of Next Scheduled EDR Contact: 07/04/05

HMIRS: Hazardous Materials Information Reporting System
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/04
Database Release Frequency: Annually

Date of Last EDR Contact: 04/19/05
Date of Next Scheduled EDR Contact: 07/18/05

MLTS: Material Licensing Tracking System
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/14/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/04/05
Date of Next Scheduled EDR Contact: 07/04/05

MINES: Mines Master Index File
Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/11/05
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/30/05
Date of Next Scheduled EDR Contact: 06/27/05

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 202-564-4267
Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 02/22/05
Date of Next Scheduled EDR Contact: 05/23/05

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-564-3887
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/30/05
Database Release Frequency: Annually

Date of Last EDR Contact: 05/10/05
Date of Next Scheduled EDR Contact: 08/08/05

DOD: Department of Defense Sites
Source: USGS
Telephone: 703-692-8801
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 10/01/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/08/05
Date of Next Scheduled EDR Contact: 05/09/05

UMTRA: Uranium Mill Tailings Sites
Source: Department of Energy
Telephone: 505-845-0011
Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized. In 1978, 24 inactive uranium mill tailings sites in Oregon, Idaho, Wyoming, Utah, Colorado, New Mexico, Texas, North Dakota, South Dakota, Pennsylvania, and on Navajo and Hopi tribal lands, were targeted for cleanup by the Department of Energy.

Date of Government Version: 12/29/04
Database Release Frequency: Varies

Date of Last EDR Contact: 03/22/05
Date of Next Scheduled EDR Contact: 06/20/05

ODI: Open Dump Inventory
Source: Environmental Protection Agency
Telephone: 800-424-9346
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/85
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 05/23/95
Date of Next Scheduled EDR Contact: N/A

FUDS: Formerly Used Defense Sites
Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/03
Database Release Frequency: Varies

Date of Last EDR Contact: 04/04/05
Date of Next Scheduled EDR Contact: 07/04/05

INDIAN RESERV: Indian Reservations
Source: USGS
Telephone: 202-208-3710
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 10/01/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/08/05
Date of Next Scheduled EDR Contact: 05/09/05

US ENG CONTROLS: Engineering Controls Sites List
Source: Environmental Protection Agency
Telephone: 703-603-8867
A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 01/10/05
Database Release Frequency: Varies

Date of Last EDR Contact: 04/04/05
Date of Next Scheduled EDR Contact: 07/04/05

RAATS: RCRA Administrative Action Tracking System
Source: EPA
Telephone: 202-564-4104
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 03/07/05
Date of Next Scheduled EDR Contact: 06/06/05

TRIS: Toxic Chemical Release Inventory System
Source: EPA
Telephone: 202-566-0250
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/02
Database Release Frequency: Annually

Date of Last EDR Contact: 03/22/05
Date of Next Scheduled EDR Contact: 06/20/05

TSCA: Toxic Substances Control Act
Source: EPA
Telephone: 202-260-5521
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/02
Database Release Frequency: Every 4 Years

Date of Last EDR Contact: 04/05/05
Date of Next Scheduled EDR Contact: 06/06/05

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA
Telephone: 202-566-1667

Date of Government Version: 04/13/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/21/05
Date of Next Scheduled EDR Contact: 06/20/05

SSTS: Section 7 Tracking Systems
Source: EPA
Telephone: 202-564-4203
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/03
Database Release Frequency: Annually
Date of Last EDR Contact: 04/19/05
Date of Next Scheduled EDR Contact: 07/18/05

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/13/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/21/05
Date of Next Scheduled EDR Contact: 06/20/05

STATE OF CALIFORNIA ASTM STANDARD RECORDS

AWP: Annual Workplan Sites
Source: California Environmental Protection Agency
Telephone: 916-323-3400
Known Hazardous Waste Sites. California DTSC's Annual Workplan (AWP), formerly BEP, identifies known hazardous substance sites targeted for cleanup.

Date of Government Version: 02/07/05
Date Made Active at EDR: 04/05/05
Database Release Frequency: Annually
Date of Data Arrival at EDR: 03/01/05
Elapsed ASTM days: 35
Date of Last EDR Contact: 03/01/05

CAL-SITES: Calsites Database
Source: Department of Toxic Substance Control
Telephone: 916-323-3400
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database.

Date of Government Version: 02/07/05
Date Made Active at EDR: 04/05/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 03/01/05
Elapsed ASTM days: 35
Date of Last EDR Contact: 03/01/05

CHMIRS: California Hazardous Material Incident Report System
Source: Office of Emergency Services
Telephone: 916-845-8400
California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/03
Date Made Active at EDR: 06/25/04
Database Release Frequency: Varies
Date of Data Arrival at EDR: 05/18/04
Elapsed ASTM days: 38
Date of Last EDR Contact: 02/23/05

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-9100
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites). This listing is no longer updated by the state agency.

Date of Government Version: 04/01/01
Date Made Active at EDR: 07/26/01
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 05/29/01
Elapsed ASTM days: 58
Date of Last EDR Contact: 04/25/05

NOTIFY 65: Proposition 65 Records
Source: State Water Resources Control Board
Telephone: 916-445-3846
Proposition 65 Notification Records. NOTIFY 65 contains facility notifications about any release which could impact drinking water and thereby expose the public to a potential health risk.

Date of Government Version: 10/21/93
Date Made Active at EDR: 11/19/93
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 11/01/93
Elapsed ASTM days: 18
Date of Last EDR Contact: 04/18/05

TOXIC PITS: Toxic Pits Cleanup Act Sites
Source: State Water Resources Control Board
Telephone: 916-227-4364
Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/95
Date Made Active at EDR: 09/26/95
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 08/30/95
Elapsed ASTM days: 27
Date of Last EDR Contact: 02/01/05

SWF/LF (SWIS): Solid Waste Information System
Source: Integrated Waste Management Board
Telephone: 916-341-6320
Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 03/14/05
Date Made Active at EDR: 04/05/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 03/15/05
Elapsed ASTM days: 21
Date of Last EDR Contact: 03/15/05

WMUDS/SWAT: Waste Management Unit Database
Source: State Water Resources Control Board
Telephone: 916-227-4448
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/00
Date Made Active at EDR: 05/10/00
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 04/10/00
Elapsed ASTM days: 30
Date of Last EDR Contact: 03/07/05

LUST: Geotracker's Leaking Underground Fuel Tank Report
Source: State Water Resources Control Board
Contact: Contra Costa County Health Services Dept, (925) 646-2286
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 05/12/05
Date Made Active at EDR: 06/07/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 05/12/05
Elapsed ASTM days: 26
Date of Last EDR Contact: 04/13/05

LUST REG 1: Active Toxic Site Investigation
Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-576-2220
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/01 — Date of Data Arrival at EDR: 02/28/01
Date Made Active at EDR: 03/29/01 — Elapsed ASTM days: 29
Database Release Frequency: No Update Planned — Date of Last EDR Contact: 02/23/05

LUST REG 2: Fuel Leak List
Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457

Date of Government Version: 09/30/04 — Date of Data Arrival at EDR: 10/20/04
Date Made Active at EDR: 11/19/04 — Elapsed ASTM days: 30
Database Release Frequency: Quarterly — Date of Last EDR Contact: 04/11/05

LUST REG 3: Leaking Underground Storage Tank Database
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147

Date of Government Version: 05/19/03 — Date of Data Arrival at EDR: 05/19/03
Date Made Active at EDR: 06/02/03 — Elapsed ASTM days: 14
Database Release Frequency: No Update Planned — Date of Last EDR Contact: 02/14/05

LUST REG 4: Underground Storage Tank Leak List
Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/04 — Date of Data Arrival at EDR: 09/07/04
Date Made Active at EDR: 10/12/04 — Elapsed ASTM days: 35
Database Release Frequency: No Update Planned — Date of Last EDR Contact: 03/29/05

LUST REG 5: Leaking Underground Storage Tank Database
Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291

Date of Government Version: 04/01/05 — Date of Data Arrival at EDR: 04/28/05
Date Made Active at EDR: 05/06/05 — Elapsed ASTM days: 8
Database Release Frequency: Quarterly — Date of Last EDR Contact: 04/19/05

LUST REG 6L: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 916-542-5424
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/03 — Date of Data Arrival at EDR: 09/10/03
Date Made Active at EDR: 10/07/03 — Elapsed ASTM days: 27
Database Release Frequency: No Update Planned — Date of Last EDR Contact: 04/12/05

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-346-7491

Date of Government Version: 08/09/04 — Date of Data Arrival at EDR: 08/16/04
Date Made Active at EDR: 10/05/04 — Elapsed ASTM days: 50
Database Release Frequency: No Update Planned — Date of Last EDR Contact: 04/15/05

LUST REG 7: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-346-7491

Date of Government Version: 02/26/04
Date Made Active at EDR: 03/24/04
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 02/26/04
Elapsed ASTM days: 27
Date of Last EDR Contact: 03/29/05

LUST REG 8: Leaking Underground Storage Tanks
Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-4130
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/05
Date Made Active at EDR: 03/28/05
Database Release Frequency: Varies
Date of Data Arrival at EDR: 02/15/05
Elapsed ASTM days: 41
Date of Last EDR Contact: 02/08/05

LUST REG 9: Leaking Underground Storage Tank Report
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/01
Date Made Active at EDR: 05/21/01
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 04/23/01
Elapsed ASTM days: 28
Date of Last EDR Contact: 04/19/05

CA BOND EXP. PLAN: Bond Expenditure Plan
Source: Department of Health Services
Telephone: 916-255-2118
Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/89
Date Made Active at EDR: 08/02/94
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 07/27/94
Elapsed ASTM days: 6
Date of Last EDR Contact: 05/31/94

CA UST:

UST: Active UST Facilities
Source: SWRCB
Contact: Contra Costa County Health Services Dept, (925) 646-2286
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 04/12/05
Date Made Active at EDR: 05/06/05
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 04/13/05
Elapsed ASTM days: 23
Date of Last EDR Contact: 04/13/05

VCP: Voluntary Cleanup Program Properties
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 02/07/05
Date Made Active at EDR: 03/31/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 03/01/05
Elapsed ASTM days: 30
Date of Last EDR Contact: 03/01/05

INDIAN UST: Underground Storage Tanks on Indian Land
Source: EPA Region 9
Telephone: 415-972-3368

Date of Government Version: 04/18/05
Date Made Active at EDR: 05/31/05
Database Release Frequency: Varies
Date of Data Arrival at EDR: 05/16/05
Elapsed ASTM days: 15
Date of Last EDR Contact: 05/16/05

INDIAN LUST: Leaking Underground Storage Tanks on Indian Land
Source: Environmental Protection Agency
Telephone: 415-972-3372
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/18/05
Date Made Active at EDR: 04/13/05
Database Release Frequency: Varies
Date of Data Arrival at EDR: 03/21/05
Elapsed ASTM days: 23
Date of Last EDR Contact: 02/22/05

INDIAN LUST: Leaking Underground Storage Tanks on Indian Land
Source: EPA Region 10
Telephone: 206-553-2857
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 02/02/05
Date Made Active at EDR: 03/28/05
Database Release Frequency: Varies
Date of Data Arrival at EDR: 02/02/05
Elapsed ASTM days: 54
Date of Last EDR Contact: 01/31/05

CA FID UST: Facility Inventory Database
Source: California Environmental Protection Agency
Telephone: 916-341-5851
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/94
Date Made Active at EDR: 09/29/95
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 09/05/95
Elapsed ASTM days: 24
Date of Last EDR Contact: 12/28/98

HIST UST: Hazardous Substance Storage Container Database
Source: State Water Resources Control Board
Telephone: 916-341-5851
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/90
Date Made Active at EDR: 02/12/91
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 01/25/91
Elapsed ASTM days: 18
Date of Last EDR Contact: 07/26/01

STATE OF CALIFORNIA ASTM SUPPLEMENTAL RECORDS

AST: Aboveground Petroleum Storage Tank Facilities
Source: State Water Resources Control Board
Telephone: 916-341-5712
Registered Aboveground Storage Tanks.

Date of Government Version: 02/01/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 02/24/05
Date of Next Scheduled EDR Contact: 05/02/05

CLEANERS: Cleaner Facilities
Source: Department of Toxic Substance Control
Telephone: 916-327-4498
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 04/18/05
Database Release Frequency: Annually

Date of Last EDR Contact: 04/15/05
Date of Next Scheduled EDR Contact: 07/04/05

CA WDS: Waste Discharge System
Source: State Water Resources Control Board
Telephone: 916-341-5227
Sites which have been issued waste discharge requirements.

Date of Government Version: 03/21/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/22/05
Date of Next Scheduled EDR Contact: 06/20/05

DEED: Deed Restriction Listing
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 04/05/05
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/04/05
Date of Next Scheduled EDR Contact: 07/04/05

NFA: No Further Action Determination
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains properties at which DTSC has made a clear determination that the property does not pose a problem to the environment or to public health.

Date of Government Version: 02/07/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

EMI: Emissions Inventory Data
Source: California Air Resources Board
Telephone: 916-322-2990
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/02
Database Release Frequency: Varies

Date of Last EDR Contact: 04/22/05
Date of Next Scheduled EDR Contact: 07/18/05

WIP: Well Investigation Program Case List
Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 04/26/05
Database Release Frequency: Varies

Date of Last EDR Contact: 04/25/05
Date of Next Scheduled EDR Contact: 07/25/05

REF: Unconfirmed Properties Referred to Another Agency
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains properties where contamination has not been confirmed and which were determined as not requiring direct DTSC Site Mitigation Program action or oversight. Accordingly, these sites have been referred to another state or local regulatory agency.

Date of Government Version: 02/07/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

SCH: School Property Evaluation Program
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 02/07/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

NFE: Properties Needing Further Evaluation
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains properties that are suspected of being contaminated. These are unconfirmed contaminated properties that need to be assessed using the PEA process. PEA in Progress indicates properties where DTSC is currently conducting a PEA. PEA Required indicates properties where DTSC has determined a PEA is required, but not currently underway.

Date of Government Version: 02/07/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

SLIC: Statewide SLIC Cases
Source: State Water Resources Control Board
Contact: Contra Costa County Health Services Dept, (925) 646-2286
The Spills, Leaks, Investigations, and Cleanups (SLIC) listings includes unauthorized discharges from spills and leaks, other than from underground storage tanks or other regulated sites.

Date of Government Version: 04/12/05
Database Release Frequency: Varies
Date of Last EDR Contact: 04/13/05
Date of Next Scheduled EDR Contact: 07/11/05

SLIC REG 1: Active Toxic Site Investigations
Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220

Date of Government Version: 04/03/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 02/23/05
Date of Next Scheduled EDR Contact: 05/23/05

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 09/30/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/11/05
Date of Next Scheduled EDR Contact: 07/11/05

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 05/16/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 05/16/05
Date of Next Scheduled EDR Contact: 08/15/05

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 11/17/04
Database Release Frequency: Varies

Date of Last EDR Contact: 04/25/05
Date of Next Scheduled EDR Contact: 07/25/05

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Unregulated sites that impact groundwater or have the potential to impact groundwater.

Date of Government Version: 04/01/05
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/05/05
Date of Next Scheduled EDR Contact: 07/04/05

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583

Date of Government Version: 05/24/05
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/18/05
Date of Next Scheduled EDR Contact: 07/04/05

SLIC REG 6L: SLIC Sites
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574

Date of Government Version: 09/07/04
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 03/07/05
Date of Next Scheduled EDR Contact: 06/06/05

SLIC REG 7: SLIC List
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491

Date of Government Version: 11/24/04
Database Release Frequency: Varies

Date of Last EDR Contact: 02/22/05
Date of Next Scheduled EDR Contact: 05/23/05

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298

Date of Government Version: 07/01/04
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/06/05
Date of Next Scheduled EDR Contact: 07/04/05

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980

Date of Government Version: 09/10/04
Database Release Frequency: Annually

Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

HAZNET: Facility and Manifest Data
Source: California Environmental Protection Agency
Telephone: 916-255-1136
Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/02
Database Release Frequency: Annually

Date of Last EDR Contact: 02/17/05
Date of Next Scheduled EDR Contact: 05/09/05

LOCAL RECORDS

ALAMEDA COUNTY:

Underground Tanks
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

Date of Government Version: 02/15/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/25/05
Date of Next Scheduled EDR Contact: 07/25/05

Contaminated Sites
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 05/25/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/25/05
Date of Next Scheduled EDR Contact: 07/25/05

CONTRA COSTA COUNTY:

Site List
Source: Contra Costa Health Services Department
Telephone: 925-646-2286
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 03/04/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 02/28/05
Date of Next Scheduled EDR Contact: 05/30/05

FRESNO COUNTY:

CUPA Resources List
Source: Dept. of Community Health
Telephone: 559-445-3271
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 03/31/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 01/19/05
Date of Next Scheduled EDR Contact: 05/09/05

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Kern County Sites and Tanks Listing.

Date of Government Version: 05/10/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 05/02/05
Date of Next Scheduled EDR Contact: 09/05/05

LOS ANGELES COUNTY:

List of Solid Waste Facilities
Source: La County Department of Public Works
Telephone: 818-458-5185

Date of Government Version: 02/01/05
Database Release Frequency: Varies
Date of Last EDR Contact: 02/18/05
Date of Next Scheduled EDR Contact: 05/16/05

City of El Segundo Underground Storage Tank
Source: City of El Segundo Fire Department
Telephone: 310-524-2236

Date of Government Version: 05/31/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 05/16/05
Date of Next Scheduled EDR Contact: 08/15/05

City of Long Beach Underground Storage Tank
Source: City of Long Beach Fire Department
Telephone: 562-570-2563

Date of Government Version: 03/28/03
Database Release Frequency: Annually
Date of Last EDR Contact: 02/23/05
Date of Next Scheduled EDR Contact: 05/23/05

City of Torrance Underground Storage Tank
Source: City of Torrance Fire Department
Telephone: 310-618-2973

Date of Government Version: 03/24/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 02/28/05
Date of Next Scheduled EDR Contact: 05/16/05

City of Los Angeles Landfills
Source: Engineering & Construction Division
Telephone: 213-473-7869

Date of Government Version: 03/01/05
Database Release Frequency: Varies
Date of Last EDR Contact: 03/18/05
Date of Next Scheduled EDR Contact: 06/13/05

HMS: Street Number List
Source: Department of Public Works
Telephone: 626-458-3517
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 02/28/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 02/14/05
Date of Next Scheduled EDR Contact: 05/16/05

Site Mitigation List
Source: Community Health Services
Telephone: 323-890-7806
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 03/09/05
Database Release Frequency: Annually
Date of Last EDR Contact: 02/14/05
Date of Next Scheduled EDR Contact: 05/16/05

San Gabriel Valley Areas of Concern
Source: EPA Region 9
Telephone: 415-972-3178
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 12/31/98
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 07/06/99
Date of Next Scheduled EDR Contact: N/A

MARIN COUNTY:

Underground Storage Tank Sites
Source: Public Works Department Waste Management
Telephone: 415-499-6647
Currently permitted USTs in Marin County.

Date of Government Version: 02/08/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 01/31/05
Date of Next Scheduled EDR Contact: 05/02/05

NAPA COUNTY:

Sites With Reported Contamination
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 03/29/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/28/05
Date of Next Scheduled EDR Contact: 06/27/05

Closed and Operating Underground Storage Tank Sites
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 03/29/05
Database Release Frequency: Annually
Date of Last EDR Contact: 03/28/05
Date of Next Scheduled EDR Contact: 06/27/05

ORANGE COUNTY:

List of Underground Storage Tank Cleanups
Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 02/01/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/11/05
Date of Next Scheduled EDR Contact: 06/06/05

List of Underground Storage Tank Facilities
Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 03/01/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/11/05
Date of Next Scheduled EDR Contact: 06/06/05

List of Industrial Site Cleanups
Source: Health Care Agency
Telephone: 714-834-3446
Petroleum and non-petroleum spills.

Date of Government Version: 03/01/05
Database Release Frequency: Annually
Date of Last EDR Contact: 03/11/05
Date of Next Scheduled EDR Contact: 06/06/05

PLACER COUNTY:

Master List of Facilities
Source: Placer County Health and Human Services
Telephone: 530-889-7312
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 04/05/05
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/21/05
Date of Next Scheduled EDR Contact: 06/20/05

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Source: Department of Public Health
Telephone: 951-358-5055
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/24/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/18/05
Date of Next Scheduled EDR Contact: 07/18/05

Underground Storage Tank Tank List
Source: Health Services Agency
Telephone: 951-358-5055

Date of Government Version: 05/24/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/18/05
Date of Next Scheduled EDR Contact: 07/18/05

SACRAMENTO COUNTY:

CS - Contaminated Sites
Source: Sacramento County Environmental Management
Telephone: 916-875-8406

Date of Government Version: 04/06/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/06/05
Date of Next Scheduled EDR Contact: 08/01/05

ML - Regulatory Compliance Master List
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 03/29/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/06/05
Date of Next Scheduled EDR Contact: 08/01/05

SAN BERNARDINO COUNTY:

Hazardous Material Permits
Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 03/25/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/07/05
Date of Next Scheduled EDR Contact: 06/06/05

SAN DIEGO COUNTY:

Solid Waste Facilities
Source: Department of Health Services
Telephone: 619-338-2209
San Diego County Solid Waste Facilities.

Date of Government Version: 08/01/00 | Date of Last EDR Contact: 02/22/05
Database Release Frequency: Varies | Date of Next Scheduled EDR Contact: 05/23/05

Hazardous Materials Management Division Database
Source: Hazardous Materials Management Division
Telephone: 619-338-2268
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 05/16/05 | Date of Last EDR Contact: 04/22/05
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 07/04/05

SAN FRANCISCO COUNTY:

Local Oversite Facilities
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920

Date of Government Version: 03/09/05 | Date of Last EDR Contact: 03/07/05
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 06/06/05

Underground Storage Tank Information
Source: Department of Public Health
Telephone: 415-252-3920

Date of Government Version: 03/09/05 | Date of Last EDR Contact: 03/07/05
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 06/06/05

SAN MATEO COUNTY:

Fuel Leak List
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921

Date of Government Version: 05/05/05 | Date of Last EDR Contact: 04/11/05
Database Release Frequency: Semi-Annually | Date of Next Scheduled EDR Contact: 07/11/05

Business Inventory
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 05/12/05 | Date of Last EDR Contact: 04/11/05
Database Release Frequency: Annually | Date of Next Scheduled EDR Contact: 07/11/05

SANTA CLARA COUNTY:

Fuel Leak Site Activity Report
Source: Santa Clara Valley Water District
Telephone: 408-265-2600

Date of Government Version: 03/29/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/29/05
Date of Next Scheduled EDR Contact: 06/27/05

Hazardous Material Facilities
Source: City of San Jose Fire Department
Telephone: 408-277-4659

Date of Government Version: 01/14/05
Database Release Frequency: Annually
Date of Last EDR Contact: 03/07/05
Date of Next Scheduled EDR Contact: 06/06/05

SOLANO COUNTY:

Leaking Underground Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-784-6770

Date of Government Version: 04/18/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/18/05
Date of Next Scheduled EDR Contact: 06/13/05

Underground Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-784-6770

Date of Government Version: 04/18/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/18/05
Date of Next Scheduled EDR Contact: 06/13/05

SONOMA COUNTY:

Leaking Underground Storage Tank Sites
Source: Department of Health Services
Telephone: 707-565-6565

Date of Government Version: 04/25/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/25/05
Date of Next Scheduled EDR Contact: 07/25/05

SUTTER COUNTY:

Underground Storage Tanks
Source: Sutter County Department of Agriculture
Telephone: 530-822-7500

Date of Government Version: 01/29/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/18/05
Date of Next Scheduled EDR Contact: 07/04/05

VENTURA COUNTY:

Inventory of Illegal Abandoned and Inactive Sites
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 08/01/04
Database Release Frequency: Annually
Date of Last EDR Contact: 02/23/05
Date of Next Scheduled EDR Contact: 05/23/05

Listing of Underground Tank Cleanup Sites
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 03/01/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/18/05
Date of Next Scheduled EDR Contact: 06/13/05

Underground Tank Closed Sites List
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 03/30/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/15/05
Date of Next Scheduled EDR Contact: 07/11/05

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 03/01/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/18/05
Date of Next Scheduled EDR Contact: 06/13/05

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Source: Yolo County Department of Health
Telephone: 530-666-8646

Date of Government Version: 04/19/05
Database Release Frequency: Annually

Date of Last EDR Contact: 04/18/05
Date of Next Scheduled EDR Contact: 07/18/05

EDR PROPRIETARY HISTORICAL DATABASES

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. ©Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

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BROWNFIELDS DATABASES

VCP: Voluntary Cleanup Program Properties
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 02/07/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

US BROWNFIELDS: A Listing of Brownfields Sites
Source: Environmental Protection Agency
Telephone: 202-566-2777
Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 01/10/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/14/05
Date of Next Scheduled EDR Contact: 06/13/05

US INST CONTROL: Sites with Institutional Controls
Source: Environmental Protection Agency
Telephone: 703-603-8867
A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 01/10/05
Database Release Frequency: Varies
Date of Last EDR Contact: 04/04/05
Date of Next Scheduled EDR Contact: 07/04/05

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: PennWell Corporation
Telephone: (800) 823-6277
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

SULLENGER RANCH
DEER VALLEY RD
ANTIOCH, CA 94531

TARGET PROPERTY COORDINATES

Latitude (North):	37.940601 - 37˚ 56' 26.2"
Longitude (West):	121.769897 - 121˚ 46' 11.6"
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	608091.3
UTM Y (Meters):	4199732.5
Elevation:	269 ft. above sea level

EDR's GeoCheck Physical Setting Source Addendum has been developed to assist the environmental professional with the collection of physical setting source information in accordance with ASTM 1527-00, Section 7.2.3. Section 7.2.3 requires that a current USGS 7.5 Minute Topographic Map (or equivalent, such as the USGS Digital Elevation Model) be reviewed. It also requires that one or more additional physical setting sources be sought when (1) conditions have been identified in which hazardous substances or petroleum products are likely to migrate to or from the property, and (2) more information than is provided in the current USGS 7.5 Minute Topographic Map (or equivalent) is generally obtained, pursuant to local good commercial or customary practice, to assess the impact of migration of recognized environmental conditions in connection with the property. Such additional physical setting sources generally include information about the topographic, hydrologic, hydrogeologic, and geologic characteristics of a site, and wells in the area.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

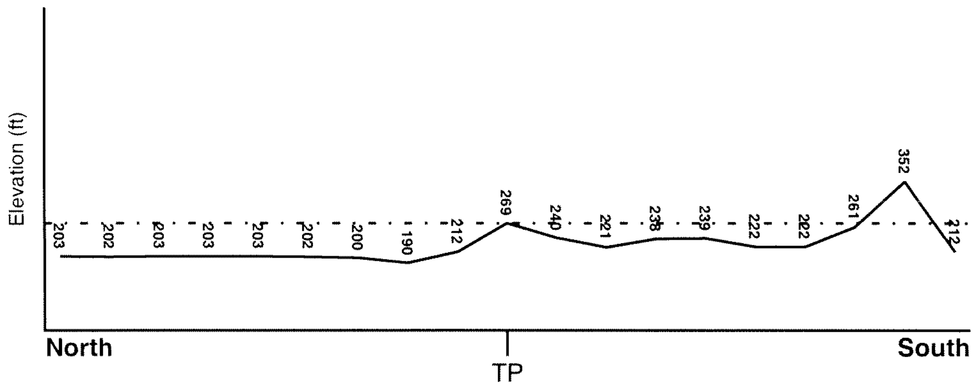
TOPOGRAPHIC INFORMATION

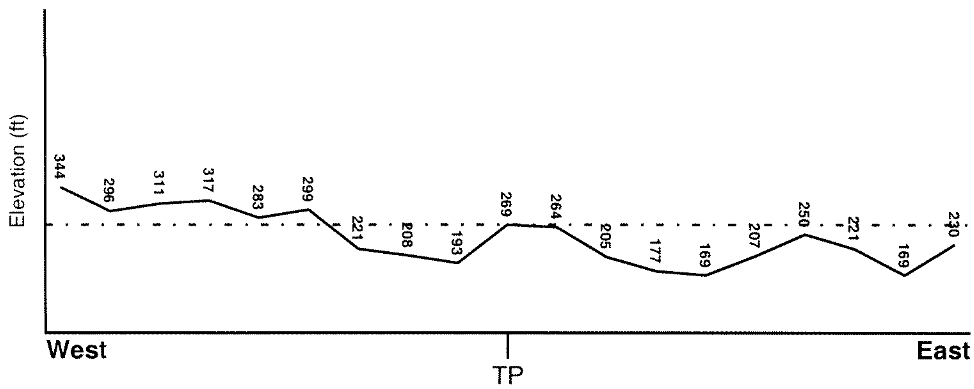
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

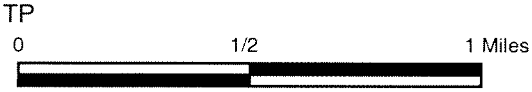
USGS Topographic Map:	37121-H7 ANTIOCH SOUTH, CA
General Topographic Gradient:	General NNE
Source:	USGS 7.5 min quad index

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 269 ft.



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
CONTRA COSTA, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 0600250335B

Additional Panels in search area: 0600250350B

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
ANTIOCH SOUTH	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius: 1.25 miles
Status: Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Cenozoic
System:	Tertiary
Series:	Eocene
Code:	Te *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	CAPAY
Soil Surface Texture:	clay
Hydrologic Group:	Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.
Soil Drainage Class:	Moderately well drained. Soils have a layer of low hydraulic conductivity, wet state high in the profile. Depth to water table is 3 to 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel:	HIGH
Depth to Bedrock Min:	> 60 inches
Depth to Bedrock Max:	> 60 inches

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	32 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.20 Min: 0.06	Max: 8.40 Min: 5.60
2	32 inches	50 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.20 Min: 0.06	Max: 8.40 Min: 6.60
3	50 inches	62 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.20 Min: 0.06	Max: 8.40 Min: 6.60

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: clay loam
silt loam
silty clay loam
sand
loam

Surficial Soil Types: clay loam
silt loam
silty clay loam
sand
loam

Shallow Soil Types: silty clay loam
sand
clay
stratified

Deeper Soil Types: clay loam
stratified
gravelly - loam
sand
clay

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

According to ASTM E 1527-00, Section 7.2.2, "one or more additional state or local sources of environmental records may be checked, in the discretion of the environmental professional, to enhance and supplement federal and state sources... Factors to consider in determining which local or additional state records, if any, should be checked include (1) whether they are reasonably ascertainable, (2) whether they are sufficiently useful, accurate, and complete in light of the objective of the records review (see 7.1.1), and (3) whether they are obtained, pursuant to local, good commercial or customary practice." One of the record sources listed in Section 7.2.2 is water well information. Water well information can be used to assist the environmental professional in assessing sources that may impact groundwater flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

STATE OIL/GAS WELL INFORMATION

DISTANCE FROM TP (Miles)	DISTANCE FROM TP (Miles)
1/2 - 1 Mile North	1/2 - 1 Mile North
1/2 - 1 Mile North	1/2 - 1 Mile North
1/2 - 1 Mile NNW	1/2 - 1 Mile North
1/2 - 1 Mile North	1/2 - 1 Mile North
1/2 - 1 Mile NNW	1/2 - 1 Mile North
1/2 - 1 Mile NNE	1/2 - 1 Mile NE
1/2 - 1 Mile NNE	1/2 - 1 Mile NE
1/4 - 1/2 Mile North	1/2 - 1 Mile NE
1/4 - 1/2 Mile NNW	1/2 - 1 Mile ENE
1/4 - 1/2 Mile NNE	1/4 - 1/2 Mile North
1/2 - 1 Mile WNW	1/4 - 1/2 Mile NW

STATE OIL/GAS WELL INFORMATION

DISTANCE FROM TP (Miles)
1/2 - 1 Mile East
1/2 - 1 Mile East
1/4 - 1/2 Mile East
1/2 - 1 Mile West
1/4 - 1/2 Mile WSW
1/2 - 1 Mile ESE
1/4 - 1/2 Mile SW
1/2 - 1 Mile WSW

DISTANCE FROM TP (Miles)
1/8 - 1/4 Mile ENE
1/4 - 1/2 Mile West
1/2 - 1 Mile West
1/8 - 1/4 Mile SSW
1/2 - 1 Mile WSW
1/4 - 1/2 Mile ESE
1/2 - 1 Mile East
1/2 - 1 Mile South

PHYSICAL SETTING SOURCE MAP - 01454086.2r

- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- (G I) Indeterminate Groundwater Flow at Location
- (G V) Groundwater Flow Varies at Location
- (H D) Closest Hydrogeological Data
- Oil, gas or related wells

TARGET PROPERTY:	Sullenger Ranch	CUSTOMER:	Engeo Inc.
ADDRESS:	Deer Valley Rd	CONTACT:	Kelsey Adams
CITY/STATE/ZIP:	Antioch CA 94531	INQUIRY #:	01454086.2r
LAT/LONG:	37.9406 / 121.7699	DATE:	June 27, 2005 2:17 pm

Direction
Distance | Database | EDR ID Number

North
1/2 - 1 Mile | **OIL_GAS** | **CA00004411**

Well Number:	5-6	Status:	Plugged and abandoned oil
API Number:	01320235	Operator:	Venada National
Latitude:	37.95478	Longitude:	-121.76884
Region:	6	Lease:	Prewett
Section:	05	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	3915.00000
Spud Date:	10/5/1984	Abandonment Date:	8/11/1989

North
1/2 - 1 Mile | **OIL_GAS** | **CA00004405**

Well Number:	34-4	Status:	Plugged and abandoned oil-directional
API Number:	01320252	Operator:	Occidental Petroleum Corp.
Latitude:	37.95467	Longitude:	-121.76773
Region:	6	Lease:	Williamson
Section:	04	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4400.00000
Spud Date:	8/19/1985	Abandonment Date:	3/27/1992

North
1/2 - 1 Mile | **OIL_GAS** | **CA00004404**

Well Number:	4	Status:	Plugged and abandoned oil-directional
API Number:	01320250	Operator:	Venturini Associates, Inc.
Latitude:	37.95416	Longitude:	-121.76701
Region:	6	Lease:	Williamson
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	3802.00000
Spud Date:	8/6/1985	Abandonment Date:	8/16/1985

North
1/2 - 1 Mile | **OIL_GAS** | **CA00004414**

Well Number:	3	Status:	Plugged and abandoned oil
API Number:	01320240	Operator:	Venturini Associates, Inc.
Latitude:	37.95403	Longitude:	-121.76773
Region:	6	Lease:	Williamson
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	3835.00000
Spud Date:	10/29/1984	Abandonment Date:	12/10/1987

Direction
Distance | Database | EDR ID Number

NNW
1/2 - 1 Mile | **OIL_GAS** | **CA00004356**

Well Number:	4	Status:	Plugged and abandoned oil
API Number:	01320292	Operator:	Venturini Associates, Inc.
Latitude:	37.95403	Longitude:	-121.77220
Region:	6	Lease:	Enea-Capitol
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4005.00000
Spud Date:	7/28/1989	Abandonment Date:	11/3/1993

North
1/2 - 1 Mile | **OIL_GAS** | **CA00004393**

Well Number:	1	Status:	Plugged and abandoned oil
API Number:	01320264	Operator:	Venturini Associates, Inc.
Latitude:	37.95397	Longitude:	-121.76914
Region:	6	Lease:	Enea
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	3920.00000
Spud Date:	8/14/1986	Abandonment Date:	9/1/1993

North
1/2 - 1 Mile | **OIL_GAS** | **CA00004423**

Well Number:	2	Status:	Plugged and abandoned oil-directional
API Number:	01320226	Operator:	Venturini Associates, Inc.
Latitude:	37.95334	Longitude:	-121.76680
Region:	6	Lease:	Williamson
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4329.00000
Spud Date:	3/7/1984	Abandonment Date:	11/20/1995

North
1/2 - 1 Mile | **OIL_GAS** | **CA00004394**

Well Number:	2	Status:	Plugged and abandoned oil
API Number:	01320265	Operator:	Venturini Associates, Inc.
Latitude:	37.95194	Longitude:	-121.76914
Region:	6	Lease:	Enea
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4058.00000
Spud Date:	11/11/1986	Abandonment Date:	8/30/1993

Direction Distance	Database	EDR ID Number

NNW
1/2 - 1 Mile **OIL_GAS** **CA00004900**

Well Number:	2-8	Status:	Completed gas
API Number:	01300034	Operator:	Occidental Petroleum Corp.
Latitude:	37.95163	Longitude:	-121.77250
Region:	6	Lease:	Enea-Capital
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	5100.00000
Spud Date:	7/1/1964	Abandonment Date:	4/7/1992

North
1/2 - 1 Mile **OIL_GAS** **CA00004377**

Well Number:	3	Status:	Plugged and abandoned oil
API Number:	01320269	Operator:	Venturini Associates, Inc.
Latitude:	37.95143	Longitude:	-121.76876
Region:	6	Lease:	Capital-Enea
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4710.00000
Spud Date:	4/11/1987	Abandonment Date:	11/2/1993

NNE
1/2 - 1 Mile **OIL_GAS** **CA00004865**

Well Number:	1-9	Status:	Plugged and abandoned-dry hole
API Number:	01300067	Operator:	SWEPI
Latitude:	37.95071	Longitude:	-121.76323
Region:	6	Lease:	Williamson
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	5000.00000
Spud Date:	10/1/1962	Abandonment Date:	7/27/1964

NE
1/2 - 1 Mile **OIL_GAS** **CA00004626**

Well Number:	22-9	Status:	Plugged and abandoned gas
API Number:	01320005	Operator:	Occidental Petroleum Corp.
Latitude:	37.94934	Longitude:	-121.75681
Region:	6	Lease:	Ginochio
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4239.00000
Spud Date:	7/7/1967	Abandonment Date:	9/26/1991

Direction Distance	Database	EDR ID Number

NNE
1/2 - 1 Mile **OIL_GAS** **CA00004866**

Well Number:	11-9	Status:	Plugged and abandoned-dry hole
API Number:	01300068	Operator:	SWEPI
Latitude:	37.94790	Longitude:	-121.76323
Region:	6	Lease:	Williamson
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	5390.00000
Spud Date:	12/22/1962	Abandonment Date:	1/1/1963

NE
1/2 - 1 Mile **OIL_GAS** **CA00004433**

Well Number:	1	Status:	Plugged and abandoned-dry hole-directional
API Number:	01320212	Operator:	Venturini Associates, Inc.
Latitude:	37.94631	Longitude:	-121.76273
Region:	6	Lease:	Williamson
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4502.00000
Spud Date:	8/27/1983	Abandonment Date:	9/5/1983

North
1/4 - 1/2 Mile **OIL_GAS** **CA00004584**

Well Number:	1	Status:	Plugged and abandoned oil
API Number:	01320051	Operator:	Venturini Associates, Inc.
Latitude:	37.94596	Longitude:	-121.76962
Region:	6	Lease:	Sullenger
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4161.00000
Spud Date:	6/16/1969	Abandonment Date:	6/6/1995

NE
1/2 - 1 Mile **OIL_GAS** **CA00004586**

Well Number:	1	Status:	Plugged and abandoned-dry hole-directional
API Number:	01320053	Operator:	Sinco Oil Corp.
Latitude:	37.94595	Longitude:	-121.75962
Region:	6	Lease:	Williamson
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4504.00000
Spud Date:	7/23/1969	Abandonment Date:	8/2/1969

Direction
Distance | Database | EDR ID Number

NNW
1/4 - 1/2 Mile | **OIL_GAS** | **CA00004567**

Well Number:	2	Status:	Plugged and abandoned-dry hole-directional
API Number:	01320079	Operator:	Sinco Oil Corp.
Latitude:	37.94560	Longitude:	-121.77217
Region:	6	Lease:	Sullenger
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4264.00000
Spud Date:	12/16/1971	Abandonment Date:	12/31/1971

ENE
1/2 - 1 Mile | **OIL_GAS** | **CA00004884**

Well Number:	4-9	Status:	Plugged and abandoned oil
API Number:	01300041	Operator:	Occidental Petroleum Corp.
Latitude:	37.94533	Longitude:	-121.75410
Region:	6	Lease:	Ginochio-Shellenberger
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4300.00000
Spud Date:	7/6/1962	Abandonment Date:	8/12/1985

NNE
1/4 - 1/2 Mile | **OIL_GAS** | **CA00004871**

Well Number:	3-9	Status:	Plugged and abandoned oil
API Number:	01300073	Operator:	Occidental Petroleum Corp.
Latitude:	37.94501	Longitude:	-121.76592
Region:	6	Lease:	Williamson
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4914.00000
Spud Date:	6/28/1963	Abandonment Date:	12/2/1993

North
1/4 - 1/2 Mile | **OIL_GAS** | **CA00004882**

Well Number:	4-8	Status:	Plugged and abandoned oil
API Number:	01300061	Operator:	Occidental Petroleum Corp.
Latitude:	37.94450	Longitude:	-121.76945
Region:	6	Lease:	Sullenger
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	5000.00000
Spud Date:	10/5/1963	Abandonment Date:	12/6/1993

Direction Distance		Database	EDR ID Number

WNW
1/2 - 1 Mile — **OIL_GAS** — **CA00004878**

Well Number:	3-8	Status:	Plugged and abandoned-dry hole
API Number:	01300057	Operator:	SWEPI
Latitude:	37.94419	Longitude:	-121.78161
Region:	6	Lease:	Qvale
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4857.00000
Spud Date:	12/5/1962	Abandonment Date:	12/21/1962

NW
1/4 - 1/2 Mile — **OIL_GAS** — **CA00004863**

Well Number:	42-8	Status:	Plugged and abandoned oil
API Number:	01300065	Operator:	Occidental Petroleum Corp.
Latitude:	37.94409	Longitude:	-121.77353
Region:	6	Lease:	Sullenger
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4396.00000
Spud Date:	1/16/1964	Abandonment Date:	12/8/1993

East
1/2 - 1 Mile — **OIL_GAS** — **CA00004887**

Well Number:	41-9	Status:	Plugged and abandoned gas-directional
API Number:	01300044	Operator:	Occidental Petroleum Corp.
Latitude:	37.94272	Longitude:	-121.75317
Region:	6	Lease:	Ginochio-Shellenberger
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4939.00000
Spud Date:	3/14/1963	Abandonment Date:	9/28/1991

ENE
1/8 - 1/4 Mile — **OIL_GAS** — **CA00004883**

Well Number:	31-9	Status:	Plugged and abandoned-dry hole
API Number:	01300062	Operator:	SWEPI
Latitude:	37.94244	Longitude:	-121.76533
Region:	6	Lease:	Sullenger
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	5000.00000
Spud Date:	8/16/1963	Abandonment Date:	8/28/1963

Direction Distance	Database	EDR ID Number

East
1/2 - 1 Mile **OIL_GAS** **CA00004925**

Well Number:	42-9	Status:	Plugged and abandoned oil
API Number:	01300016	Operator:	Occidental Petroleum Corp.
Latitude:	37.94149	Longitude:	-121.75108
Region:	6	Lease:	Ginochio-Shellenberger
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4100.00000
Spud Date:	8/29/1963	Abandonment Date:	10/17/1991

West
1/4 - 1/2 Mile **OIL_GAS** **CA00004880**

Well Number:	41-8	Status:	Plugged and abandoned-dry hole
API Number:	01300059	Operator:	SWEPI
Latitude:	37.94133	Longitude:	-121.77528
Region:	6	Lease:	Qvale
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4500.00000
Spud Date:	11/28/1963	Abandonment Date:	12/6/1963

East
1/4 - 1/2 Mile **OIL_GAS** **CA00004862**

Well Number:	33-9	Status:	Plugged and abandoned-dry hole
API Number:	01300064	Operator:	SWEPI
Latitude:	37.94120	Longitude:	-121.76273
Region:	6	Lease:	Sullenger
Section:	09	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4351.00000
Spud Date:	4/3/1964	Abandonment Date:	4/12/1964

West
1/2 - 1 Mile **OIL_GAS** **CA00004549**

Well Number:	1	Status:	Plugged and abandoned gas
API Number:	01320083	Operator:	Sinco Oil Corp.
Latitude:	37.94072	Longitude:	-121.78370
Region:	6	Lease:	Qvale
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4347.00000
Spud Date:	1/22/1972	Abandonment Date:	6/10/1988

Direction Distance	Database	EDR ID Number

West
1/2 - 1 Mile — **OIL_GAS** — **CA00004879**

Well Number:	2	Status:	Plugged and abandoned gas
API Number:	01300058	Operator:	Sinco Oil Corp.
Latitude:	37.94051	Longitude:	-121.77860
Region:	6	Lease:	Qvale
Section:	08	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4425.00000
Spud Date:	1/5/1964	Abandonment Date:	6/13/1988

SSW
1/8 - 1/4 Mile — **OIL_GAS** — **CA00004379**

Well Number:	2	Status:	Plugged and abandoned oil
API Number:	01320271	Operator:	Venturini Associates, Inc.
Latitude:	37.93896	Longitude:	-121.76963
Region:	6	Lease:	Ginochio
Section:	17	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4300.00000
Spud Date:	7/5/1987	Abandonment Date:	4/22/1993

WSW
1/4 - 1/2 Mile — **OIL_GAS** — **CA00004912**

Well Number:	51-17	Status:	Plugged and abandoned gas
API Number:	01300024	Operator:	Venturini Associates, Inc.
Latitude:	37.93880	Longitude:	-121.77596
Region:	6	Lease:	Ginochio
Section:	17	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4219.00000
Spud Date:	9/12/1963	Abandonment Date:	8/25/1986

WSW
1/2 - 1 Mile — **OIL_GAS** — **CA00004907**

Well Number:	41-17	Status:	Plugged and abandoned gas
API Number:	01300019	Operator:	Venturini Associates, Inc.
Latitude:	37.93879	Longitude:	-121.77839
Region:	6	Lease:	Ginochio
Section:	17	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4293.00000
Spud Date:	10/1/1963	Abandonment Date:	8/6/1984

Direction Distance	Database	EDR ID Number

ESE
1/2 - 1 Mile — **OIL_GAS** — **CA00004885**

Well Number:	21-16	Status:	Plugged and abandoned-dry hole
API Number:	01300042	Operator:	SWEPI
Latitude:	37.93862	Longitude:	-121.75704
Region:	6	Lease:	Ginochio-Shellenberger
Section:	16	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4780.00000
Spud Date:	7/17/1963	Abandonment Date:	7/29/1963

ESE
1/4 - 1/2 Mile — **OIL_GAS** — **CA00004903**

Well Number:	1-16	Status:	Plugged and abandoned-dry hole
API Number:	01300037	Operator:	Occidental Petroleum Corp.
Latitude:	37.93858	Longitude:	-121.76027
Region:	6	Lease:	Ginochio
Section:	16	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4535.00000
Spud Date:	5/17/1963	Abandonment Date:	5/14/1992

SW
1/4 - 1/2 Mile — **OIL_GAS** — **CA00004376**

Well Number:	1	Status:	Plugged and abandoned oil
API Number:	01320268	Operator:	Venturini Associates, Inc.
Latitude:	37.93816	Longitude:	-121.77231
Region:	6	Lease:	Ginochio
Section:	17	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4337.00000
Spud Date:	3/31/1987	Abandonment Date:	6/26/1990

East
1/2 - 1 Mile — **OIL_GAS** — **CA00004895**

Well Number:	2-16	Status:	116
API Number:	01300040	Operator:	Occidental Petroleum Corp.
Latitude:	37.93801	Longitude:	-121.75190
Region:	6	Lease:	Ginochio-Shellenberger
Section:	16	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4746.00000
Spud Date:	12/1/1962	Abandonment Date:	12/17/1993

Direction Distance	Database	EDR ID Number

WSW
1/2 - 1 Mile | **OIL_GAS** | **CA00004911**

Well Number:	32-17	Status:	Plugged and abandoned-dry hole-directional
API Number:	01300023	Operator:	Sinco Oil Corp.
Latitude:	37.93691	Longitude:	-121.78064
Region:	6	Lease:	Ginochio
Section:	17	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4296.00000
Spud Date:	2/7/1964	Abandonment Date:	2/27/1964

South
1/2 - 1 Mile | **OIL_GAS** | **CA00004913**

Well Number:	85-17	Status:	Plugged and abandoned-dry hole-directional
API Number:	01300025	Operator:	Occidental Petroleum Corp.
Latitude:	37.93151	Longitude:	-121.76913
Region:	6	Lease:	Ginochio
Section:	17	Township:	01N
Range:	02E	Map Number:	608
Base and Meridian:	Mount Diablo	Total Depth:	4483.00000
Spud Date:	10/23/1963	Abandonment Date:	11/5/1963

AREA RADON INFORMATION

Federal EPA Radon Zone for CONTRA COSTA County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for CONTRA COSTA COUNTY, CA

Number of sites tested: 55

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.760 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.300 pCi/L	100%	0%	0%
Basement	0.525 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002. 7.5-Minute DEMs correspond to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^R Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STATE RECORDS

California Drinking Water Quality Database
Source: Department of Health Services
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations for District 2, 3, 5 and 6
Source: Department of Conservation
Telephone: 916-323-1779

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

APPENDIX B

Preliminary Title Report

2nd Supplemental report

First American Title

6665 Owens Drive
Pleasanton, CA 94588

Roberta Mantzouris
Centex Homes
2527 Camino Ramon, Suite 100
San Ramon, CA 94583
Phone: (925) 415-1600

Escrow Officer:	Michelle Chan (MC)
Phone:	(925) 460-8228
Fax No.:	(925) 463-9683
E-Mail:	mlchan@firstam.com
Title Officer:	Sue Pratt
Phone:	(925) 356-7048
Fax No.:	(925) 680-5239
E-Mail:	spratt@firstam.com
Buyer:	Centex Homes
Owner:	Albers, et al
Property:	APN: 057-042-006, 057-050-005

PRELIMINARY REPORT

In response to the above referenced application for a policy of title insurance, this company hereby reports that it is prepared to issue, or cause to be issued, as of the date hereof, a Policy or Policies of Title Insurance describing the land and the estate or interest therein hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an Exception below or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations of said Policy forms.

The printed Exceptions and Exclusions from the coverage of said Policy or Policies are set forth in Exhibit A attached. Copies of the Policy forms should be read. They are available from the office which issued this report.

Please read the exceptions shown or referred to below and the exceptions and exclusions set forth in Exhibit A of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects, and encumbrances affecting title to the land.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance, a Binder or Commitment should be requested.

Dated as of May 23, 2005 at 7:30 A.M.

The form of Policy of title insurance contemplated by this report is:

1992 ALTA Owner's Policy (10-17-92)

A specific request should be made if another form or additional coverage is desired.

Title to said estate or interest at the date hereof is vested in:

Monte Albers and Lucia Albers, co-trustees of the Monte Albers and Lucia Albers Trust, dated June 4, 1985, as to an undivided 20% interest; Hillside Group LLC, a California limited liability company as to an undivided 30% interest; and John T. Camara and Margaret Camara, his wife, as joint tenants, as to an undivided 50% interest

The estate or interest in the land hereinafter described or referred to covered by this Report is:

A fee.

The Land referred to herein is described as follows:

(See attached Legal Description)

At the date hereof exceptions to coverage in addition to the printed Exceptions and Exclusions in said policy form would be as follows:

1. General and special taxes and assessments for the fiscal year 2005-2006, a lien not yet due or payable.

2. The lien of supplemental taxes, if any, assessed pursuant to Chapter 3.5 commencing with Section 75 of the California Revenue and Taxation Code.

3. The lien of bonds and assessment liens, if applicable, collected with the general and special taxes.

4. Any easement for water course over that portion of premises lying within Sand Creek.

5. An easement for telephone and telegraph lines and incidental purposes in the document recorded April 25, 1926 as Book 495 of Deeds, Page 30 of Official Records.

6. An easement for pole lines and incidental purposes in the document recorded April 5, 1929 as Book 176, Page 311 of Official Records.

7. An easement for pipe lines, telegraph or telephone lines and incidental purposes in the document recorded January 29, 1930 as Book 226, Page 34 of Official Records.

Document(s) declaring modifications thereof recorded April 9, 1930 as Book 223, Page 380 of Official Records.

8. An easement for pipe lines and telegraph or telephone lines and incidental purposes in the document recorded November 20, 1945 as Book 857, Page 123 and September 7, 1945, Book 824, Page 97 of Official Records.

9. An easement for pole lines, crossarms, anchors and guys and incidental purposes in the document recorded August 12, 1953 as Book 2174, Page 291 of Official Records.

   The exact location of said easement is not defined of record.

10. Intentionally deleted

11. Intentionally deleted

12. An easement for pipe lines and incidental purposes in the document recorded September 12, 1983 as Book 11429, Page 72 of Official Records.

13. The following matters shown or disclosed by the filed or recorded map referred to in the legal description:

   "Building setback line-no permanent structures shall be constructed within 50 ft.; measured from the Toe of the Creek Bank. The approx. location of the centerline of Sand Creek is shown on the filed Map."

14. An easement shown or dedicated on the Map as referred to in the legal description
   For: Limits of Alquist-Priolo Special Study Zone and incidental purposes. and incidental purposes.

15. An easement shown or dedicated on the Map as referred to in the legal description
   For: Roadway and incidental purposes.

16. Intentionally deleted

17. Rights of parties in possession.

INFORMATIONAL NOTES

1. Taxes for proration purposes only for the fiscal year 2004-2005 (SECURED).

First Installment:	$5,763.26, PAID
Second Installment:	$5,763.26, PAID
Tax Rate Area:	01-132
APN:	057-050-005-8

2. Taxes for proration purposes only for the fiscal year 2004-2005 (SECURED).

First Installment:	$1,763.93, PAID
Second Installment:	$1,763.93, PAID
Tax Rate Area:	01-132
APN:	057-042-006-7

3. According to the public records, there has been no conveyance of the land within a period of twenty four months prior to the date of this report, except as follows:

A document recorded OCTOBER 25, 2004 as INSTRUMENT NO. 2004408282 of Official Records.

From:	MONTE ALBERS AND LUCIA ALBERS, CO-TRUSTEES OF THE MONTE ALBERS AND LUCIA ALBERS TRUST DATED JUNE 4, 1985
To:	HILLSIDE GROUP LLC, A CALIFORNIA LIMITED LIABILITY COMPANY

A document recorded NOVEMBER 08, 2004 as INSTRUMENT NO. 2004429047 of Official Records.

From:	HILLSIDE GROUP LLC, A CALIFORNIA LIMITED LIABILITY COMPANY
To:	MONTE ALBERS AND LUCIA ALBERS, CO-TRUSTEES OF THE MONTE ALBERS AND LUCIA ALBERS TRUST DATED JUNE 4, 1985, AS TO A 20% UNDIVIDED INTEREST

The map attached, if any, may or may not be a survey of the land depicted hereon. First American expressly disclaims any liability for loss or damage which may result from reliance on this map except to the extent coverage for such loss or damage is expressly provided by the terms and provisions of the title insurance policy, if any, to which this map is attached.

LEGAL DESCRIPTION

Real property in the City of Antioch, County of Contra Costa, State of California, described as follows:

Parcel D as shown on the Parcel Map M.S. 55-83, filed May 14, 1985, Book 116 of Parcel Maps, Page 1, Contra Costa County Records.

EXCEPTING THEREFROM:

The parcel of land described in the Deed to John T. Camara, et ux, recorded July 23, 1987, Book 13791, Page 835, Official Records, said Parcel of land being also shown on the Record of Survey Lot Line Adjustment filed June 30, 1987, Book 83 of Licensed Surveyor's Maps, Page 50, Contra Costa County Records.

APN: 057-050-005-8 and 057-042-006-7

NOTICE

Section 12413.1 of the California Insurance Code, effective January 1, 1990, requires that any title insurance company, underwritten title company, or controlled escrow company handling funds in an escrow or sub-escrow capacity, wait a specified number of days after depositing funds, before recording any documents in connection with the transaction or disbursing funds. This statute allows for funds deposited by wire transfer to be disbursed the same day as deposit. In the case of cashier's checks or certified checks, funds may be disbursed the next day after deposit. In order to avoid unnecessary delays of three to seven days, or more, please use wire transfer, cashier's checks, or certified checks whenever possible.

If you have any questions about the effect of this new law, please contact your local First American Office for more details.

EXHIBIT A
LIST OF PRINTED EXCEPTIONS AND EXCLUSIONS (BY POLICY TYPE)

1. CALIFORNIA LAND TITLE ASSOCIATION STANDARD COVERAGE POLICY - 1990
SCHEDULE B

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records. Proceedings by a public agency which may result in taxes or assessments, or notice of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.
3. Easements, liens or encumbrances, or claims thereof, which are not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the public records.

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
   (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims or other matters:
   (a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;
   (b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
   (c) resulting in no loss or damage to the insured claimant;
   (d) attaching or created subsequent to Date of Policy; or
   (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage or for the estate or interest insured by this policy.
4. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with applicable "doing business" laws of the state in which the land is situated.
5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.
6. Any claim, which arises out of the transaction vesting in the insured the estate or interest insured by their policy or the transaction creating the interest of the insured lender, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws.

2. AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY FORM B - 1970
SCHEDULE OF EXCLUSIONS FROM COVERAGE

1. Any law, ordinance or governmental regulation (including but not limited to building and zoning ordinances) restricting or regulating or prohibiting the occupancy, use or enjoyment of the land, or regulating the character, dimensions or location of any improvement now or hereafter erected on the land, or prohibiting a separation in ownership or a reduction in the dimensions of area of the land, or the effect of any violation of any such law, ordinance or governmental regulation.
2. Rights of eminent domain or governmental rights of police power unless notice of the exercise of such rights appears in the public records at Date of Policy.
3. Defects, liens, encumbrances, adverse claims, or other matters (a) created, suffered, assumed or agreed to by the insured claimant; (b) not known to the Company and not shown by the public records but known to the insured claimant either at Date of Policy or at the date such claimant acquired an estate or interest insured by this policy and not disclosed in writing by the insured claimant to the Company prior to the date such insured claimant became an insured hereunder; (c) resulting in no loss or damage to the insured claimant; (d) attaching or

created subsequent to Date of Policy; or (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the estate or interest insured by this policy.

3. AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY FORM B - 1970
WITH REGIONAL EXCEPTIONS

When the American Land Title Association policy is used as a Standard Coverage Policy and not as an Extended Coverage Policy the exclusions set forth in paragraph 2 above are used and the following exceptions to coverage appear in the policy.

SCHEDULE B

This policy does not insure against loss or damage by reason of the matters shown in parts one and two following:
Part One

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.
3. Easements, claims of easement or encumbrances which are not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.
5. Unpatented mining claims; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
6. Any lien, or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the public records.

4. AMERICAN LAND TITLE ASSOCIATION LOAN POLICY - 1970
WITH A.L.T.A. ENDORSEMENT FORM 1 COVERAGE
SCHEDULE OF EXCLUSIONS FROM COVERAGE

1. Any law, ordinance or governmental regulation (including but not limited to building and zoning ordinances) restricting or regulating or prohibiting the occupancy, use or enjoyment of the land, or regulating the character, dimensions or location of any improvement now or hereafter erected on the land, or prohibiting a separation in ownership or a reduction in the dimensions or area of the land, or the effect of any violation of any such law ordinance or governmental regulation.
2. Rights of eminent domain or governmental rights of police power unless notice of the exercise of such rights appears in the public records at Date of Policy.
3. Defects, liens, encumbrances, adverse claims, or other matters (a) created, suffered, assumed or agreed to by the insured claimant, (b) not known to the Company and not shown by the public records but known to the insured claimant either at Date of Policy or at the date such claimant acquired an estate or interest insured by this policy or acquired the insured mortgage and not disclosed in writing by the insured claimant to the Company prior to the date such insured claimant became an insured hereunder, (c) resulting in no loss or damage to the insured claimant; (d) attaching or created subsequent to Date of Policy (except to the extent insurance is afforded herein as to any statutory lien for labor or material or to the extent insurance is afforded herein as to assessments for street improvements under construction or completed at Date of Policy).
4. Unenforceability of the lien of the insured mortgage because of failure of the insured at Date of Policy or of any subsequent owner of the indebtedness to comply with applicable "doing business" laws of the state in which the land is situated.

5. AMERICAN LAND TITLE ASSOCIATION LOAN POLICY - 1970
WITH REGIONAL EXCEPTIONS

When the American Land Title Association Lenders Policy is used as a Standard Coverage Policy and not as an Extended Coverage Policy, the exclusions set forth in paragraph 4 above are used and the following exceptions to coverage appear in the policy.

SCHEDULE B

This policy does not insure against loss or damage by reason of the matters shown in parts one and two following:
Part One

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.
3. Easements, claims of easement or encumbrances which are not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.
5. Unpatented mining claims; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
6. Any lien, or right to a lien, for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records.

6. AMERICAN LAND TITLE ASSOCIATION LOAN POLICY - 1992 WITH A.L.T.A. ENDORSEMENT FORM 1 COVERAGE EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy;
(b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims, or other matters:
(a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;
(b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
(c) resulting in no loss or damage to the insured claimant;
(d) attaching or created subsequent to Date of Policy (except to the extent that this policy insures the priority of the lien of the insured mortgage over any statutory lien for services, labor or material or the extent insurance is afforded herein as to assessments for street improvements under construction or completed at date of policy); or
(e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage.
4. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with the applicable "doing business" laws of the state in which the land is situated.
5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.
6. Any statutory lien for services, labor or materials (or the claim of priority of any statutory lien for services, labor or materials over the lien of the insured mortgage) arising from an improvement or work related to the land which is contracted for and commenced subsequent to Date of Policy and is not financed in whole or in part by proceeds of the indebtedness secured by the insured mortgage which at Date of Policy the insured has advanced or is obligated to advance.
7. Any claim, which arises out of the transaction creating the interest of the mortgagee insured by this policy, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that is based on:
(i) the transaction creating the interest of the insured mortgagee being deemed a fraudulent conveyance or fraudulent transfer; or
(ii) the subordination of the interest of the insured mortgagee as a result of the application of the doctrine of equitable subordination; or
(iii) the transaction creating the interest of the insured mortgagee being deemed a preferential transfer except where the preferential transfer results from the failure:
(a) to timely record the instrument of transfer; or
(b) of such recordation to impart notice to a purchaser for value or a judgment or lien creditor.

7. AMERICAN LAND TITLE ASSOCIATION LOAN POLICY - 1992 WITH REGIONAL EXCEPTIONS

When the American Land Title Association policy is used as a Standard Coverage Policy and not as an Extended Coverage Policy the exclusions set forth in paragraph 6 above are used and the following exceptions to coverage appear in the policy.

SCHEDULE B

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.
3. Easements, claims of easement or encumbrances which are not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.
5. Unpatented mining claims; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
6. Any lien, or right to a lien, for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records.

8. AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY - 1992

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
(b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims, or other matters:
(a) created, suffered, assumed or agreed to by the insured claimant;
(b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
(c) resulting in no loss or damage to the insured claimant;
(d) attaching or created subsequent to Date of Policy; or
(e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the estate or interest insured by this policy.
4. Any claim, which arises out of the transaction vesting in the insured the estate or interest insured by this policy, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that is based on:
(i) the transaction creating the estate or interest insured by this policy being deemed a fraudulent conveyance or fraudulent transfer; or
(ii) the transaction creating the estate or interest insured by this policy being deemed a preferential transfer except where the preferential transfer results from the failure:
(a) to timely record the instrument of transfer; or
(b) of such recordation to impart notice to a purchaser for value or a judgment or lien creditor.

9. AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY - 1992 WITH REGIONAL EXCEPTIONS

When the American Land Title Association policy is used as a Standard Coverage Policy and not as an Extended Coverage Policy the exclusions set forth in paragraph 8 above are used and the following exceptions to coverage appear in the policy.

SCHEDULE B

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:
Part One:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.
3. Easements, claims of easement or encumbrances which are not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.
5. Unpatented mining claims; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
6. Any lien, or right to a lien, for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records.

10. AMERICAN LAND TITLE ASSOCIATION RESIDENTIAL TITLE INSURANCE POLICY - 1987 EXCLUSIONS

In addition to the Exceptions in Schedule B, you are not insured against loss, costs, attorneys' fees and expenses resulting from:

1. Governmental police power, and the existence or violation of any law or government regulation. This includes building and zoning ordinances and also laws and regulations concerning:
* land use
* land division
* improvements on the land
* environmental protection

This exclusion does not apply to violations or the enforcement of these matters which appear in the public records at Policy Date.
This exclusion does not limit the zoning coverage described in items 12 and 13 of Covered Title Risks.

2. The right to take the land by condemning it, unless:
 * a notice of exercising the right appears in the public records on the Policy Date
 * the taking happened prior to the Policy Date and is binding on you if you bought the land without knowing of the taking.
3. Title Risks:
 * that are created, allowed, or agreed to by you
 * that are known to you, but not to us, on the Policy Date - unless they appeared in the public records
 * that result in no loss to you
 * that first affect your title after the Policy Date - this does not limit the labor and material lien coverage in Item 8 of Covered Title Risks
4. Failure to pay value for your title.
5. Lack of a right:
 * to any land outside the area specifically described and referred to in Item 3 of Schedule A, or
 * in streets, alleys, or waterways that touch your land
 This exclusion does not limit the access coverage in Item 5 of Covered Title Risks.

11. EAGLE PROTECTION OWNER'S POLICY

CLTA HOMEOWNER'S POLICY OF TITLE INSURANCE - 1998
ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE - 1998

Covered Risks 14 (Subdivision Law Violation). 15 (Building Permit). 16 (Zoning) and 18 (Encroachment of boundary walls or fences) are subject to Deductible Amounts and Maximum Dollar Limits of Liability

EXCLUSIONS

In addition to the Exceptions in Schedule B, you are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of any law or government regulation. This includes ordinances, laws and regulations concerning:

a. building	b. zoning
c. land use	d. improvements on the land
e. land division	f. environmental protection

 This exclusion does not apply to violations or the enforcement of these matters if notice of the violation or enforcement appears in the Public Records at the Policy Date.
 This exclusion does not limit the coverage described in Covered Risk 14, 15, 16, 17 or 24.
2. The failure of Your existing structures, or any part of them, to be constructed in accordance with applicable building codes. This Exclusion does not apply to violations of building codes if notice of the violation appears in the Public Records at the Policy Date.
3. The right to take the Land by condemning it, unless:
 a. a notice of exercising the right appears in the Public Records at the Policy Date; or
 b. the taking happened before the Policy Date and is binding on You if You bought the Land without Knowing of the taking.
4. Risks:
 a. that are created, allowed, or agreed to by You, whether or not they appear in the Public Records;
 b. that are Known to You at the Policy Date, but not to Us, unless they appear in the Public Records at the Policy Date;
 c. that result in no loss to You; or
 d. that first occur after the Policy Date - this does not limit the coverage described in Covered Risk 7, 8.d, 22, 23, 24 or 25.
5. Failure to pay value for Your Title.
6. Lack of a right:
 a. to any Land outside the area specifically described and referred to in paragraph 3 of Schedule A; and
 b. in streets, alleys, or waterways that touch the Land.
 This exclusion does not limit the coverage described in Covered Risk 11 or 18.

12. SECOND GENERATION EAGLE LOAN POLICY AMERICAN LAND TITLE ASSOCIATION EXPANDED COVERAGE RESIDENTIAL LOAN POLICY (10/13/01)

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the Land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the Land; (iii) a separation in ownership or a change in the dimensions or area of the Land or any parcel of which the Land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the Land has been recorded in the Public Records at Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 12, 13, 14 and 16 of this policy.
(b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the Public Records at Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 12, 13, 14 and 16 of this policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the Public Records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without Knowledge.
3. Defects, liens, encumbrances, adverse claims or other matters:
(a) created, suffered, assumed or agreed to by the Insured Claimant;
(b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
(c) resulting in no loss or damage to the Insured Claimant;
(d) attaching or created subsequent to Date of Policy (this paragraph does not limit the coverage provided under Covered Risks 8, 16, 18, 19, 20, 21, 22, 23, 24, 25 and 26); or
(e) resulting in loss or damage which would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of the Insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with applicable doing business laws of the state in which the Land is situated.
5. Invalidity or unenforceability of the lien of the Insured Mortgage, or claim thereof, which arises out of the transaction evidenced by the Insured Mortgage and is based upon usury, except as provided in Covered Risk 27, or any consumer credit protection or truth in lending law.
6. Real property taxes or assessments of any governmental authority which become a lien on the Land subsequent to Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 7, 8 (e) and 26.
7. Any claim of invalidity, unenforceability or lack of priority of the lien of the Insured Mortgage as to advances or modifications made after the Insured has Knowledge that the vestee shown in Schedule A is no longer the owner of the estate or interest covered by this policy. This exclusion does not limit the coverage provided in Covered Risk 8.
8. Lack of priority of the lien of the Insured Mortgage as to each and every advance made after Date of Policy, and all interest charged thereon, over liens, encumbrances and other matters affecting title, the existence of which are Known to the Insured at:
(a) The time of the advance; or
(b) The time a modification is made to the terms of the Insured Mortgage which changes the rate of interest charged, if the rate of interest is greater as a result of the modification than it would have been before the modification.
This exclusion does not limit the coverage provided in Covered Risk 8.
9. The failure of the residential structure, or any portion thereof to have been constructed before, on or after Date of Policy in accordance with applicable building codes. This exclusion does not apply to violations of building codes if notice of the violation appears in the Public Records at Date of Policy.

SCHEDULE B

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. The following existing statutes, reference to which are made part of the ALTA 8.1 Environmental Protection Lien Endorsement incorporated into this Policy following item 28 of Covered Risks: NONE.

13. SECOND GENERATION EAGLE LOAN POLICY AMERICAN LAND TITLE ASSOCIATION EXPANDED COVERAGE RESIDENTIAL LOAN POLICY (10/13/01) WITH REGIONAL EXCEPTIONS

When the American Land Title Association loan policy with EAGLE Protection Added is used as a Standard Coverage Policy and not as an Extended Coverage Policy the exclusions set forth in paragraph 12 above are used and the following exceptions to coverage appear in the policy.

SCHEDULE B

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:
Part One:
1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.
3. Easements, claims of easement or encumbrances which are not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.

5. Unpatented mining claims; reservations or exceptions in patents or in acts authorizing the issuance thereof; water rights, claims or title to water.
6. Any lien, or right to a lien, for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records.

Part Two:

1. The following existing statutes, reference to which are made part of the ALTA 8.1 Environmental Protection Lien Endorsement incorporated into this Policy following item 28 of Covered Risks: None.

PRIVACY POLICY

We Are Committed to Safeguarding Customer Information

In order to better serve your needs now and in the future, we may ask you to provide us with certain information. We understand that you may be concerned about what we will do with such information – particularly any personal or financial information. We agree that you have a right to know how we will utilize the personal information you provide to us. Therefore, together with our parent company, The First American Corporation, we have adopted this Privacy Policy to govern the use and handling of your personal information.

Applicability

This Privacy Policy governs our use of the information which you provide to us. It does not govern the manner in which we may use information we have obtained from any other source, such as information obtained from a public record or from another person or entity. First American has also adopted broader guidelines that govern our use of personal information regardless of its source. First American calls these guidelines its *Fair Information Values*, a copy of which can be found on our website at www.firstam.com.

Types of Information

Depending upon which of our services you are utilizing, the types of nonpublic personal information that we may collect include:

- Information we receive from you on applications, forms and in other communications to us, whether in writing, in person, by telephone or any other means;
- Information about your transactions with us, our affiliated companies, or others; and
- Information we receive from a consumer reporting agency.

Use of Information

We request information from you for our own legitimate business purposes and not for the benefit of any nonaffiliated party. Therefore, we will not release your information to nonaffiliated parties except: (1) as necessary for us to provide the product or service you have requested of us; or (2) as permitted by law. We may, however, store such information indefinitely, including the period after which any customer relationship has ceased. Such information may be used for any internal purpose, such as quality control efforts or customer analysis. We may also provide all of the types of nonpublic personal information listed above to one or more of our affiliated companies. Such affiliated companies include financial service providers, such as title insurers, property and casualty insurers, and trust and investment advisory companies, or companies involved in real estate services, such as appraisal companies, home warranty companies, and escrow companies. Furthermore, we may also provide all the information we collect, as described above, to companies that perform marketing services on our behalf, on behalf of our affiliated companies, or to other financial institutions with whom we or our affiliated companies have joint marketing agreements.

Former Customers

Even if you are no longer our customer, our Privacy Policy will continue to apply to you.

Confidentiality and Security

We will use our best efforts to ensure that no unauthorized parties have access to any of your information. We restrict access to nonpublic personal information about you to those individuals and entities who need to know that information to provide products or services to you. We will use our best efforts to train and oversee our employees and agents to ensure that your information will be handled responsibly and in accordance with this Privacy Policy and First American's *Fair Information Values*. We currently maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

APPENDIX C

Environmental Site Assessment Questionnaire

ENGEO
INCORPORATED
2010 Crow Canyon Place
Suite 250
San Ramon, CA 94583
(925) 866-9000
Fax (925) 866-0199
Attn: Kelsey Adams

ENVIRONMENTAL SITE ASSESSMENT QUESTIONNAIRE

To evaluate the potential for environmentally related concerns associated with the property in question, we require the following information prior to the site walkover. In most cases, this information is crucial to the formulation of a competent site assessment plan so your prompt cooperation is appreciated.

1. Contact person at law, lending or insurance firm and telephone number.
   N/A

2. Contact person at property in question (if appropriate) and telephone number. Is there a local contractor we should contact?
   Grant Gibson (CBG) 925-866-6322

3. Present property owner, date of acquisition, deed number and those known to be in the chain of title. Is a chain-of-title available? If so, from whom?
   Lucia Albers

4. Property acreage and lot numbers (if appropriate), including tax map identification.
   104 ac.

5. Are site plans, as-builts, or other property maps available? If so, from whom?
   Grant Gibson (CBG) 925-866-6322

6. Present use of property and intended use.
   Fallow

7. Knowledge of past use of property.
   Fallow

8. Neighboring property uses.

		Owner	
9. Is the *property* or any *adjoining property* used for an industrial use?	Yes	No	Unk
10. To the best of your knowledge, has the *property* or any *adjoining property* been used for an industrial use in the past?	Yes	No	Unk
11. Is the *property* or any *adjoining property* used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?	Yes	No	Unk
12. To the best of your knowledge has the *property* or any *adjoining property* been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?	Yes	No	Unk
13. Are there currently, or to the best of your knowledge have there been previously, any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of greater than 5 gal in volume or 50 gal in the aggregate, stored on or used at the *property* or at the facility?	Yes	No	Unk
14. Are there currently, or to the best of your knowledge have been previously, any industrial *drums* (typically 55 gal) or sacks of chemicals located on the property or at the facility?	Yes	No	Unk
15. Has *fill dirt* been brought onto the property that originated from a contaminated site or that is of an unknown origin?	Yes	No	Unk
16. Are there currently, or to the best of you knowledge have there been previously, any *pits, ponds, or lagoons* located on the *property* in connection with waste treatment or waste disposal?	Yes	No	Unk
17. Is there currently, or to the best of your knowledge has there been previously, any stained soil on the *property*?	Yes	No	Unk
18. Are there currently, or to the best of your knowledge have there been previously, any registered or unregistered storage tanks (above or underground) located on the *property*?	Yes	No	Unk
19. Are there currently, or to the best of your knowledge have there been previously, any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the *property* or adjacent to any structure located on the *property*?	Yes	No	Unk
20. Are there currently, or to the best of your knowledge have there been previously, any flooring, drains, or walls located within the facility that are stained by substances other than water or are emitting foul odors?	Yes	No	Unk
21. Are there any domestic, irrigation or monitoring wells on the property?	Yes	No	Unk
22. If the *property* is served by a private well or non-public water system, have contaminants been identified in the well or system that exceed guidelines applicable to the water system or has the well been designated as contaminated by any government environmental/health agency?	Yes	No	Unk
23. Does the *owner* or *occupant* of the *property* have any knowledge of *environmental liens* or governmental notification relating to past or	Yes	No	Unk

	Owner		
recurrent violations of environmental laws with respect to the *property* or any facility located on the *property*?			
24. Has the *owner* or *occupant* of the *property* been informed of the past or current existence of *hazardous substances* or *petroleum products* or environmental violations with respect to the *property* or any facility located on the *property*?	Yes	No	Unk
25. Does the *owner* or *occupant* of the *property* have any knowledge of any *environmental site assessment* of the *property* or facility that indicated the presence of *hazardous substances* or *petroleum products* on, or contamination of, the *property* or recommended further assessment of the *property*?	Yes	No	Unk
26. Does the *owner* or *occupant* of the *property* know of any past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any *hazardous substance* or *petroleum products* involving the *property* by any owner or occupant of the *property*?	Yes	No	Unk
27. Is there an active or abandoned on-site septic system in place?	Yes	No	Unk
28. Does the *property* discharge waste water on or adjacent to the *property* other than storm water into a sanitary sewer system?	Yes	No	Unk
29. To the best of your knowledge, have any *hazardous substances* or *petroleum products*, unidentified waste materials, tires, automotive or industrial batteries or any other waste materials been dumped above grade, buried and/or burned on the *property*?	Yes	No	Unk
30. Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCBs?	Yes	No	Unk

[1]Unk="unknown" or "no response"

Preparer Name: John Buller

Company: Centex Homes

Title: Land Development Manager

Date: June 29, 2005

APPENDIX D

PRELIMINARY STORMWATER CONTROL PLAN

Preliminary
Stormwater Control Plan

ALBERS PROPERTY
Subdivision 9515

CITY OF ANTIOCH, CALIFORNIA

Dated: April 26, 2021

1st Submittal

Prepared For:

Monte Albers and Lucia Albers Trust & Elizabeth Ann Iannaccone Living Trust

Prepared By:

CARLSON, BARBEE & GIBSON, Inc.

CIVIL ENGINEERS • SURVEYORS • PLANNERS

2633 CAMINO RAMON, SUITE 350 • SAN RAMON, CALIFORNIA 94583 • (925) 866-0322 • www.cbandg.com

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TABLE OF CONTENTS

Tables

Appendices

I. PROJECT DATA

Table 1. Project Data

Project Name/Number	Albers Property (Subdivision 9515)
Application Submittal Date	May 23, 2019
Project Location	Deer Valley Road, Antioch CA 94513
Name of Developer	Monte Albers and Lucia Albers Trust & Elizabeth Ann Iannaccone Living Trust
Project Phase No.	NA
Project Type and Description	301 single-family homes with neighborhood park and future development areas
Project Watershed	Sand Creek draining to Marsh Creek
Total Project Site Area (acres)	96.5 Acres
Total Area of Land Disturbed (acres)	57.8 Acres
Total New Impervious Surface Area (sq. ft.)	34.0 Acres
Total Replaced Impervious Surface Area	0.0 Acres
Total Pre-Project Impervious Surface Area	0.0 Acres
Total Post-Project Impervious Surface Area	34.0 Acres
50% Rule	Applies
Project Density (Gross)	301 DU/96.5 Acres = 3.1 DU/Acre
Applicable Special Project Categories	None
Percent LID and non-LID treatment	100% LID
HMP Compliance	Applies

II. SETTING

II.A. Project Location and Description

The 57.8-acre Albers Property Project ("Project") is located within a property containing roughly 96.5 acres in the City of Antioch, Contra Costa County. The property is located east of Deer Valley Road, West of Highway 4, as shown in Appendix A – Vicinity Map. The project is bordered by Deer Valley Road to the West, Contra Costa County Flood Control District (CCCFCD) to the North, Future Creekside Development (Subdivision 9501) to the East, and open space to the South. An aerial view of the surrounding area is shown as Appendix B – Site Aerial.

The project will include no more than 301 single family homes, private roadways, sidewalk, landscape, and nature trails on approximately 57.8 acres. Roughly 38.7 Acres surrounding the project will remain as open space.

II.B. Existing Site Features and Conditions

The existing site is located on a vacant parcel. The project is an undeveloped open space, consisting almost exclusively of undisturbed dirt with sparse grasses and trees along Sand Creek. Immediately to the north of the project is a CCCFCD basin, which is planned to be a future recreational area, and a vacant Antioch Unified School District parcel. To the south and east are parcels planned for future development and to the west is Deer Valley Road. The pre-project conditions can be found in Appendix C – Pre-Project Conditions.

The Albers Project is located between two knolls. Elevations on the site range from approximately 324 feet at the top of the western knoll, to 175 feet at the southeastern corner of the project. Sand Creek cuts through the project along the western edge, well away from the disturbed project area. About 1/3 of the project drains west towards Sand Creek, while the remaining area drains east towards a valley which eventually finds its way to the watercourse east of the planned Creekside Project. Annual rainfall onsite is approximately 14 inches, per the Contra Costa County Flood Control and Water Conservation District's Mean Seasonal Isohyets Map as shown in Appendix D.

II.C. Opportunities and Constraints for Stormwater Control

<u>Opportunities</u>

- *<u>Low Areas</u>* - The proposed project grading provides an opportunity to connect to the proposed Creekside Project with the low point being the southeastern corner of the project. This is the entry into the project and storm drain outfall point of connection.
- *<u>Significant Elevation Change</u>* – The elevation change across the site is nearly 150 feet which provides flexibility in storm drain layout and design.

Constraints

- *Significant Elevation Change* – The site has significant grading, and conform difficulties which forces all drainage to be handled in one location, rather than being dispersed throughout the site in landscaped areas or multiple bioretention basins.

III. LOW IMPACT DEVELOPMENT DESIGN STRATEGIES

III.A. Optimization of Site Layout

III.A.1. Limitation of Development Envelope

The proposed project will impact 60% of the 96.5-acre project site. The remaining site will remain as undisturbed open space. In addition, approximately 1-2 acres of the project site will be a park area with minimal impervious areas.

III.A.2. Preservation of Natural Drainage Features

No natural drainage features will be impacted as a part of this project.

III.A.3. Setbacks from Creeks, Wetlands and Riparian Habitats

As mentioned previously, Sand Creek (being the only natural drainage feature on or adjacent to the project) will remain undisturbed.

III.A.4. Minimization of Imperviousness

Imperviousness was limited by clustering development and limiting the overall development envelope.

III.A.5. Use of Drainage as a Design Element

The project was planned with water quality treatment goals at the forefront. Every effort was made to minimize impervious surfaces and direct runoff to less pervious surfaces. The detention basin is to be incorporated into the park design as a usable recreational amenity for the community to utilize as an open space area.

III.A.6. Use of Permeable Pavements

The project is not incorporating permeable pavers, due to the low infiltration capacity of on-site soils.

III.B. Dispersal of Runoff to Pervious Areas

The low infiltration capacity of on-site soils makes using pervious areas not viable as an opportunity for dispersal of runoff.

III.C. Feasibility Assessment of Harvesting and Use for Treatment and Flow-Control

III.C.1. Permeability of Site Soils

The Stormwater C.3 Guidebook set a minimum permeability threshold of 1.6 inch/hour. The project's soil permeability is below the given threshold, which limits the use of any IMPs that require infiltration as a basis for stormwater management.

III.C.2. Potential Opportunities for Harvesting and Use

Based on site density and the land plan, it is infeasible to store and distribute rainwater collection from the roofs for reuse.

III.C.3. Harvesting and Use Feasibility Calculations

Table 2. Harvesting and Use Feasibility

A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*
Impervious Area Description	*Square feet of Impervious Surface*	*Acres of Impervious Surface*	*Uses and User Units*	*Toilet and Urinal Water Usage (gal/day)*	*Water Use per Acre (gal/day/ acre)*	*Required demand (gal/day /acre).*	*Is Projected Use > Required Demand? (Column F > Column G?)*	*Can runoff be piped to an irrigated area 2.5x the impervious area (Column B)?*	*Is there any other consistent, reliable demand for the quantity in Column G?*
Residential Development	1,479,000± SF	34.0±	301 Units (2.8 User Units)	2,500	73.5	4,200	No	No	No

III.C.4. Integrated Management Practices

To meet the requirements of Stormwater Treatment laid out by the C.3 Requirements, the project will use a combination of detention and bioretention to meter and treat the on-site runoff. In order to treat the on-site runoff, the site has been divided into seven drainage management areas. The post project conditions can be found in Appendix E – Post-Project Conditions.

Bioretention treatment areas are designed to filter pollutants from stormwater runoff from adjacent roofs, streets and landscape areas using a combination of vegetation, ponding, permeable planting soil, and a subdrain system. Bioretention treatment areas, which will receive runoff through roof downspouts, local area drain systems, and storm drain systems, will be located at two different locations on the site, ultimately finding their way to natural watercourses in the area.

Bioretention treatment areas will be sized to maximize treatment for tributary areas. Runoff that is directed into the bioretention areas will infiltrate through a minimum of 18" of biotreatment soil (as identified in Attachment L of the Municipal Regional Permit). The treatment soil and the planting material to be used within the bioretention treatment areas must have in filtration rate of 5 inches per hour to meet the minimum infiltration criteria.

Each bioretention area is equipped with an overflow structure that will direct excess water directly into the drainage system. In all cases, the opening of the overflow pipe will be set to meet the minimum ponding depth requirements for each bioretention area. Sizing of IMP 1 is per the "cistern + bioretention" sizing criteria, and sizing of IMP 2 is per the "bioretention" sizing criteria.

IV. DOCUMENTATION OF DRAINAGE DESIGN

IV.A. Descriptions of each Drainage Management Area

Table 3. Table of Drainage Management Areas

DMA Name	***Surface Type***	***Area (square feet)***
DMA 1I	*Concrete or Asphalt*	*1,479,000*
DMA 1P	*Landscape*	*632,200*
DMA 2	*Concrete or Asphalt*	*23,900*
DMA 3	*Landscape*	*736,100*
DMA 4	*Landscape*	*87,100*
DMA 5	*Landscape*	*309,200*
DMA 6	*Landscape*	*200,300*
DMA 7	*Landscape*	*731,800*

DMA 1I, totaling 1,479,000 square feet, drains the impervious surfaces located in DMA 1. DMA 1I drains to the detention basin component of IMP 1, which is located in the southeast corner of the project.

DMA 1P, totaling 632,200 square feet, drains the pervious surfaces located in DMA 1. DMA 1P drains to the detention basin component of IMP 1, which is located in the southeast corner of the project.

DMA 2, totaling 23,900 square feet, drains the impervious emergency vehicle access road located in DMA 2. DMA 2 drains to IMP 2, a bioretention basin located in the southwest corner of the project, east of Sand Creek.

DMA 3, totaling 736,100 square feet, drains undisturbed open space. DMA 3 drains to Sand Creek and is undisturbed by the development.

DMA 4, totaling 87,100 square feet, drains undisturbed open space. DMA 4 drains to the CCCFCD flood control basin and is undisturbed by the development.

DMA 5, totaling 309,200 square feet, drains undisturbed open space. DMA 5 drains to a clean water storm drain system and is conveyed offsite to the natural watercourse east of the Creekside Project.

DMA 6, totaling 200,300 square feet, drains undisturbed open space. DMA 6 drains to a clean water storm drain system and is conveyed offsite to the natural watercourse east of the Creekside Project.

DMA 7, totaling 731,800 square feet, drains undisturbed open space. DMA 7 drains to a clean water storm drain system and is conveyed offsite to the natural watercourse east of the Creekside Project.

IV.B. Tabulation and Sizing Calculations

IV.B.1. Information Summary for IMP Design

Total Project Area (Square Feet)	4,203,500
Mean Annual Precipitation	14 inches
IMPs Designed For:	Treatment + Flow Control

IV.B.2. Self-Treating Areas

Table 4. Self-Treating Areas

DMA Name	*Area (square feet)*
DMA 3	*736,100*
DMA 4	*87,100*
DMA 5	*309,200*
DMA 6	*200,300*
DMA 7	*731,800*

IV.B.3. Self-Retaining Areas

This project does not use self-retaining areas as part of the stormwater management strategy.

IV.B.4. Areas Draining to Self-Retaining Areas

This project does not use self-retaining areas as part of the stormwater management strategy.

IV.B.5. Areas Draining to IMPs

IMP Name: IMP1 (Soil Type: C)

IMP Type: Cistern + Bioretention Facility
Soil Type C

IMP Sizing				
DMA 1I	1,479,000	Concrete or Asphalt	1.00	1,479,000
DMA 1P	632,200	Landscape	0.50	316,100
			Total	1,795,100

	IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
Area	0.013	0.594	13,860	13,900
Volume	0.105	1.227	231,335	235,000

Maximum Underdrain Flow (cfs)	1.78
Orifice Diameter (in)	5.23

IMP Name: IMP2 (Soil Type: C)

IMP Type: Bioretention Facility
Soil Type: C

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor
DMA 2	23,900	Concrete or Asphalt	1.00	23,900
			Total	23,900

IMP Sizing				
	IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
Area	0.060	1.227	1,760	1,800
Surface Volume	0.050	1.227	1,467	1,500
Subsurface Volume	0.066	1.227	1,936	2,000

Maximum Underdrain Flow (cfs)	0.02
Orifice Diameter (in)	0.92

IV.B.6. Areas Draining to Non-LID Treatment

This project does not use Non-LID Treatment measures as part of the stormwater management strategy.

V. SOURCE CONTROL MEASURES

V.A.1. Site activities and Potential Sources of Pollutants

Control of pollutant sources limits the release of pollutants into the stormwater system and serves an important early role in reducing urban pollutants. This single-family residential project has the following potential sources of stormwater pollutants:

- Dumping into storm drain inlets
- Need for future indoor & structural pest control
- Landscape/Outdoor pesticide use
- Vehicle and Equipment Cleaning and Repair
- Plazas, sidewalks and parking lots

V.A.2. Source Control Table

Potential source of runoff pollutants	***Permanent source control BMPs***	***Operational source control BMPs***
On-site Storm Drain Inlets	Mark all inlets with the words "No Dumping! Flows to Bay"	Inlet markings will be inspected annually and replaced or renewed as needed.
Need for future indoor & structural pest control	Building design features will discourage entry of pests	Integrated Pest Management information to be provided to owners, lessees and operators.
Landscape/Outdoor pesticide use	Native trees, shrubs, and ground cover will be preserved to the maximum extent possible. Landscaping will be designed to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where possible, pest-resistant plants will be used adjacent to hardscape. Plants will be selected appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, use of recycled water, and plant interactions.	All site landscaping is to be maintained by a professional landscaping contractor. Contract to state that landscaping is to be maintained using Integrated Pest Management (IPM) principles, with minimal or no use of pesticides.
Vehicle and Equipment Cleaning and Repair	Discourage on-site car washing and vehicle repair.	No persons shall dispose of, nor permit the disposal of vehicle fluids, hazardous materials or rinse water from parts cleaning into storm drains.
Plazas, sidewalks, and parking lots		Sweep plazas, sidewalks and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect wash water containing any cleaning agent or degreaser and discharge to the sanitary sewer not to the storm drain.

VI. STORMWATER FACILITY MAINTENANCE

VI.A.1. Ownership and Responsibility for Maintenance in Perpetuity

The stormwater management facilities identified in this stormwater control plan will be owned and maintained by the future homeowner's association. The property owner will be subject to an annual fee (set by the City's standard fee schedule) to offset the cost of inspecting the site or verifying that the stormwater management facilities are being maintained. A comprehensive Operations and Maintenance plan will be provided with approval of the project improvement plans.

VI.A.2. Certifications

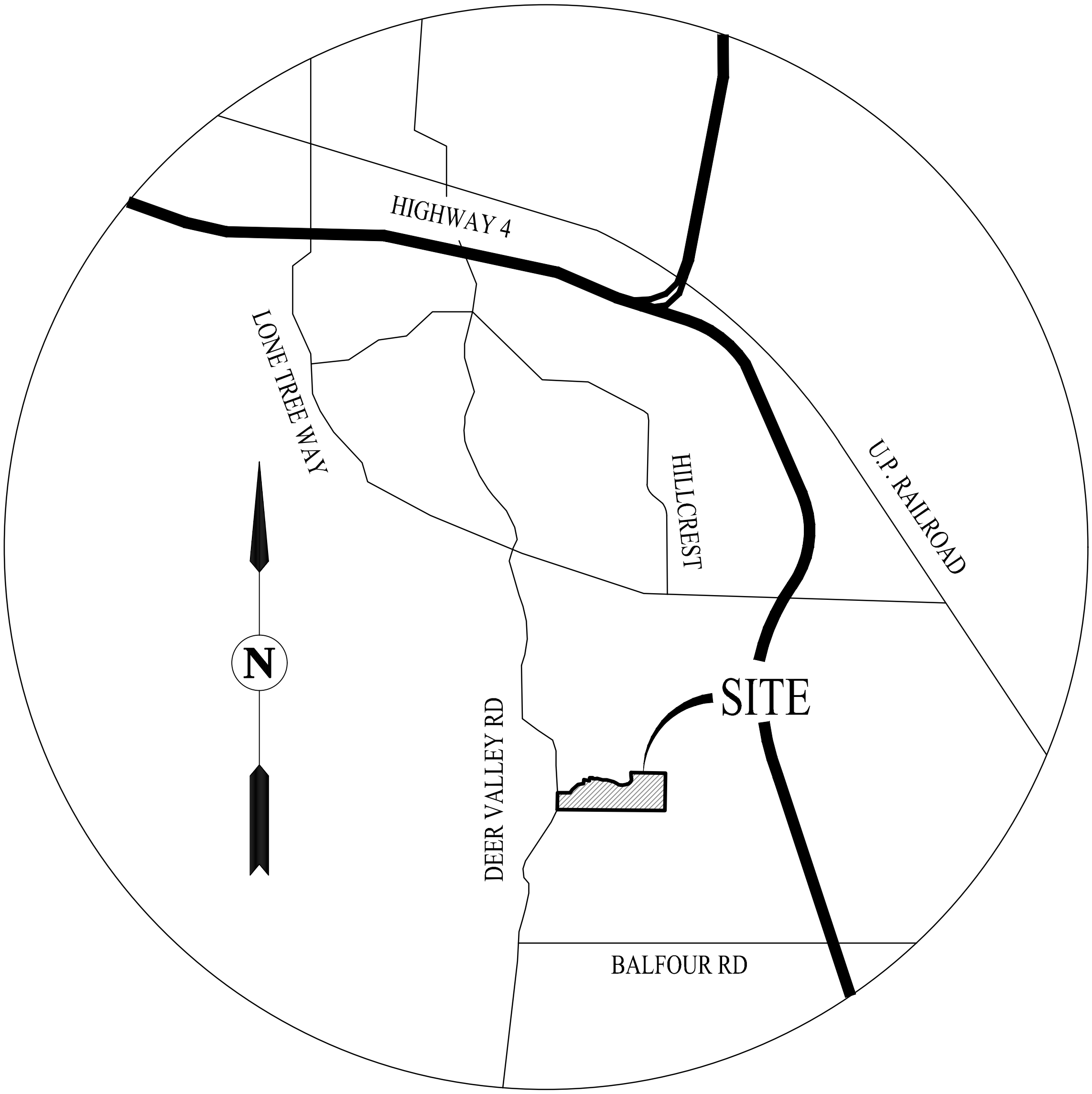
The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order R2-2009-0074 and Order R2-2011-0083.

______________________________________ ____________________

Jason D. Vogan, P.E. Date

RCE #59299

Appendices



APPENDIX A

VICINITY MAP

ALBERS PROPERTY

CITY OF ANTIOCH CONTRA COSTA COUNTY CALIFORNIA

DATE: MAY 22, 2019 SCALE: NTS

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APPENDIX B

SITE AERIAL

ALBERS PROPERTY

CITY OF ANTIOCH   CONTRA COSTA COUNTY   CALIFORNIA

0'   150'   450'   600'

SCALE: 1" = 150'   DATE: MAY 22, 2019

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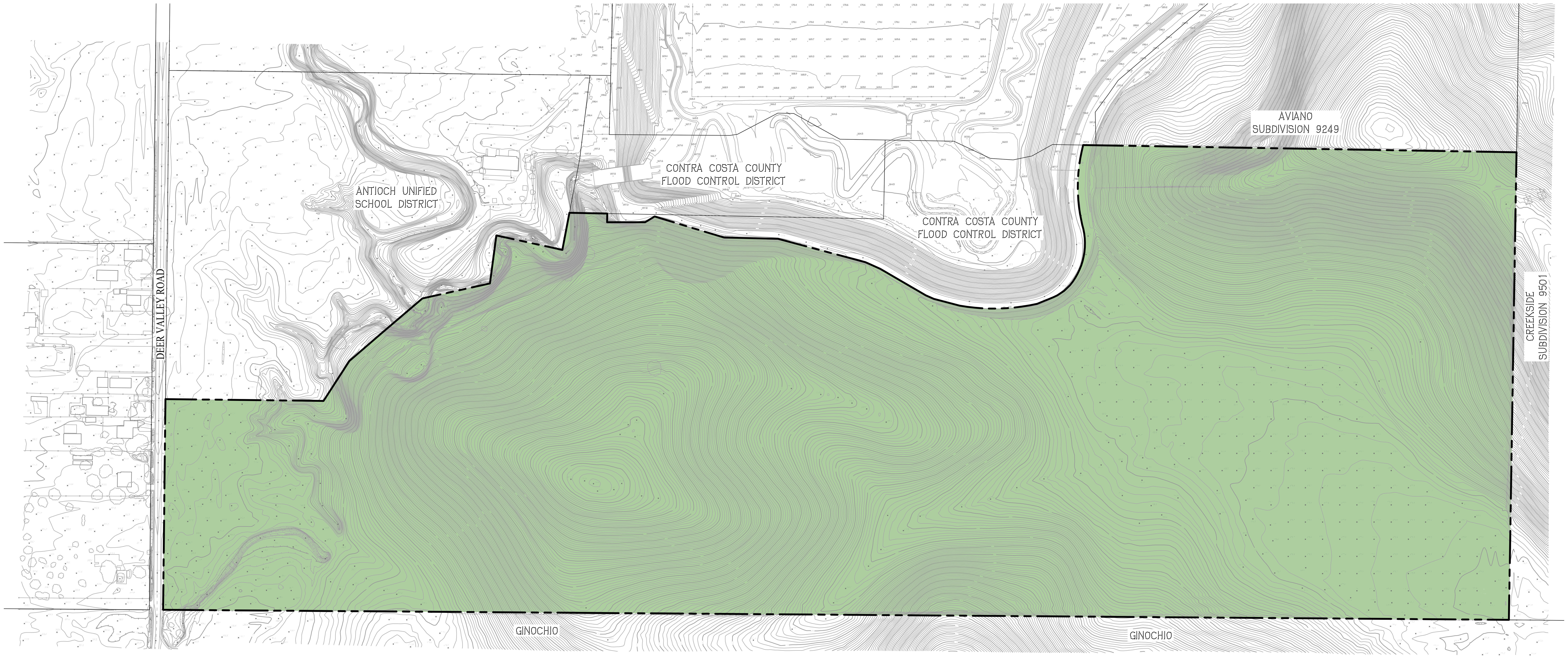

LEGEND

PROJECT BOUNDARY

PERVIOUS AREA – 96.5 AC (100% TOTAL AREA)

APPENDIX C
PRE-PROJECT CONDITIONS
ALBERS PROPERTY

CITY OF ANTIOCH CONTRA COSTA COUNTY CALIFORNIA

0' 150' 450' 600'

SCALE: 1" = 150'

DATE: MAY 22, 2019

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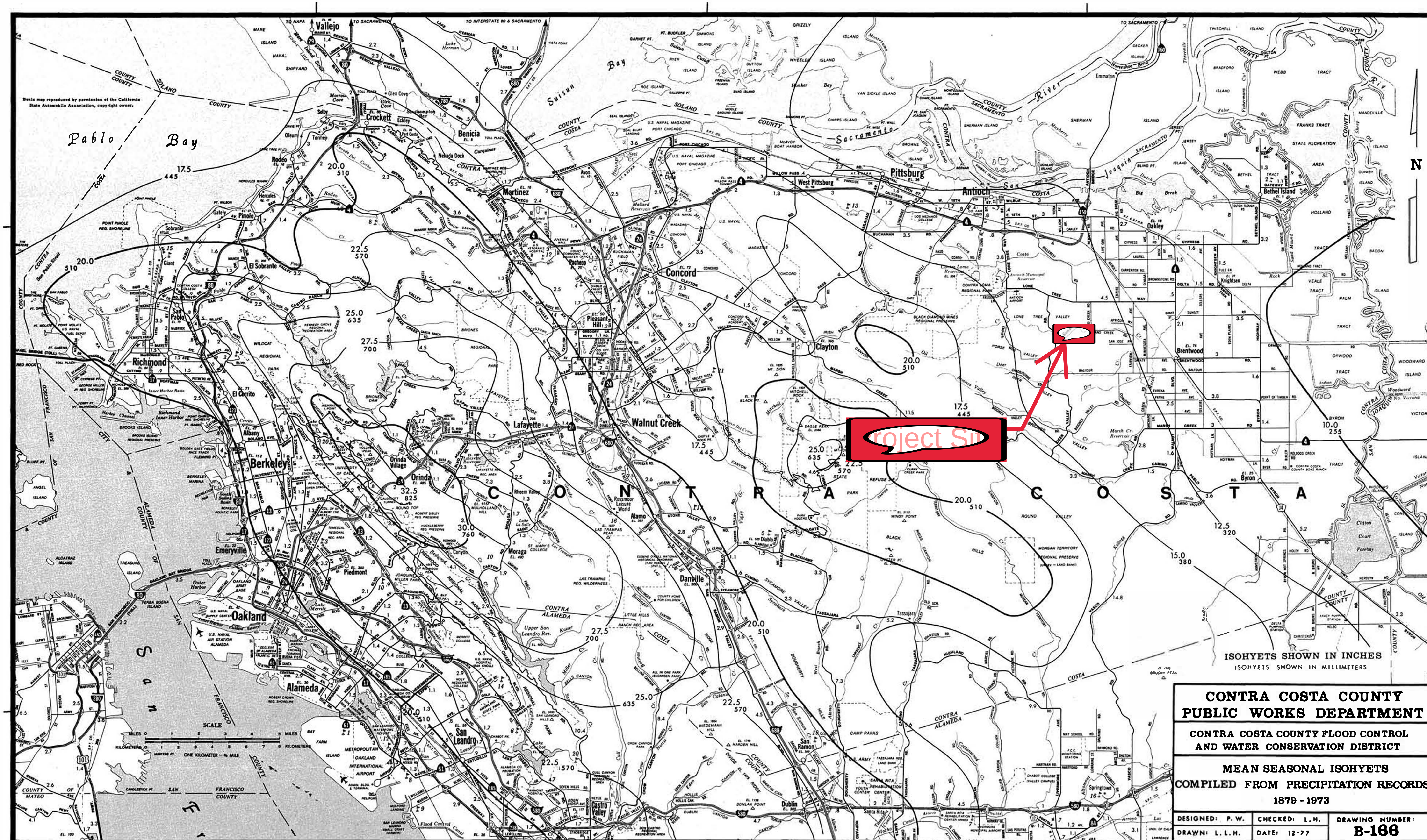
PENDIX



ISOHYETS SHOWN IN INCHES
ISOHYETS SHOWN IN MILLIMETERS
CONTRA COSTA COUNTY
PUBLIC WORKS DEPARTMENT
CONTRA COSTA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
MEAN SEASONAL ISOHYETS
COMPILED FROM PRECIPITATION RECORDS
1879 - 1973
DESIGNED: P. W.
CHECKED: L. H.
DRAWING NUMBER: B-166
DRAWN: L. L. H.
DATE: 12-77
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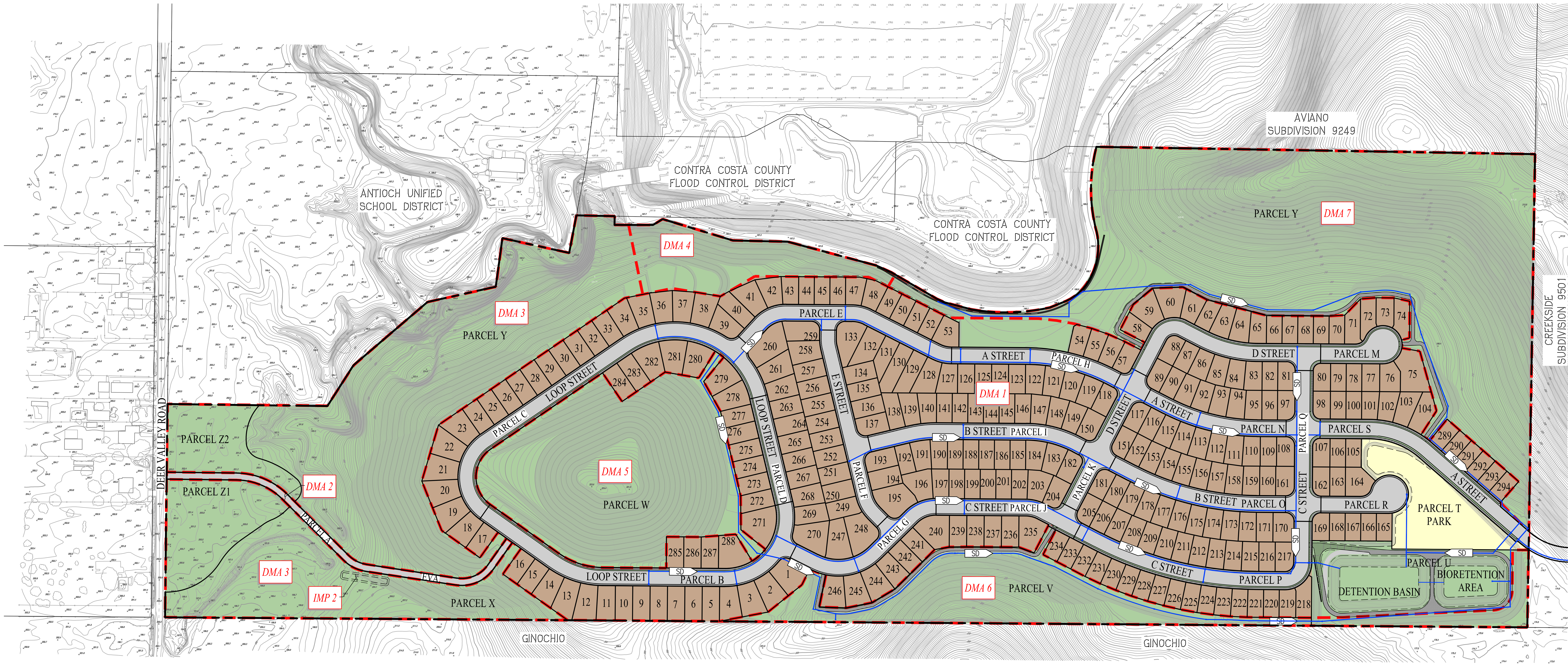

LEGEND

PROPOSED	DESCRIPTION
	SUBDIVISION BOUNDARY
	LOT LINE
	RIGHT OF WAY
	CURB & SIDEWALK
	BIORETENTION AREA
SD	STORM DRAIN
	DMA BOUNDARY
	FIELD INLET
	MANHOLE
	IMPERVIOUS AREA
	PERVIOUS AREA
	LOTS
	OPTIONAL PARK/FUTURE DEVELOPMENT AREA
DMA 1	DRAINAGE MANAGEMENT AREA

PERVIOUS/IMPERVIOUS AREAS										
AREA ID	PER (SF)	PER (%)	IMP (SF)	IMP (%)	TOTAL (SF)	DETENTION REQUIRED (CY)	DETENTION PROVIDED (CY)	BIORETENTION REQUIRED (SF)	BIORETENTION PROVIDED (SF)	PONDING (IN)
DMA 1	712,500	33.7%	1,398,700	66.3%	2,111,200	231,335	235,000	13,860	13,900	12
DMA 2	0	0.0%	23,900	100.0%	23,900	---	---	1,760	1,800	12
TOTAL	**712,500**	33.4%	**1,422,600**	66.6%	**2,135,100**	**231,335**	**235,000**	**15,620**	**15,700**	---

SELF TREATING DMA SUMMARY	
AREA ID	AREA (AC)
DMA 3	16.9
DMA 4	2.0
DMA 5	7.1
DMA 6	4.6
DMA 7	16.8
TOTAL	47.4

APPENDIX E
POST-PROJECT CONDITIONS
ALBERS PROPERTY

CITY OF ANTIOCH   CONTRA COSTA COUNTY   CALIFORNIA

0'   150'   450'   600'

SCALE: 1" = 150'

DATE: APRIL 26, 2021

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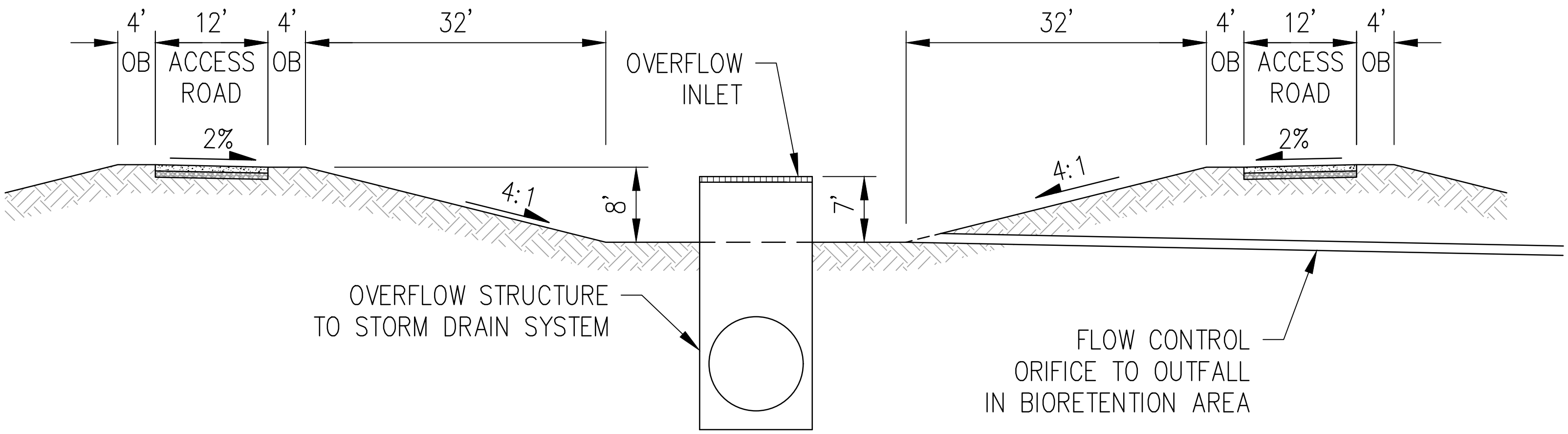

APPENDIX F

DETENTION BASIN DETAIL

ALBERS PROPERTY

CITY OF ANTIOCH CONTRA COSTA COUNTY CALIFORNIA

DATE: MAY 22, 2019 SCALE: NTS

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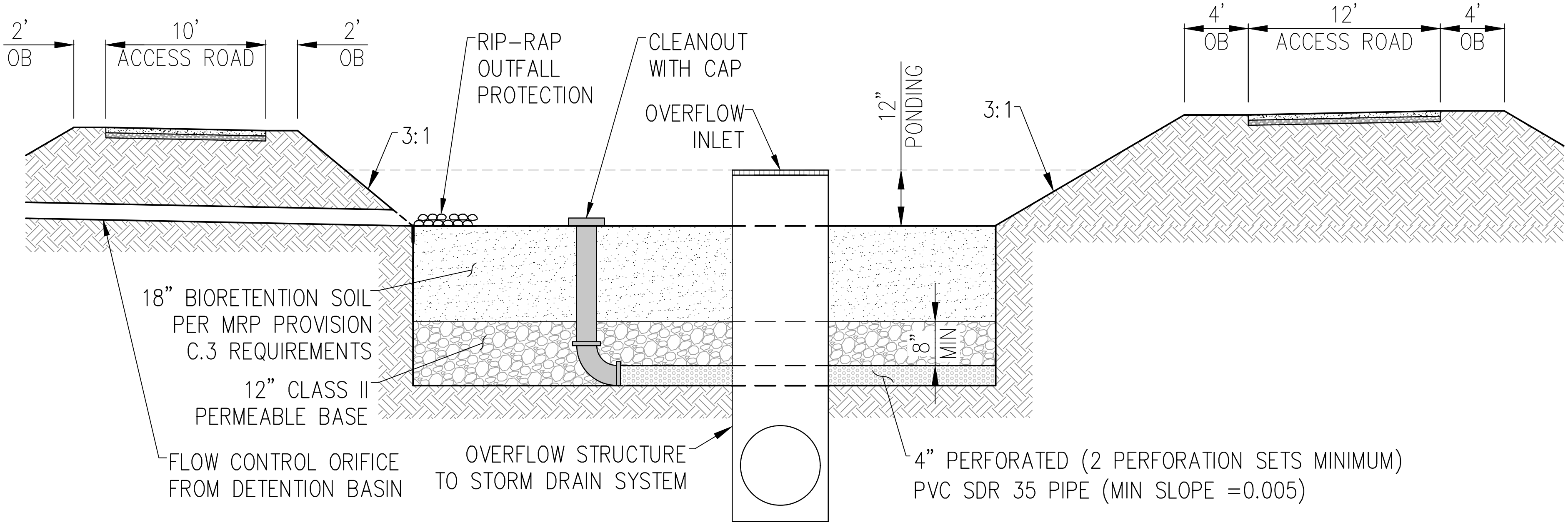

APPENDIX G

BIORETENTION AREA DETAIL

ALBERS PROPERTY

CITY OF ANTIOCH CONTRA COSTA COUNTY CALIFORNIA

DATE: MAY 22, 2019 SCALE: NTS

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APPENDIX E

ENVIRONMENTAL NOISE ASSESSMENT

Environmental Noise Assessment

Albers Ranch Project

City of Antioch, California

June 22, 2021

Project #210503

Prepared for:

Raney Planning and Management
1501 Sports Drive, Suite A
Sacramento, CA 95834

Prepared by:

Saxelby Acoustics LLC

Luke Saxelby, INCE Bd. Cert.
Principal Consultant
Board Certified, Institute of Noise Control Engineering (INCE)

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Roseville, CA 95678

Table of Contents

Appendices

List of Figures

List of Tables

INTRODUCTION

The Albers Ranch project consists of the development of up to 300 single-family home subdivision on a 96.5-acre lot. The project could also include an approximately 150-bed assisted living facility or commercial use. The proposed homes will be located approximately 730 feet from the centerline of Deer Valley Road. The project is located east of Deer Valley Road, South of Prewett Ranch Road, and West of Hillcrest Avenue in the City of Antioch, California.

Figure 1 shows the project site plan. **Figure 2** shows an aerial photo of the project site.

ENVIRONMENTAL SETTING

BACKGROUND INFORMATION ON NOISE

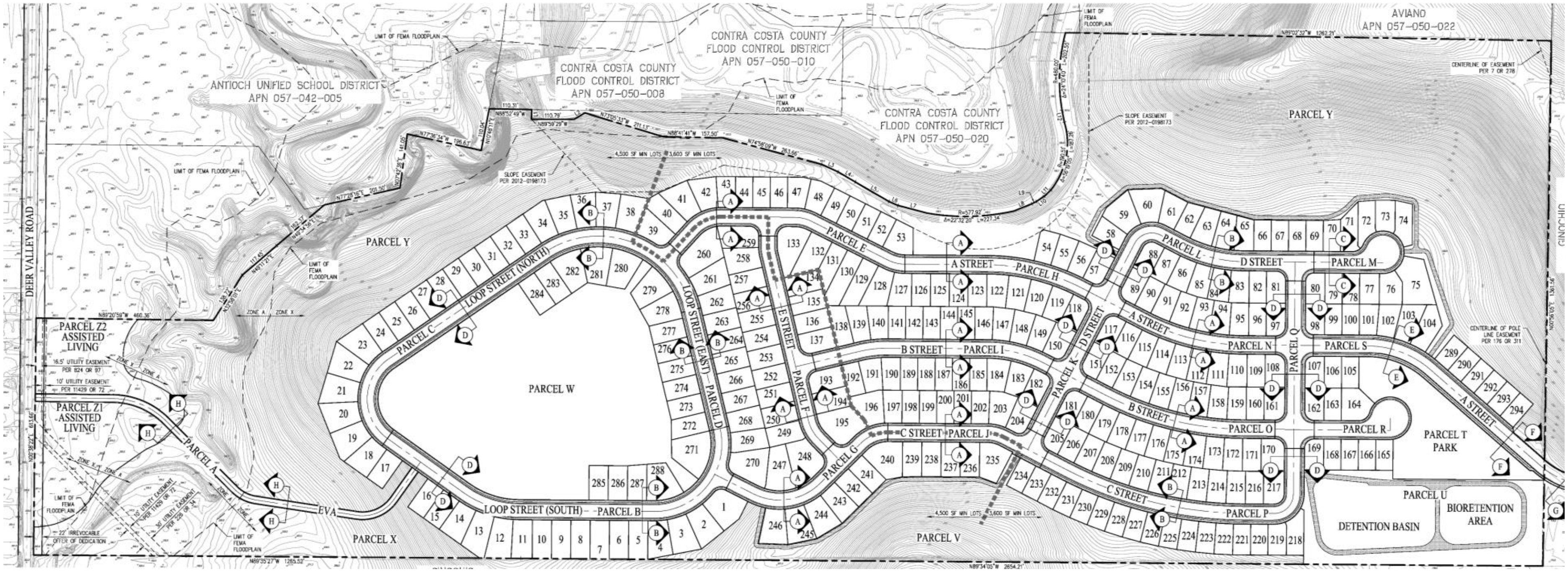
Fundamentals of Acoustics

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.



Albers Ranch Project

City of Antioch, California

Figure 1
Project Site Plan

SAXELBY
ACOUSTICS
Acoustics · Noise · Vibration

Albers Ranch Project

City of Antioch, California

Figure 2

Noise Measurement Sites

Legend

Project Site

Noise Measurement - Long Term

50 m 150 m 250 m 350 m

Projection: UTM Zone 10 / WGS84 / meters
Rev. Date: 06/15/2021

SAXELBY ACOUSTICS
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The decibel scale is logarithmic, not linear. In other words, two sound levels 10-dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10-dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (DNL or L_{dn}) is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 1 lists several examples of the noise levels associated with common situations. **Appendix A** provides a summary of acoustical terms used in this report.

TABLE 1: TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft.)	--100--	
Gas Lawn Mower at 1 m (3 ft.)	--90--	
Diesel Truck at 15 m (50 ft.), at 80 km/hr. (50 mph)	--80--	Food Blender at 1 m (3 ft.) Garbage Disposal at 1 m (3 ft.)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft.)	--70--	Vacuum Cleaner at 3 m (10 ft.)
Commercial Area Heavy Traffic at 90 m (300 ft.)	--60--	Normal Speech at 1 m (3 ft.)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. September, 2013.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1-dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6-dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING AND FUTURE NOISE AND VIBRATION ENVIRONMENTS

EXISTING NOISE RECEPTORS

Some land uses are considered more sensitive to noise than others. Land uses often associated with sensitive receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Sensitive noise receptors may also include threatened or endangered noise sensitive biological species, although many jurisdictions have not adopted noise standards for wildlife areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise.

Sensitivity is a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. In the vicinity of the project site, sensitive land uses include existing single-family residential uses located west and north of the project site.

EXISTING GENERAL AMBIENT NOISE LEVELS

The existing noise environment in the project area is primarily defined by traffic noise emanating from Deer Valley Road to the west of the project site.

To quantify the existing ambient noise environment in the project vicinity, a continuous (24-hr.) noise level measurement was conducted at one location on the project site. The noise measurement location is shown on **Figure 2**. A summary of the noise level measurement survey results is provided in **Table 2**. **Appendix B** contains the complete results of the noise monitoring.

The sound level meter was programmed to record the maximum, median, and average noise levels at the project site during the survey. The maximum value, denoted L_{max}, represents the highest noise level measured. The average value, denoted L_{eq}, represents the energy average of all of the noise received by the sound level meter microphone during the monitoring period. The median value, denoted L_{50}, represents the sound level exceeded 50 percent of the time during the monitoring period.

A Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter was used for the ambient noise level measurement survey. The meter was calibrated before and after use with a B&K Model 4230 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

TABLE 2: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA

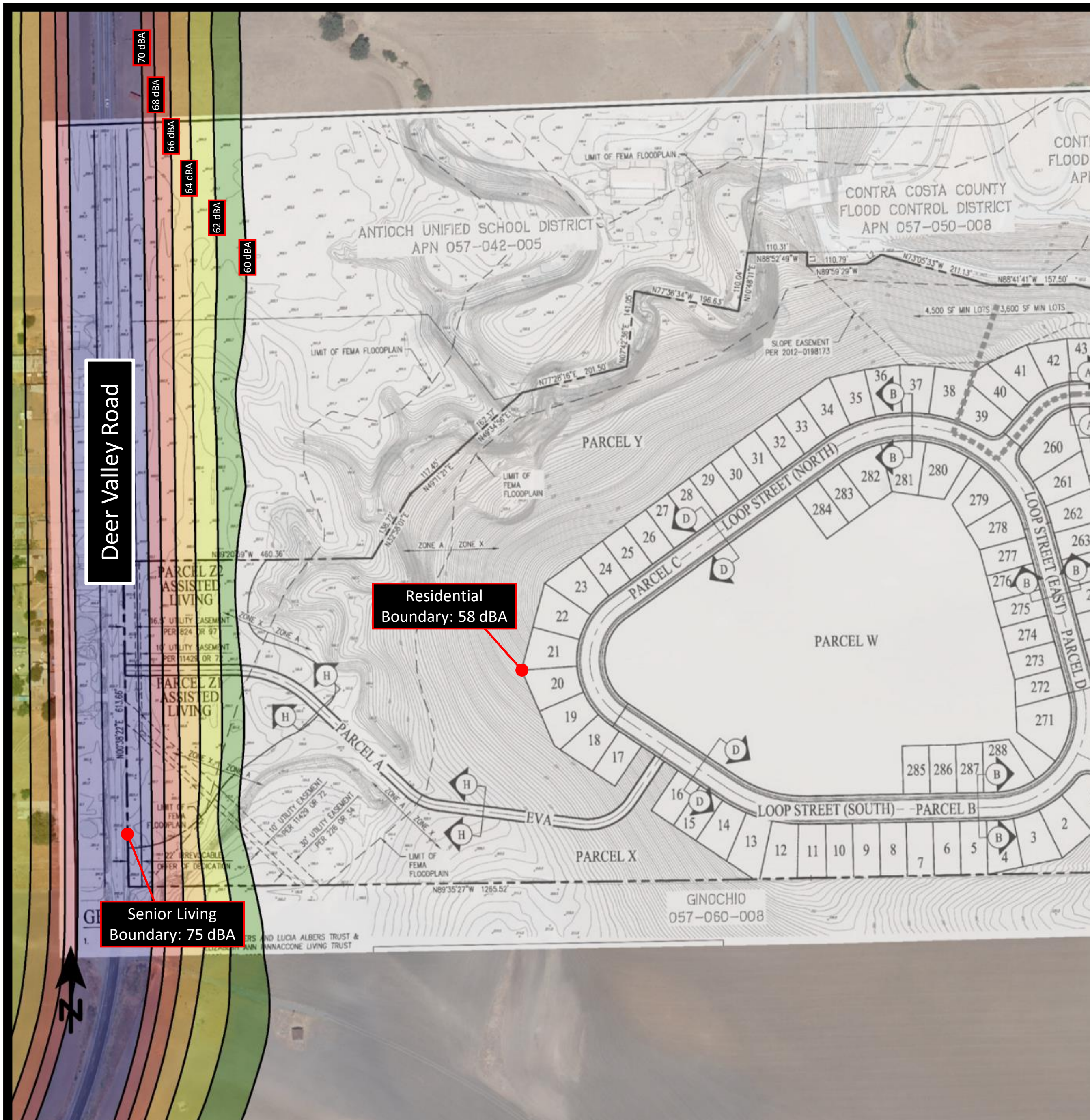
		Average Measured Hourly Noise Levels, dBA						
			Daytime (7:00 am - 10:00 pm)			Nighttime (10:00 pm – 7:00 am)		
Site	Date	CNEL/L_{dn}	L_{eq}	L_{50}	L_{max}	L_{eq}	L_{50}	L_{max}
LT-1	9/17/2019 - 9/18/2019	55	50	47	60	49	45	60
Source: j.c. brennan & associates – 2019								

Albers Ranch Project

City of Antioch, California

Figure 3

Project Noise Contours (dBA CNEL)



Signs and symbols

Levels in dB(A)

	<= 60
	60 - 62
	62 - 64
	64 - 66
	66 - 68
	68 - 70
	> 70

1 : 3250

0 15 30 60 90 120 m

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FUTURE TRAFFIC NOISE ENVIRONMENT AT OFF-SITE RECEPTORS

OFF-SITE TRAFFIC NOISE IMPACT ASSESSMENT METHODOLOGY

To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels are predicted at sensitive receptors for existing and existing plus project conditions.

Existing noise levels due to traffic are calculated using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108). The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions. To predict traffic noise levels in terms of L_{dn}, it is necessary to adjust the input volume to account for the day/night distribution of traffic.

Project trip generation volumes were provided by the project traffic engineer (Fehr & Peers, 2021), truck usage and vehicle speeds on the local area roadways were estimated from field observations. The predicted increases in traffic noise levels on the local roadway network for Existing, Near-Term, and Cumulative conditions which would result from the project are provided in terms of L_{dn}.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. In some locations sensitive receptors may not receive full shielding from noise barriers, or may be located at distances which vary from the assumed calculation distance.

Tables 3-5 summarize the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the Project area. **Appendix C** provides the complete inputs and results of the FHWA traffic modeling.

TABLE 3: PREDICTED TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Existing + Creekside + Promenade	Existing + Project	Change
Deer Valley Road	Lone Tree Wy to Prewett Ranch Dr	62.4	62.6	0.2
Deer Valley Road	South of Prewett Ranch Dr	71.0	71.4	0.4
Lone Tree Way	Deer Valley Rd to Hillcrest Ave	64.0	64.2	0.2
Lone Tree Way	East of Hillcrest Ave	65.2	65.5	0.3
Prewett Ranch Rd	Deer Valley Rd to Hillcrest Ave	58.4	58.8	0.4
Hillcrest Ave	North of Lone Tree Way	60.6	61.3	0.8
Hillcrest Ave	Lone Tree Wy to Prewett Ranch Dr	61.9	62.6	0.7
Hillcrest Ave	South of Prewett Ranch Dr	57.5	59.8	2.3

TABLE 4: NEAR-TERM TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Near-Term No Project	Near-Term + Project	Change
Deer Valley Road	Lone Tree Wy to Prewett Ranch Dr	64.2	64.3	0.1
Deer Valley Road	South of Prewett Ranch Dr	73.1	73.4	0.3
Lone Tree Way	Deer Valley Rd to Hillcrest Ave	65.5	65.6	0.1
Lone Tree Way	East of Hillcrest Ave	65.9	66.1	0.2
Prewett Ranch Rd	Deer Valley Rd to Hillcrest Ave	59.9	60.2	0.3
Hillcrest Ave	North of Lone Tree Way	61.6	62.1	0.5
Hillcrest Ave	Lone Tree Wy to Prewett Ranch Dr	62.2	62.7	0.5
Hillcrest Ave	South of Prewett Ranch Dr	61.0	61.9	0.9

TABLE 5: CUMULATIVE TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Cumulative No Project	Cumulative + Project	Change
Deer Valley Road	Lone Tree Wy to Prewett Ranch Dr	64.8	64.9	0.1
Deer Valley Road	South of Prewett Ranch Dr	72.9	73.2	0.3
Lone Tree Way	Deer Valley Rd to Hillcrest Ave	66.0	66.1	0.1
Lone Tree Way	East of Hillcrest Ave	66.8	67.0	0.1
Prewett Ranch Rd	Deer Valley Rd to Hillcrest Ave	60.3	60.4	0.1
Hillcrest Ave	North of Lone Tree Way	65.2	65.4	0.2
Hillcrest Ave	Lone Tree Wy to Prewett Ranch Dr	63.9	64.2	0.4
Hillcrest Ave	South of Prewett Ranch Dr	63.1	63.7	0.6

Based upon the data in **Tables 3-5**, the proposed project is predicted to result in an increase in a maximum traffic noise level increase of 2.3 dBA.

CONSTRUCTION NOISE ENVIRONMENT

During the construction of the proposed project, including roads, water and sewer lines, and related infrastructure, noise from construction activities would temporarily add to the noise environment in the project vicinity. As shown in **Table 6**, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet.

TABLE 6: CONSTRUCTION EQUIPMENT NOISE

Type of Equipment	Maximum Level, dBA at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: *Roadway Construction Noise Model User's Guide*. Federal Highway Administration. FHWA-HEP-05-054. January 2006.

CONSTRUCTION VIBRATION ENVIRONMENT

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and parking lot construction occur. **Table 7** shows the typical vibration levels produced by construction equipment.

TABLE 7: VIBRATION LEVELS FOR VARIOUS CONSTRUCTION EQUIPMENT

Type of Equipment	Peak Particle Velocity at 25 feet (inches/second)	Peak Particle Velocity at 50 feet (inches/second)	Peak Particle Velocity at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (Less than 0.20 at 26 feet)	0.074	0.026

Source: *Transit Noise and Vibration Impact Assessment Guidelines.* Federal Transit Administration. May 2006.

REGULATORY CONTEXT

FEDERAL

There are no federal regulations related to noise that apply to the Proposed Project.

STATE

The State Building Code, Title 24, Part 2 of the State of California Code of Regulations, establishes uniform minimum noise insulation performance standards to protect persons within new buildings which house people, including hotels, motels, dormitories, apartment houses, and dwellings other than single-family dwellings. Title 24 mandates that interior noise levels attributable to exterior sources shall not exceed 45 dB L_{dn} or CNEL in any habitable room. Title 24 also mandates that for structures containing noise-sensitive uses to be located where the L_{dn} or CNEL exceeds 60 dB, an acoustical analysis must be prepared to identify mechanisms for limiting exterior noise to the prescribed allowable interior levels. If the interior allowable noise levels are met by requiring that windows be kept closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment.

LOCAL

City of Antioch General Plan

The Antioch General Plan Noise Element Section 11.6.1 establishes standards for daytime and nighttime noise levels. The standards are reproduced in below:

11.6.1 Noise Objective: Achieve and maintain exterior noise levels appropriate to planned land uses through Antioch, as described below:

- Residential Single Family: 60 dBA CNEL within rear yards;
- Residential Multi-Family: 60 dBA CNEL within interior open space;
- Commercial/Industrial: 70 dBA at front setback;

The Antioch General Plan Noise Element Section 11.6.1 establishes standards for maximum allowable noise exposure from transportation noise sources. The maximum allowable exterior noise level is 60 dBA CNEL, applied at outdoor activity areas of single-family residential uses.

Criteria for Acceptable Vibration

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. **Table 8**, which was developed by Caltrans, shows the vibration levels which would normally be required to result in damage to structures. The vibration levels are presented in terms of peak particle velocity in inches per second.

Table 8 indicates that the threshold for architectural damage to structures is 0.20 in/sec p.p.v. A threshold of 0.2 in/sec p.p.v. is considered to be a reasonable threshold for short-term construction projects.

TABLE 8: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS

Peak Particle Velocity		Human Reaction	Effect on Buildings
mm/second	in/second		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: *Transportation Related Earthborne Vibrations.* Caltrans. TAV-02-01-R9601. February 20, 2002.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in significant noise impacts if noise levels conflict with adopted environmental standards or plans or if noise generated by the project would substantially increase existing noise levels at sensitive receivers on a permanent or temporary basis. Significance criteria for noise impacts are drawn from CEQA Guidelines Appendix G (Items XI [a-c]).

Would the project:

a. Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b. Generate excessive groundborne vibration or groundborne noise levels?

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Noise Level Increase Criteria for Long-Term Project-Related Noise Level Increases

The California Environmental Quality Act (CEQA) guidelines define a significant impact of a project if it "increases substantially the ambient noise levels for adjoining areas." Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local project criteria or ordinances, or substantially increase noise levels at noise sensitive land uses. The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is barely perceptible,
- A 5-dB change is clearly perceptible, and
- A 10-dB change is perceived as being twice or half as loud.

A limitation of using a single noise level increase value to evaluate noise impacts is that it fails to account for pre-project-noise conditions. **Table 9** is based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the L_{dn}/CNEL.

TABLE 9: SIGNIFICANCE OF CHANGES IN NOISE EXPOSURE

Ambient Noise Level Without Project, L_{dn}/CNEL	Increase Required for Significant Impact
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

Source: Federal Interagency Committee on Noise (FICON)

Based on the **Table 9** data, an increase in the traffic noise level of 5 dB or more would be significant where the pre-project noise levels are less than 60 dB L_{dn}/CNEL, or 3 dB or more where existing noise levels are between 60 to 65 dB L_{dn}/CNEL. Extending this concept to higher noise levels, an increase in the traffic noise level of 1.5 dB or more may be significant where the pre-project traffic noise level exceeds 65 dB L_{dn}/CNEL. The rationale for the **Table 9** criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT 1: WOULD THE PROJECT GENERATE A SUBSTANTIAL TEMPORARY OR PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE VICINITY OF THE PROJECT IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE, OR APPLICABLE STANDARDS OF OTHER AGENCIES?

Traffic Noise Increases

Based upon the **Table 9** criteria, where existing traffic noise levels are greater than 65 dB CNEL, at the outdoor activity areas of noise-sensitive uses, a +1.5 dB CNEL increase in roadway noise levels will be considered significant. As shown in **Table 3**, the maximum increase in traffic noise at the nearest sensitive receptor is predicted to be 2.3 dBA under the proposed project. At this location, the existing transportation noise level is less than 60 dB CNEL. In noise environments where the ambient noise level is less than 60 dB CNEL, a +5.0 dB increase is considered significant. Therefore, impacts resulting from increased traffic noise would be considered ***less-than-significant*** since the predicted increase is less than 5.0 dB.

Operational Noise at Existing Sensitive Receptors

The proposed project would include typical residential noise which would be compatible with the adjacent existing residential uses. Therefore, impacts resulting from project operational noise would be considered ***less-than-significant***.

Construction Noise

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. As indicated in **Table 6**, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dBA L_{max} at a distance of 50 feet. Construction activities would also be temporary in nature and are anticipated to occur during normal daytime working hours.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from the construction site. This noise increase would be of short duration and would occur during daytime hours.

Construction activities are limited by the General Plan Noise Element the Noise Ordinance during certain hours. The General Plan limits noise-producing construction related activities to between the hours of 7:00 a.m. and 7:00 p.m. Monday through Saturday, with no construction allowed on Sundays and public holidays. Sections 5-17.04 and 5-17.05 of the City of Antioch Municipal code restrict construction activities to between the hours of 8:00 a.m. and 5:00 p.m. on Monday through Friday when located within 300 feet of residential uses, and to the hours of 9:00 a.m. and 5:00 p.m. on Saturdays.

Although construction activities are temporary in nature and would occur during normal daytime working hours, construction-related noise could result in sleep interference at existing noise-sensitive land uses in the vicinity of the construction if construction activities were to occur outside the normal daytime hours. Therefore, impacts resulting from noise levels temporarily exceeding the threshold of significance due to construction would be considered ***potentially significant***.

Exterior noise at New Sensitive Receptors (Non-CEQA Issue)

Exterior Transportation Noise

As shown on **Figure 3**, the western boundary of the proposed single-family residential uses is predicted to be exposed to exterior noise levels of 58 dBA CNEL or less. This would comply with the 60 dB limit for outdoor activity areas of new residential uses. Therefore, no additional noise control measures would be necessary to meet the City of Antioch's exterior transportation noise criteria.

The western boundary of the proposed commercial/senior living facilities is predicted be exposed to noise levels of 75 dBA CNEL. To comply with the City of Antioch exterior transportation noise criteria, commercial uses would be required to be setback to the 70 dBA contour, which is located 70 feet from the centerline of Deer Valley Road.

Interior Transportation Noise

Based upon **Figure 3**, the proposed project would be exposed to exterior noise levels of less than 60 dBA CNEL at the proposed building facades. Modern building construction methods typically yield an exterior-to-interior noise level reduction of 25 dBA. Therefore, where exterior noise levels are 70 dBA CNEL, or less, no additional interior noise control measures are typically required. For this project, exterior noise levels are predicted to be up to 60 dBA CNEL, resulting in an interior noise level of 35 dBA CNEL based on typical building construction. This would comply with the State's 45 dBA L_{dn}/CNEL interior noise level standard. Therefore, no additional noise control measures would be required for the single-family residential uses.

The western boundary of the commercial/senior living facility land uses is exposed to exterior noise levels of up to 75 dBA CNEL. Therefore, project facades may be exposed to noise levels exceeding 70 dBA CNEL resulting in interior noise levels above 45 dBA CNEL. To determine if additional noise control beyond typical building construction is required, an acoustical study must be performed once building plans become available.

<u>Mitigation Measure</u>

MM-1 The City shall establish the following requirement:

- Construction activities shall be limited to the hours of 8:00 a.m. and 5:00 p.m. Monday through Friday when work is within 300 feet of occupied dwellings, and to between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday when work occurs greater than 300 feet from occupied dwellings. Such activities should be limited to the hours of 9:00 a.m. and 5:00 p.m. on Saturdays. No construction shall be allowed on Sundays and public holidays.
- The construction contractor shall use temporary noise attenuation fences to protect sensitive receptors west of the project site.
- The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
- Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.
- When not in use, motorized construction equipment shall not be left idling for more than 5 minutes.
- Stationary equipment (power generators, compressors, etc.) shall be located at the furthest practical distance from nearby noise-sensitive land uses or sufficiently shielded to reduce noise-related impacts.

Timing/Implementation: Implemented prior to approval of grading and/or building permits
Enforcement/Monitoring: City of Antioch Community Development Department

Implementation of mitigation measure 1 would help to reduce construction-generated noise levels. With mitigation, this impact would be considered ***less-than-significant***.

Recommended Condition of Approval

- Any commercial building proposed along Deer Valley Road must be set back from the centerline of Deer Valley Road at least 70 feet to fall outside of the 70 dBA CNEL noise level contour;
- Any proposed senior housing located along Deer Valley Road shall have a noise study prepared to demonstrate compliance with the City's exterior and interior noise standards. The noise study shall, as applicable, include recommendations for the appropriate methods for reducing noise levels at the sites to within the City's noise standards. The effectiveness of the mitigation, if required, shall be documented by the noise study. The noise study shall be submitted prior to the approval of tentative maps or site plans for the senior housing uses located along Deer Valley Road and shall be subject to review and approval by the City of Antioch.

IMPACT 2: WOULD THE PROJECT GENERATE EXCESSIVE GROUNDBORNE VIBRATION OR GROUNDBORNE NOISE LEVELS?

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural.

The **Table 5** data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at distances of 26 feet. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located approximately 26 feet, or further, from typical construction activities. At these distances construction vibrations are not predicted to exceed acceptable levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours.

This is a **less-than-significant** impact and no mitigation is required.

IMPACT 3: FOR A PROJECT LOCATED WITHIN THE VICINITY OF A PRIVATE AIRSTRIP OR AN AIRPORT LAND USE PLAN OR, WHERE SUCH A PLAN HAS NOT BEEN ADOPTED, WITHIN TWO MILES OF A PUBLIC AIRPORT OR PUBLIC USE AIRPORT, WOULD THE PROJECT EXPOSE PEOPLE RESIDING OR WORKING IN THE PROJECT AREA TO EXCESSIVE NOISE LEVELS?

There are no airports within two miles of the proposed project. Therefore, this is a **less-than-significant** impact and no mitigation is required.

REFERENCES

American National Standards Institute. (1998). *[Standard] ANSI S1.43-1997 (R2007): Specifications for integrating-averaging sound level meters*. New York: Acoustical Society of America.

American Standard Testing Methods, *Standard Guide for Measurement of Outdoor A-Weighted Sound Levels, American Standard Testing Methods (ASTM) E1014-08*, 2008.

ASTM E1014-12. *Standard Guide for Measurement of Outdoor A-Weighted Sound Levels*. ASTM International. West Conshohocken, PA. 2012.

ASTM E1780-12. *Standard Guide for Measuring Outdoor Sound Received from a Nearby Fixed Source.* ASTM International. West Conshohocken, PA. 2012.

Barry, T M. (1978). *FHWA highway traffic noise prediction model* (FHWA-RD-77-108). Washington, DC: U.S. Department of transportation, Federal highway administration, Office of research, Office of environmental policy.

California Department of Transportation (Caltrans), *Technical Noise Supplement, Traffic Noise Analysis Protocol*, September 2013.

Egan, M. D. (1988). Architectural acoustics. United States of America: McGraw-Hill Book Company.

Federal Highway Administration. *FHWA Roadway Construction Noise Model User's Guide.* FHWA-HEP-05-054 DOT-VNTSC-FHWA-05-01. January 2006.

Hanson, Carl E. (Carl Elmer). (2006). *Transit noise and vibration impact assessment*. Washington, DC: U.S. Department of Transportation, Federal Transit Administration, Office of Planning and Environment.

International Electrotechnical Commission. Technical committee 29: Electroacoustics. International Organization of Legal Metrology. (2013). *Electroacoustics: Sound level meters*.

International Organization for Standardization. (1996). *Acoustic - ISO 9613-2: Attenuation of sound during propagation outdoors. Part 2: General methods of calculation*. Ginevra: I.S.O.

Miller, L. N., Bolt, Beranek, & and Newman, Inc. (1981). *Noise control for buildings and manufacturing plants*. Cambridge, MA: Bolt, Beranek and Newman, Inc.

SoundPLAN. SoundPLAN GmbH. Backnang, Germany. http://www.soundplan.eu/english/

Appendix A: Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
ASTC	Apparent Sound Transmission Class. Similar to STC but includes sound from flanking paths and correct for room reverberation. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by +5 dBA and nighttime hours weighted by +10 dBA.
DNL	See definition of Ldn.
IIC	Impact Insulation Class. An integer-number rating of how well a building floor attenuates impact sounds, such as footsteps. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one-hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
NIC	Noise Isolation Class. A rating of the noise reduction between two spaces. Similar to STC but includes sound from flanking paths and no correction for room reverberation.
NNIC	Normalized Noise Isolation Class. Similar to NIC but includes a correction for room reverberation.
Noise	Unwanted sound.
NRC	Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.
RT60	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.
SEL	Sound Exposure Level. SEL is a rating, in decibels, of a discrete event, such as an aircraft flyover or train pass by, that compresses the total sound energy into a one-second event.
SPC	Speech Privacy Class. SPC is a method of rating speech privacy in buildings. It is designed to measure the degree of speech privacy provided by a closed room, indicating the degree to which conversations occurring within are kept private from listeners outside the room.
STC	Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations. The STC rating is typically used to rate the sound transmission of a specific building element when tested in laboratory conditions where flanking paths around the assembly don't exist. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

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Appendix B: Continuous Ambient Noise Measurement Results

Appendix B1: Continuous Noise Monitoring Results

Site: LT-1

Project: 210503 City of Antioch-Albers Ranch IS

Meter: LDL 820

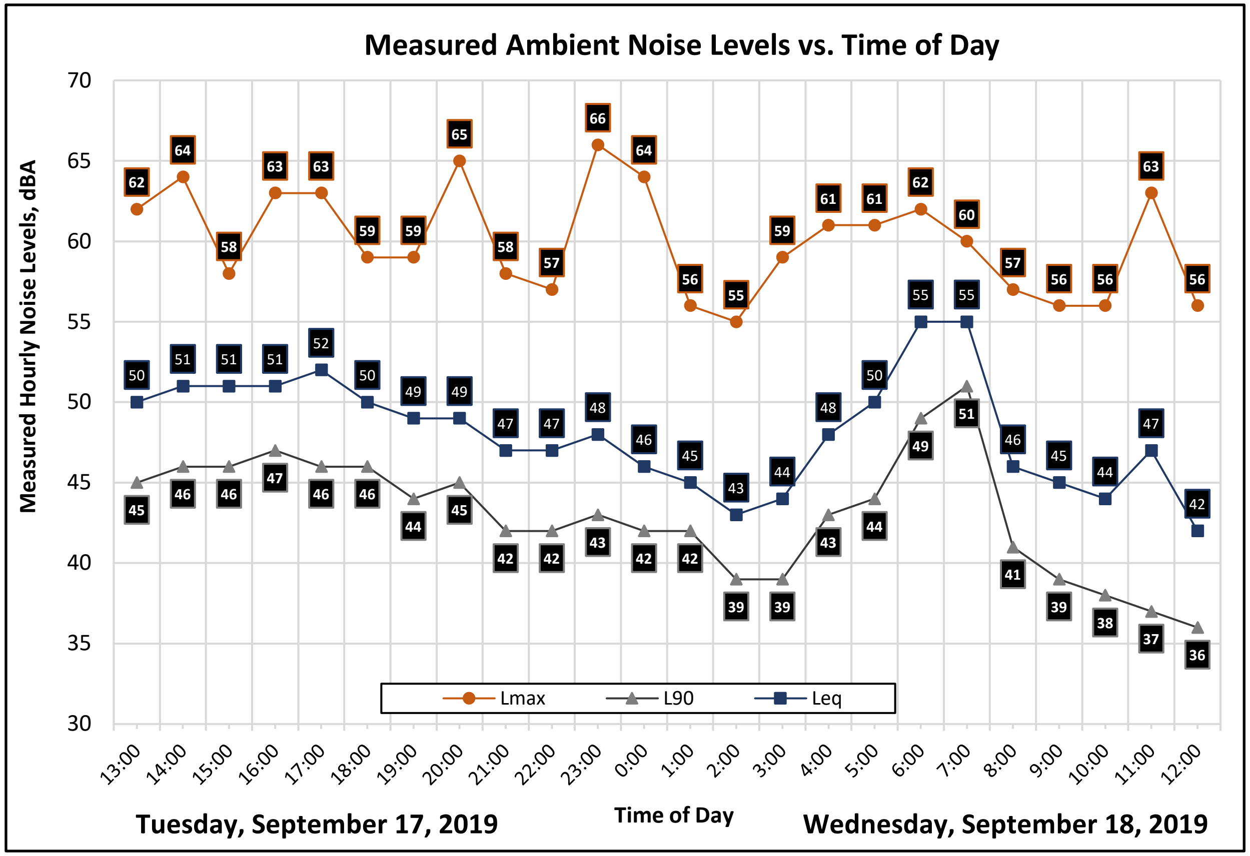
Location: Western Project Site

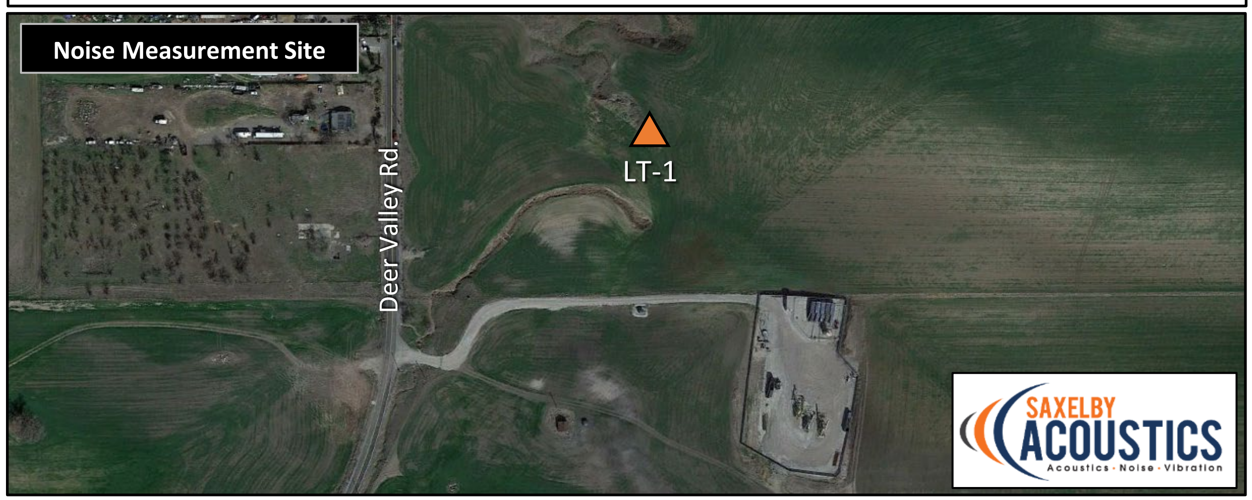
Calibrator: CAL200

Coordinates: 37.940708°, -121.771858°

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Tuesday, September 17, 2019	13:00	50	62	49	45
Tuesday, September 17, 2019	14:00	51	64	50	46
Tuesday, September 17, 2019	15:00	51	58	51	46
Tuesday, September 17, 2019	16:00	51	63	51	47
Tuesday, September 17, 2019	17:00	52	63	50	46
Tuesday, September 17, 2019	18:00	50	59	49	46
Tuesday, September 17, 2019	19:00	49	59	49	44
Tuesday, September 17, 2019	20:00	49	65	48	45
Tuesday, September 17, 2019	21:00	47	58	46	42
Tuesday, September 17, 2019	22:00	47	57	45	42
Tuesday, September 17, 2019	23:00	48	66	46	43
Wednesday, September 18, 2019	0:00	46	64	44	42
Wednesday, September 18, 2019	1:00	45	56	44	42
Wednesday, September 18, 2019	2:00	43	55	41	39
Wednesday, September 18, 2019	3:00	44	59	41	39
Wednesday, September 18, 2019	4:00	48	61	46	43
Wednesday, September 18, 2019	5:00	50	61	48	44
Wednesday, September 18, 2019	6:00	55	62	54	49
Wednesday, September 18, 2019	7:00	55	60	55	51
Wednesday, September 18, 2019	8:00	46	57	45	41
Wednesday, September 18, 2019	9:00	45	56	44	39
Wednesday, September 18, 2019	10:00	44	56	43	38
Wednesday, September 18, 2019	11:00	47	63	41	37
Wednesday, September 18, 2019	12:00	42	56	40	36
	Statistics	Leq	Lmax	L50	L90
	Day Average	50	60	47	43
	Night Average	49	60	45	43
	Day Low	42	56	40	36
	Day High	55	65	55	51
	Night Low	43	55	41	39
	Night High	55	66	54	49
	Ldn	55	Day %		67
	CNEL	56	Night %		33

*Data collected by j.c. brennan & associates, Inc.





Appendix C: Traffic Noise Calculation Inputs and Results

Appendix C-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 210503

Description: Albers Ranch IS - Existing + Creekside + Promenade Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Deer Valley Road	Lone Tree Wy to Prewett Ranch Dr	11,860	67	0	33	1.0%	1.0%	45	75	-5	234	109	50	62.4
2	Deer Valley Road	South of Prewett Ranch Dr	11,590	67	0	33	1.0%	1.0%	55	60	0	325	151	70	71.0
3	Lone Tree Way	Deer Valley Rd to Hillcrest Ave	18,960	67	0	33	1.0%	1.0%	45	80	-5	320	149	69	64.0
4	Lone Tree Way	East of Hillcrest Ave	26,950	67	0	33	1.0%	1.0%	45	85	-5	405	188	87	65.2
5	Prewett Ranch Rd	Deer Valley Rd to Hillcrest Ave	6,060	67	0	33	1.0%	1.0%	30	50	-5	85	39	18	58.4
6	Hillcrest Ave	North of Lone Tree Way	6,970	67	0	33	1.0%	1.0%	45	70	-5	164	76	35	60.6
7	Hillcrest Ave	Lone Tree Wy to Prewett Ranch Dr	11,500	67	0	33	1.0%	1.0%	45	80	-5	230	107	49	61.9
8	Hillcrest Ave	South of Prewett Ranch Dr	4,250	67	0	33	1.0%	1.0%	45	80	-5	118	55	25	57.5

Appendix C-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 210503
Description: Albers Ranch IS - Existing Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

												Contours (ft.) - No Offset			
Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	60 dBA	65 dBA	70 dBA	Level, dBA
1	Deer Valley Road	Lone Tree Wy to Prewett Ranch Dr	12,360	67	0	33	1.0%	1.0%	45	75	-5	241	112	52	62.6
2	Deer Valley Road	South of Prewett Ranch Dr	12,700	67	0	33	1.0%	1.0%	55	60	0	345	160	74	71.4
3	Lone Tree Way	Deer Valley Rd to Hillcrest Ave	19,860	67	0	33	1.0%	1.0%	45	80	-5	330	153	71	64.2
4	Lone Tree Way	East of Hillcrest Ave	28,760	67	0	33	1.0%	1.0%	45	85	-5	423	196	91	65.5
5	Prewett Ranch Rd	Deer Valley Rd to Hillcrest Ave	6,570	67	0	33	1.0%	1.0%	30	50	-5	89	41	19	58.8
6	Hillcrest Ave	North of Lone Tree Way	8,300	67	0	33	1.0%	1.0%	45	70	-5	185	86	40	61.3
7	Hillcrest Ave	Lone Tree Wy to Prewett Ranch Dr	13,460	67	0	33	1.0%	1.0%	45	80	-5	255	118	55	62.6
8	Hillcrest Ave	South of Prewett Ranch Dr	7,140	67	0	33	1.0%	1.0%	45	80	-5	167	78	36	59.8

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Appendix C-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 210503
Description: Albers Ranch IS - Baseline
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Deer Valley Road	Lone Tree Wy to Prewett Ranch Dr	17,770	67	0	33	1.0%	1.0%	45	75	-5	307	142	66	64.2
2	Deer Valley Road	South of Prewett Ranch Dr	18,890	67	0	33	1.0%	1.0%	55	60	0	450	209	97	73.1
3	Lone Tree Way	Deer Valley Rd to Hillcrest Ave	26,460	67	0	33	1.0%	1.0%	45	80	-5	400	186	86	65.5
4	Lone Tree Way	East of Hillcrest Ave	32,210	67	0	33	1.0%	1.0%	45	85	-5	456	212	98	65.9
5	Prewett Ranch Rd	Deer Valley Rd to Hillcrest Ave	8,550	67	0	33	1.0%	1.0%	30	50	-5	106	49	23	59.9
6	Hillcrest Ave	North of Lone Tree Way	8,890	67	0	33	1.0%	1.0%	45	70	-5	193	90	42	61.6
7	Hillcrest Ave	Lone Tree Wy to Prewett Ranch Dr	12,290	67	0	33	1.0%	1.0%	45	80	-5	240	111	52	62.2
8	Hillcrest Ave	South of Prewett Ranch Dr	9,340	67	0	33	1.0%	1.0%	45	80	-5	200	93	43	61.0

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Appendix C-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 210503
Description: Albers Ranch IS - Baseline Plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Deer Valley Road	Lone Tree Wy to Prewett Ranch Dr	18,270	67	0	33	1.0%	1.0%	45	75	-5	313	145	67	64.3
2	Deer Valley Road	South of Prewett Ranch Dr	20,020	67	0	33	1.0%	1.0%	55	60	0	468	217	101	73.4
3	Lone Tree Way	Deer Valley Rd to Hillcrest Ave	27,360	67	0	33	1.0%	1.0%	45	80	-5	409	190	88	65.6
4	Lone Tree Way	East of Hillcrest Ave	33,710	67	0	33	1.0%	1.0%	45	85	-5	470	218	101	66.1
5	Prewett Ranch Rd	Deer Valley Rd to Hillcrest Ave	9,080	67	0	33	1.0%	1.0%	30	50	-5	111	51	24	60.2
6	Hillcrest Ave	North of Lone Tree Way	9,930	67	0	33	1.0%	1.0%	45	70	-5	208	97	45	62.1
7	Hillcrest Ave	Lone Tree Wy to Prewett Ranch Dr	13,810	67	0	33	1.0%	1.0%	45	80	-5	259	120	56	62.7
8	Hillcrest Ave	South of Prewett Ranch Dr	11,600	67	0	33	1.0%	1.0%	45	80	-5	231	107	50	61.9

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Appendix C-5

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 210503

Description: Albers Ranch IS - Cumulative

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Deer Valley Road	Lone Tree Wy to Prewett Ranch Dr	20,350	67	0	33	1.0%	1.0%	45	75	-5	336	156	72	64.8
2	Deer Valley Road	South of Prewett Ranch Dr	18,080	67	0	33	1.0%	1.0%	55	60	0	437	203	94	72.9
3	Lone Tree Way	Deer Valley Rd to Hillcrest Ave	29,960	67	0	33	1.0%	1.0%	45	80	-5	435	202	94	66.0
4	Lone Tree Way	East of Hillcrest Ave	39,590	67	0	33	1.0%	1.0%	45	85	-5	523	243	113	66.8
5	Prewett Ranch Rd	Deer Valley Rd to Hillcrest Ave	9,300	67	0	33	1.0%	1.0%	30	50	-5	112	52	24	60.3
6	Hillcrest Ave	North of Lone Tree Way	20,210	67	0	33	1.0%	1.0%	45	70	-5	334	155	72	65.2
7	Hillcrest Ave	Lone Tree Wy to Prewett Ranch Dr	18,250	67	0	33	1.0%	1.0%	45	80	-5	312	145	67	63.9
8	Hillcrest Ave	South of Prewett Ranch Dr	15,300	67	0	33	1.0%	1.0%	45	80	-5	278	129	60	63.1

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Appendix C-6

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 210503
Description: Albers Ranch IS - Cumulative Plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Deer Valley Road	Lone Tree Wy to Prewett Ranch Dr	20,960	67	0	33	1.0%	1.0%	45	75	-5	343	159	74	64.9
2	Deer Valley Road	South of Prewett Ranch Dr	19,170	67	0	33	1.0%	1.0%	55	60	0	455	211	98	73.2
3	Lone Tree Way	Deer Valley Rd to Hillcrest Ave	30,790	67	0	33	1.0%	1.0%	45	80	-5	443	205	95	66.1
4	Lone Tree Way	East of Hillcrest Ave	40,830	67	0	33	1.0%	1.0%	45	85	-5	534	248	115	67.0
5	Prewett Ranch Rd	Deer Valley Rd to Hillcrest Ave	9,550	67	0	33	1.0%	1.0%	30	50	-5	114	53	25	60.4
6	Hillcrest Ave	North of Lone Tree Way	21,340	67	0	33	1.0%	1.0%	45	70	-5	347	161	75	65.4
7	Hillcrest Ave	Lone Tree Wy to Prewett Ranch Dr	19,810	67	0	33	1.0%	1.0%	45	80	-5	330	153	71	64.2
8	Hillcrest Ave	South of Prewett Ranch Dr	17,560	67	0	33	1.0%	1.0%	45	80	-5	304	141	66	63.7

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Appendix B

California Department of Transportation

DISTRICT 4
OFFICE OF TRANSIT AND COMMUNITY PLANNING
P.O. BOX 23660, MS–10D | OAKLAND, CA 94623-0660
www.dot.ca.gov

November 9, 2021

SCH #: 2021100264
GTS #: 04-CC-2021-00508
GTS ID: 24594
Co/Rt/Pm: CC/4/33.8

Forrest Ebbs, Community Development Director
City of Antioch
Community Development Department
P.O. Box 5007
Antioch, CA 94531

Re: Albers Ranch Project Notice of Preparation (NOP)

Dear Forrest Ebbs:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Albers Ranch Project. We are committed to ensuring that impacts to the State's multimodal transportation system and to our natural environment are identified and mitigated to support a safe, sustainable, integrated and efficient transportation system. The following comments are based on our review of the October 2021 NOP.

Project Understanding
The project includes the development of a multi-generational, single-family residential subdivision with 294 units, an assisted living facility, neighborhood commercial development, and associated improvements. The project is located along Deer Valley Road, 3.5 miles southwest of the State Route (SR)- 4/Lone Tree Way interchange in the City of Antioch.

Travel Demand Analysis
With the enactment of Senate Bill (SB) 743, Caltrans is focused on maximizing efficient development patterns, innovative travel demand reduction strategies, and multimodal improvements. For more information on how Caltrans assesses Transportation Impact Studies, please review Caltrans' Transportation Impact Study Guide.

If the project meets the screening criteria established in the City's adopted Vehicle Miles Traveled (VMT) policy to be presumed to have a less-than-significant VMT impact and exempt from detailed VMT analysis, please provide justification to support the exempt status in align with the City's VMT policy. Projects that do not meet the screening criteria should include a detailed VMT analysis in the Draft Environmental Impact Report (DEIR), which should include the following:

- VMT analysis pursuant to the City's guidelines. Projects that result in automobile VMT per capita above the threshold of significance for existing (i.e. baseline) city-wide or regional values for similar land use types may indicate a significant impact. If necessary, mitigation for increasing VMT should be identified. Mitigation should support the use of transit and active transportation modes. Potential mitigation measures that include the requirements of other agencies such as Caltrans are fully enforceable through permit conditions, agreements, or other legally-binding instruments under the control of the City.

- A schematic illustration of walking, biking and auto conditions at the project site and study area roadways. Potential safety issues for all road users should be identified and fully mitigated. Per the Interim Safety Guidance, the safety analysis may be performed by Caltrans to determine significant traffic safety impacts to the State Transportation Network (STN).

- The project's primary and secondary effects on pedestrians, bicycles, travelers with disabilities and transit performance should be evaluated, including countermeasures and trade-offs resulting from mitigating VMT increases. Access to pedestrians, bicycle, and transit facilities must be maintained.

Mitigation Strategies
Location efficiency factors, including community design and regional accessibility, influence a project's impact on the environment. Using Caltrans' *Smart Mobility 2010: A Call to Action for the New Decade*, the proposed project site is identified as a Suburban Community Neighborhood where community design is weak and regional accessibility is variable.

Given the place, type and size of the project, the DEIR should include a robust Transportation Demand Management (TDM) Program to reduce VMT and greenhouse gas emissions from future development in this area. The measures listed below have been quantified by California Air Pollution Control Officers Association (CAPCOA) and shown to have different efficiencies reducing regional VMT:

- Increased density;
- Increased location efficiency;
- Increased mixed-use development;

- Increased transit accessibility;
- Orientation of Project towards non-auto corridor;
- Location of project near bicycle network;
- Addition of affordable housing units in project;
- Incorporation of bicycle lanes in street design;
- Pedestrian network improvements;
- Traffic calming measures;
- Implementation of a neighborhood electric vehicle (EV) network, including designated parking spaces for EVs;
- Limiting parking supply;
- Unbundled parking from property costs;
- Implementation of Urban Non-Motorized Zone
- Ridesharing programs, Commute Trip Reduction programs, bike sharing programs;
- Transit and trip planning resources such as a commute information kiosk;
- Real-time transit information system;
- Transit access supporting infrastructure (including bus shelter improvements and sidewalk/ crosswalk safety facilities); and/or
- VMT Banking and/or Exchange program.

Using a combination of strategies appropriate to the project and the site can reduce VMT, along with related impacts on the environment and State facilities. TDM programs should be documented with annual monitoring reports by a TDM coordinator to demonstrate effectiveness. If the project does not achieve the VMT reduction goals, the reports should also include next steps to take in order to achieve those targets.

Please reach out to Caltrans for further information about TDM measures and a toolbox for implementing these measures in land use projects. Additionally, Federal Highway Administration's Integrating Demand Management into the Transportation Planning Process: A Desk Reference (Chapter 8). The reference is available online at: http://www.ops.fhwa.dot.gov/publications/fhwahop12035/fhwahop12035.pdf.

Transportation Impact Fees
Please identify project-generated travel demand and estimate the costs of transit and active transportation improvements necessitated by the proposed project; viable funding sources such as development and/or transportation impact fees should also be identified. We encourage a sufficient allocation of fair share contributions toward multi-modal and regional transit improvements to fully mitigate cumulative impacts to regional transportation. We also strongly support measures to increase sustainable mode shares, thereby reducing VMT.

Lead Agency
As the Lead Agency, the City of Antioch is responsible for all project mitigation, including any needed improvements to the State Transportation Network. The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures.

Thank you again for including Caltrans in the environmental review process. Should you have any questions regarding this letter, please contact Nick Hernandez at nick.hernandez@dot.ca.gov. Additionally, for future notifications and requests for review of new projects, please email LDIGR-D4@dot.ca.gov.

Sincerely,

Mark Leong

MARK LEONG
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

Sent: Monday, November 15, 2021 8:22 AM
To: Cindy Gnos <cindygnos@raneymanagement.com>
Cc: Ebbs, Forrest <febbs@ci.antioch.ca.us>
Subject: FW: Subdivision 9515, Albers Ranch, NOP for DEIR

Hello Cindy,

Please see below comments from County Flood Control on the Albers Ranch NOP.

Thanks,

Kevin Scudero
Senior Planner

☎: 925-779-6159 (Main)
☎: 925-779-6133 (Direct)
: www.antiochca.gov

City of Antioch | P.O. Box 5007, Antioch, CA 94531-5007

From: Joe Smithonic <Joe.Smithonic@pw.cccounty.us>
Sent: Monday, November 15, 2021 7:49 AM
To: Planning Division <Planning@ci.antioch.ca.us>
Cc: Michelle Cordis <michelle.cordis@pw.cccounty.us>; Scudero, Kevin <KScudero@antiochca.gov>; Jon Crawford <jcrawford@interwestgrp.com>; Little, Andrew <alittle@interwestgrp.com>
Subject: Subdivision 9515, Albers Ranch, NOP for DEIR

Hello Mr. Ebbs,

The Contra Costa County Flood Control and Water Conservation District (FC District) received the October 15, 2021 Notice of Preparation of a Draft Environmental Impact Report (DEIR) for Subdivision 9515, Albers Ranch, located south of Upper Sand Creek Basin and east of Deer Valley Road (APNs 057-042-006 and 057-050-021) in the City of Antioch (City). We submit the following recommendations for preparation of the project's DEIR:

1. We recommend that the DEIR include a map of the project area and show all parcels involved in the development.

2. We request that the DEIR provide a map of the watersheds where the project is located, including watershed boundaries.

3. In the Hydrology Section, please identify and show all existing watercourses, tributaries, and man-made drainage facilities within the project site that could be impacted by this project. The discussion should include an analysis of the capacity of the existing watercourses.

4. The Hydrology Section should quantify the amount of runoff that would be generated by the project and discuss how the runoff entering and originating from the site would be distributed between the natural watercourses, the detention basins (if proposed), and the man-made drainage facilities.

5. If improvements or work within the natural watercourses are proposed, the DEIR should discuss the scope of improvements.

6. We recommend that the DEIR address the design and construction of storm drain facilities to adequately collect and convey stormwater entering or originating within the development to the nearest adequate man-made drainage facility or natural watercourse, without diversion of the watershed.

7. The DEIR should discuss the adverse impacts of the runoff from the project site to the existing drainage facilities, and drainage problems in the downstream areas, including those areas outside of the City of Antioch.

8. The development is located within the FC District's repealed Drainage Area 104 (DA 104) boundary, which defines the watershed for Sand Creek. DA 104 is now a portion of regional Drainage Area 130 (DA 130), which defines the greater watershed for Marsh Creek. The existing and planned FC District facilities within DA 104 and DA 130 are designed to mitigate flooding on Sand Creek and further downstream on Marsh Creek.

9. The FC District facilities that would be impacted by this development include the Upper Sand Creek Basin (USCB), the Lower Sand Creek Basin (LSCB), the Sand Creek Channel, and the Marsh Creek channel. The following FC District concerns should be addressed in the DEIR:

   A. The development borders USCB and grading activities may affect FC District property. The DEIR should discuss how the development will avoid and/or mitigate impacts to the FC District's property.

   B. The development area naturally drains into Sand Creek towards LSCB. LSCB is currently in an interim condition and may not have adequate capacity to accommodate increased runoff from the development. The DEIR should discuss how the development will mitigate peak flows to pre-project levels.

10. The Hydrology Section of the DEIR should include a study that uses Contra Costa County's hydrology and hydrograph standards found at the following links:

    Hydrology: https://www.contracosta.ca.gov/5747/Hydrology-Standards
    Hydrograph: https://www.contracosta.ca.gov/5746/Hydrograph-Standards

11. The DEIR should discuss any proposed on-site and off-site drainage improvements, and include maps or drawings for the improvements.

12. If detention basin facilities are proposed, the DEIR should include a discussion of the basin design information, (i.e., capacity, sizes of inlet and outlet structures, routing, etc.) A discussion of how maintenance of these facilities would be performed and funded should also be included.

13. The DEIR should address the impacts of this project's runoff due to the increase in duration (length of time) of flows and the effect on creeks and channels downstream of the project. Whereas detention basins are capable of mitigating peak flows to pre-project levels, they increase the duration (length of time) of flows in the downstream watercourses, which saturate the channel banks and increase the potential for stream and channel erosion.

14. The DEIR should discuss how the development will comply with the current National Pollutant Discharge Elimination System (NPDES) requirements under the City's Stormwater Management and Discharge Control Ordinances and the C.3 Guidebook.

15. We recommend that the DEIR discuss permits, special conditions, and mitigation that may be required from the appropriate regulatory agencies such as the United States Army Corps of Engineers, the State Department of Fish and Game, the State Regional Water Quality Control Board, and State Department of Water Resources Division of Safety of Dams.

16. Subdivision 9515 is located within the FC District's Drainage Area 130 (DA 130) and is subject to a drainage fee in accordance with FC District Ordinance Number 2007-06. By ordinance, all building permits or subdivision maps filed in this area are subject to the provisions of the drainage fee ordinance. Effective 2021, the current fee in DA 130 is $0.82 per square foot of newly created impervious surface. The City of Antioch should collect the fees during the development process prior to the recordation of the final map.

The FC District is not the approving local agency for this project as defined by the Subdivision Map Act. As a special district, the FC District has an independent authority to collect drainage fees that is not restricted by the Subdivision Map Act. The FC District regularly adjusts its drainage fees to reflect increasing construction costs. The drainage fee rate does not vest at the time of project approval. The drainage fees due and payable will be based on the fee in effect at the time of fee collection.

17. The FC District should be included in the review of all drainage facilities that have a region-wide benefit, that impact region-wide facilities, or that impact FC District facilities. The FC District is available to provide technical assistance during the development of the DEIR, including hydrology and hydraulic information, under our Fee-for-Service program.

We appreciate the opportunity to comment on the Notice of Preparation submittal for Subdivision 9515 and welcome continued coordination with the City. We look forward to reviewing the project's DEIR which should address our comments. If you have any questions, please contact me at your earliest convenience.

Thank you,

Joe Smithonic | Staff Engineer

Contra Costa County Flood Control & Water Conservation District
255 Glacier Drive, Martinez, CA 94553
p: 925.313.2348 | f: 925.313.2333
e: joe.smithonic@pw.cccounty.us | cccpublicworks.org

STATE OF CALIFORNIA — Gavin Newsom, Governor

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

October 20, 2021

Forrest Ebbs, Director
City of Antioch, Community Development Department
P.O. Box 5007
Antioch, CA 94531-5007

Re: 2021100264, Albers Ranch Project, Contra Costa County

Dear Mr. Ebbs:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- **a.** A brief description of the project.
- **b.** The lead agency contact information.
- **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
- **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

- **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

- **a.** Alternatives to the project.
- **b.** Recommended mitigation measures.
- **c.** Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

- **a.** Type of environmental review necessary.
- **b.** Significance of the tribal cultural resources.
- **c.** Significance of the project's impacts on tribal cultural resources.
- **d.** If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

- **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
- **b.** Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
  a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
  b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
  a. If part or all of the APE has been previously surveyed for cultural resources.
  b. If any known cultural resources have already been recorded on or adjacent to the APE.
  c. If the probability is low, moderate, or high that cultural resources are located in the APE.
  d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
  a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
  b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:

a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.

b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.

a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.

b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.

c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Katy.Sanchez@nahc.ca.gov.

Sincerely,

Katy Sanchez

Katy Sanchez
Associate Environmental Planner

cc: State Clearinghouse

Appendix C

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

January 30. 2023

Regulatory Division (SPK-2005-00629)

The Olive Groves
Attn: Ms. Lucia Albers
PO Box 458
Brentwood, California 94513
albers9601@aol.com

Dear Ms. Albers:

We are responding to the November 4, 2022, request for a preliminary jurisdictional determination (JD) for The Olive Groves site submitted on your behalf by Monk & Associates, Inc. The approximately 96-acre project site is located directly east of Deer Valley Road and north of Balfour Road in Sections 8 and 9, Township 1 North, Range 2 East, MDB&M, at Latitude 37.94100°, Longitude -121.76250°, City of Antioch, Contra Costa County, California.

Based on available information, we concur with your aquatic resources delineation for the site as depicted on the enclosed drawing titled *Sheet 1. Draft Aquatic Resources Map, The Olive Grove Project Site, Antioch, California*, which was prepared by Monk & Associates, Inc. on November 3, 2022 (Enclosure 1). The approximately 0.17 acre of wetlands, 0.12 acre/530 linear feet of Sand Creek, and 0.23 acre/1,546 linear feet of unnamed tributary present within the survey area are potential jurisdictional aquatic resources ("waters of the United States") regulated under Section 404 of the Clean Water Act.

This letter verifies that the location and boundaries of wetlands were delineated consistent with the wetland definition at 33 CFR §328.3(c)(16), the 1987 *Corps of Engineers Wetlands Delineation Manual* (Wetlands Research Program Technical Report Y-87-1) and the applicable regional supplements, and the location and boundaries of non-tidal waters conform with the ordinary high water mark definition at 33 CFR §328.3(c)(7), Regulatory Guidance Letter 05-05, and any applicable regional guide.

At your request, we have completed a preliminary JD for the site. Enclosed find a copy of the *Preliminary Jurisdictional Determination Form* (Enclosure 2). Please sign and return the completed form to the address listed below within 30 days of the date of this letter. If you do not return the signed form within 30 days, we will presume concurrence and finalize the preliminary jurisdictional determination.

We recommend you provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

The delineation included herein has been conducted to identify the location and extent of the aquatic resource boundaries and/or the jurisdictional status of aquatic resources for purposes of the Clean Water Act for the particular site identified in this request. This delineation and/or jurisdictional determination may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should discuss the applicability of a certified wetland determination with the local USDA service center, prior to starting work.

You may request an approved JD for this site at any time prior to starting work within waters, including after a permit decision is made. To request an approved JD for this site, complete the attached *Request for Aquatic Resources Delineation or Jurisdictional Determination Form* (Enclosure 3) and return it to this office at the address listed below. A *Notification of Appeal Process and Request for Appeal Form* is enclosed to notify you of your options with this determination (Enclosure 4).

Please refer to identification number SPK-2005-00629 in any correspondence concerning this project. If you have any questions, please contact Matt Hirkala by email at matthew.j.hirkala@usace.army.mil or by phone at (916) 557-5148. We appreciate feedback, especially about interactions with our staff and processes. For program information or to complete our Customer Survey, visit our website at www.spk.usace.army.mil/missions/regulatory.aspx.

Sincerely,

Mary Pakenham-Walsh
Chief
CA Delta Section

Enclosures

cc: Ms. Sarah Lynch, Monk & Associates, Inc, sarah@monkassociates.com

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: The Olives Groves Attn: Ms. Lucia Albers		File No.: SPK-2005-00629	Date: January 30, 2023
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
	APPROVED JURISDICTIONAL DETERMINATION		D
→	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at *http://www.usace.army.mil/cecw/pages/reg_materials.aspx* or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Mr. Matt Hirkala Project Manager U.S. Army Corps of Engineers California Delta Section 1325 J Street, Room 1350 Sacramento, California 95814 Phone: (916) 557-5148, FAX 916-557-7803 Email: Matthew.J.Hirkala@usace.army.mil	Mr. Travis Morse Administrative Appeal Review Officer U.S. Army Corps of Engineers South Pacific Division Phillip Burton Federal Building, Post Office Box 36023 450 Golden Gate Avenue San Francisco, California 94102 Phone: 970-243-1199x1014, FAX: 971-241-2358 Email: w.travis.morse@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation and will have the opportunity to participate in all site investigations.

_______________________________ Signature of appellant or agent.	Date:	Telephone number:

PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: January 30, 2023

B. NAME AND ADDRESS OF PERSON REQUESTING PJD: Ms. Lucia Albers, PO Box 458, Brentwood, California 94513, albers9601@aol.com

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: Sacramento Regulatory Division, California Delta, The Olive Groves, SPK-2005-00629

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: CA County/parish/borough: Contra Costa County City: Antioch

Center coordinates of site (lat/long in degree decimal format):

Lat.: 37.94100 Long.: -121.76250

Universal Transverse Mercator: 608738 meters Easting, 4199991

meters Northing, Zone 10 North

Name of nearest waterbody: Sand Creek

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:

☒ Field Determination. Date(s): November 21, 2022

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
W1	37.941325	-121.766371	0.071 acre	Wetland	Section 404
W2	37.941325	-121.766371	0.100 acre	Wetland	Section 404
W3	37.941325	-121.766371	0.003 acre	Wetland	Section 404

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Unnamed Tributary	37.941325	-121.766371	0.230 acre/1,546 linear feet	Non-wetland water	Section 404
Sand Creek	37.941325	-121.766371	0.117 acre/530 linear feet	Non-wetland water	Section 404

The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor: Map: drawing titled, Sheet 1. Draft Aquatic Resources Map, The Olive Grove Project Site, Antioch, California, which was prepared by Monk & Associates, Inc. on November 3, 2022.

☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.

☒ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report. Rationale: .

☐ Data sheets prepared by the Corps: .

☐ Corps navigable waters' study: .

☐ U.S. Geological Survey Hydrologic Atlas: .

☐ USGS NHD data.

☐ USGS 8 and 12 digit HUC maps.

☒ U.S. Geological Survey map(s). Cite scale & quad name: Antioch South.

☐ Natural Resources Conservation Service Soil Survey. Citation: USDA Soils Data Mart, November 3, 2022.

☐ National wetlands inventory map(s). Cite name: .

☐ State/local wetland inventory map(s): .

☐ FEMA/FIRM maps: .

☐ 100-year Floodplain Elevation is: . (National Geodetic Vertical Datum of 1929)

☒ Photographs: ☒ Aerial (Name & Date): Attachment E. Historic Imagery of the Olive Groves Project Site, which is part of the submitted document titled, AQUATIC RESOURCES DELINEATION REPORT, dated November 4, 2022, and prepared by Monk & Associated, Inc.

Or ☒ Other (Name & Date): Attachment C. Project Site Representative Photographs, which is part of the submitted document titled, AQUATIC RESOURCES DELINEATION REPORT, dated November 4, 2022, and prepared by Monk & Associated, Inc.

OLIVE GROVES PROJECT SITE

ANTIOCH, CONTRA COSTA COUNTY, CALIFORNIA

☒ Previous determination(s). File no. and date of response letter: 200500629; March 16, 2006.

☐ Other information (please specify): .

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Matt Hirkala

Signature and date of Regulatory staff member completing PJD

2/1/2023

Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

Isolated Wetland #	Sq. Ft.	Acres
W 1	3,100	0.071
W 2	4,341	0.100
W 3	131	0.003

Feature	Lin. Ft.	Sq. Ft.	Acres
Unnamed Tributary	1,546	9,902	0.23
Sand Creek	530	5,087	0.117

Sheet 1. Draft Aquatic Resources Map
The Olive Groves Project Site
Antioch, California

Monk & Associates, Inc.
Environmental Consultants
1136 Saranap Avenue, Suite Q
Walnut Creek, California 94595
(925) 947-4867

Delineation Conducted by: Christy Owens and Sarah McNamara
Delineation Conducted on: October 19, 2022

Aerial Photograph Source: ESRI
Map Preparation Date: November 3, 2022

Appendix D

LIVE OAK
ASSOCIATES, INC.

ALBERS PROJECT SITE
TECHNICAL BIOLOGICAL REPORT
ANTIOCH, CALIFORNIA

Prepared by

LIVE OAK ASSOCIATES, INC.

Rick Hopkins, Ph.D., Principal/Senior Wildlife Ecologist
Pam Peterson, Sr. Project Manager/Plant and Wetland Ecologist
Katrina Krakow, M.S., Sr. Project Manager/Staff Ecologist

Prepared for

Angela DeRosa
Raney Management
1501 Sports Drive, Suite A
Sacramento, CA 95834

March 3, 2023 PN 2577-01

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TABLE OF CONTENTS

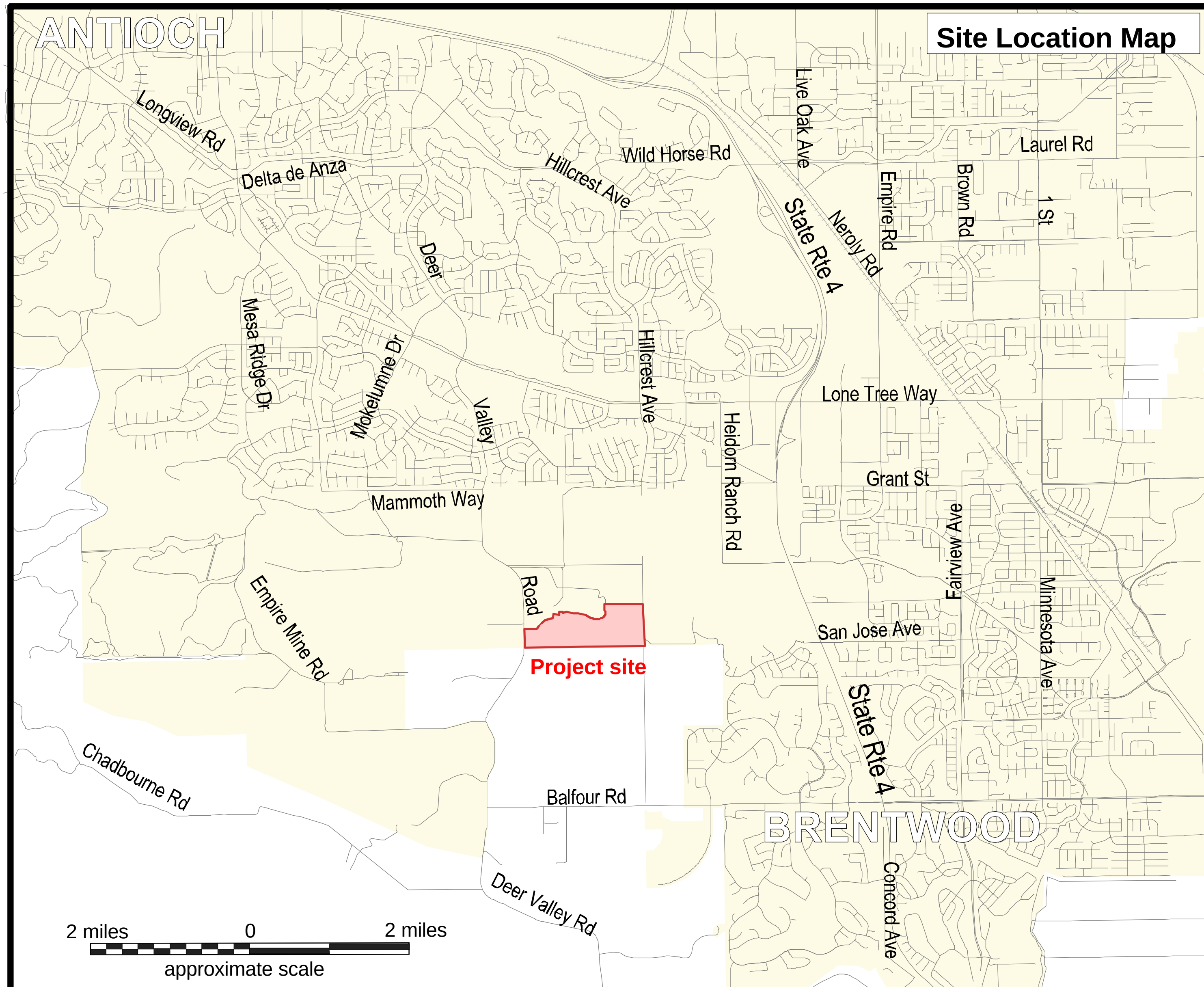
1 INTRODUCTION

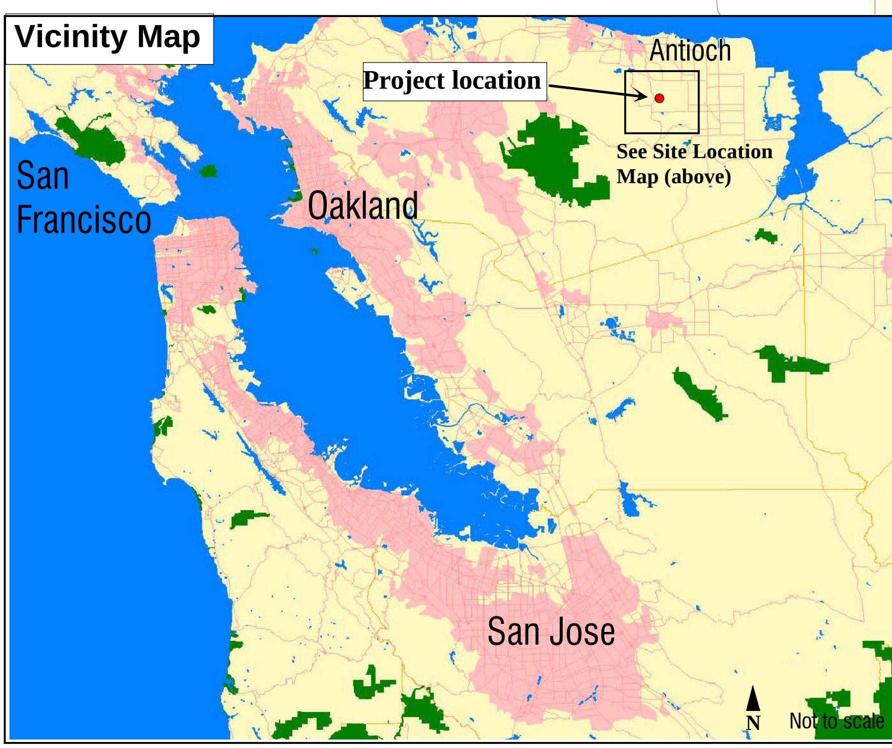
The project site located at east of Deer Valley Road south of Sand Creek south of the developed portion of the City of Antioch, Contra Costa County, California ("project site"; Figure 1) was evaluated by Live Oak Associates, Inc. (LOA) to ascertain whether or not build-out of a proposed residential development ("project") would have a significant impact, as defined by the California Environmental Quality Act (CEQA), on the biological resources of the site and region. This report describes the biotic resources of the approximately 96.47-acre project site and evaluates potential impacts to these biotic resources resulting from the proposed project. The site can be found on the Antioch South U.S.G.S. 7.5' quadrangle in Section 8 of Township 1 North, Range 2 East.

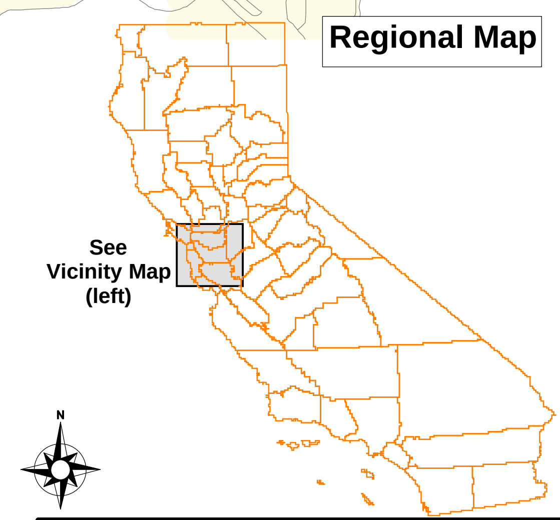
In general, the development of parcels can damage or modify biotic habitats used by sensitive plant and wildlife species. In such cases, site development may be regulated by state or federal agencies, subject to provisions of CEQA, and/or covered by local policies and ordinances. Therefore, this report addresses: 1) sensitive biotic resources potentially occurring in the project site; 2) the federal, state, and local laws regulating such resources, 3) possible significant impacts to these resources that could result from the project; and 4) mitigation measures that would reduce these impacts to a less-than-significant level as defined by CEQA.

The analysis of impacts, as discussed in Section 3.0 of this report, was based on the known and potential biotic resources of the project site discussed in Section 2.0. Sources of information used in the preparation of this analysis included: 1) the *California Natural Diversity Data Base* (RareFind 5; CDFW 2023); 2) the *California Rare Plant Rank* (CNPS 2023); 3) manuals and references related to plants and animals of the region; and 4) policies and ordinances of Antioch that relate to biotic resources.

A field survey of the project site was conducted on May 24, 2021 by LOA staff ecologist Katrina Krakow and LOA plant and wetland ecologist Pam Peterson.







LIVE OAK
ASSOCIATES, INC.

Albers Ranch
Site / Vicinity Map

Date	Project #	Figure #
3/02/2023	**2577-01**	**1**

1.1 PROJECT DESCRIPTION

Based on the Vesting Tentative Map for the Albers Property (CBG Engineers 2021), the majority of the site would be developed into a 288 single-family home subdivision, roads and assisted living development in the western portion of the site near Deer Valley Road. The remainder of the site would include approximately 40 acres of open space, approximately seven acres of water quality facilities including detention basins, and a 1.5-acre park.

2 EXISTING CONDITIONS

At the time of the field survey, the project site consisted primarily of dry-farmed wheat with some native grassland areas and a portion of the Sand Creek riparian area. Structures are absent from the site. The irregularly shaped site is bounded by Deer Valley Road to the west, dry-farmed wheat and an oil extraction area to the south, dry-farmed wheat to the east, and Sand Creek to the north. The site has hilly topography with elevations ranging from a low of approximately 180 feet (55 meters) National Geodetic Vertical Datum (NGVD) in the northwestern portion of the site to 284 feet NGVD (87 meters) in the southeastern portion of the site.

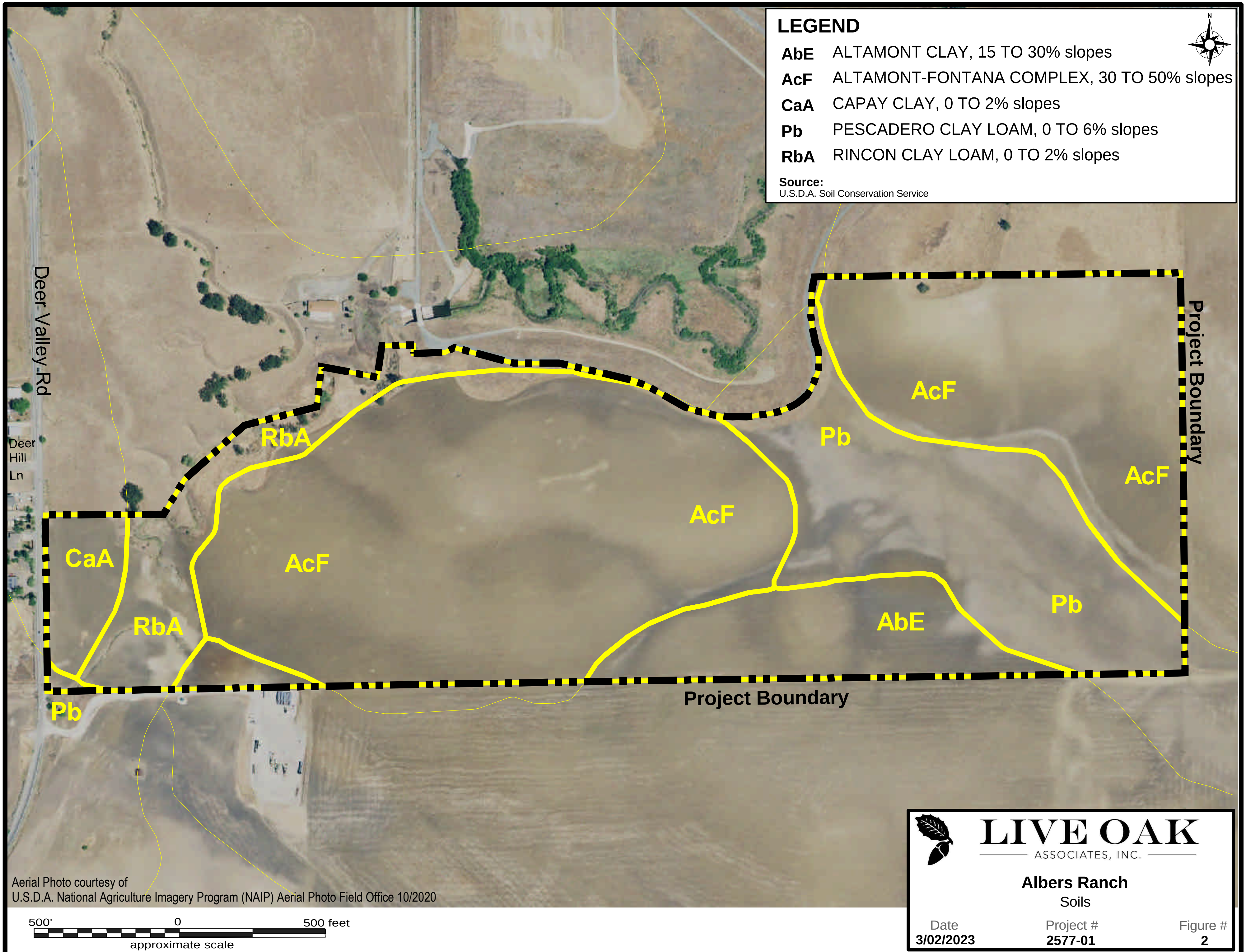
Annual precipitation in the general vicinity of the project site is about 15-20 inches, almost 85% of which falls between the months of October and March. Virtually all precipitation falls in the form of rain.

Five soil map units occur on the site (NRCS 2021) which are discussed below in Table 1 (Figure 2).

TABLE 1. SOILS OCCURRING ON THE ALBERS RANCH PROJECT SITE (NRCS 2021).

Soil Series/Soil	Map Symbol	Parent Material	Drainage/Surface Permeability	Hardpan/ Duripan	Hydric
ALTAMONT SERIES Altamont clay, 15 to 30% slopes	AbE	Residuum weathered from sandstone and shale	Well-drained/ Moderately low to moderately high	No	No*
ALTAMONT-FONTANA SERIES Altamont-Fontana complex, 30 to 50% slopes	AcF	Residuum weathered from sandstone and shale	Well-drained/Very low to moderately high	No	No*
BRIONES SERIES Briones loamy sand, 5 to 30% slopes	BdE	Residuum weathered from sandstone	Well-drained/ Moderately high	No	No
CAPAY SERIES Capay clay, 0 to 30% slopes	CaA	Clayey alluvium derived from metamorphic and sedimentary rock	Moderately well-drained/ Moderately low to moderately high	No	No*
PESCADERO SERIES Pescadero clay loam, 0 to 6% slopes	Pb	Alluvium weathered from sandstone and shale	Poorly drained/ Moderately low to moderately high	Yes	Yes
RINCON SERIES Rincon clay loam, 0 to 2% slopes	Rba	Alluvium derived from sedimentary rock	Well-drained/ Moderately low to moderately high	No	No

*Although soil is not considered a hydric soil, minor soil components of this series are considered hydric, so hydric inclusions may occur.


LEGEND
AbE ALTAMONT CLAY, 15 TO 30% slopes
AcF ALTAMONT-FONTANA COMPLEX, 30 TO 50% slopes
CaA CAPAY CLAY, 0 TO 2% slopes
Pb PESCADERO CLAY LOAM, 0 TO 6% slopes
RbA RINCON CLAY LOAM, 0 TO 2% slopes
Source:
U.S.D.A. Soil Conservation Service
N
Deer Valley Rd
Deer Hill Ln
RbA
AcF
Pb
AcF
AcF
AcF
CaA
RbA
AbE
Pb
Pb
Project Boundary
Project Boundary
Aerial Photo courtesy of
U.S.D.A. National Agriculture Imagery Program (NAIP) Aerial Photo Field Office 10/2020
500' 0 500 feet
approximate scale
LIVE OAK
ASSOCIATES, INC.
Albers Ranch
Soils
Date 3/02/2023
Project # 2577-01
Figure # 2

None of these soils are considered serpentine; therefore, special status plants adapted to serpentine soils are not expected to occur on the site, however, special status plants adapted to alkaline and hydric soils may occur on the site. Pescadero Clay Loam is considered a predominantly hydric soil. This soil type occurs within the eastern half of the site and cuts across the site. Hydric soils are soils are defined as saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions they support hydrophytic vegetation.

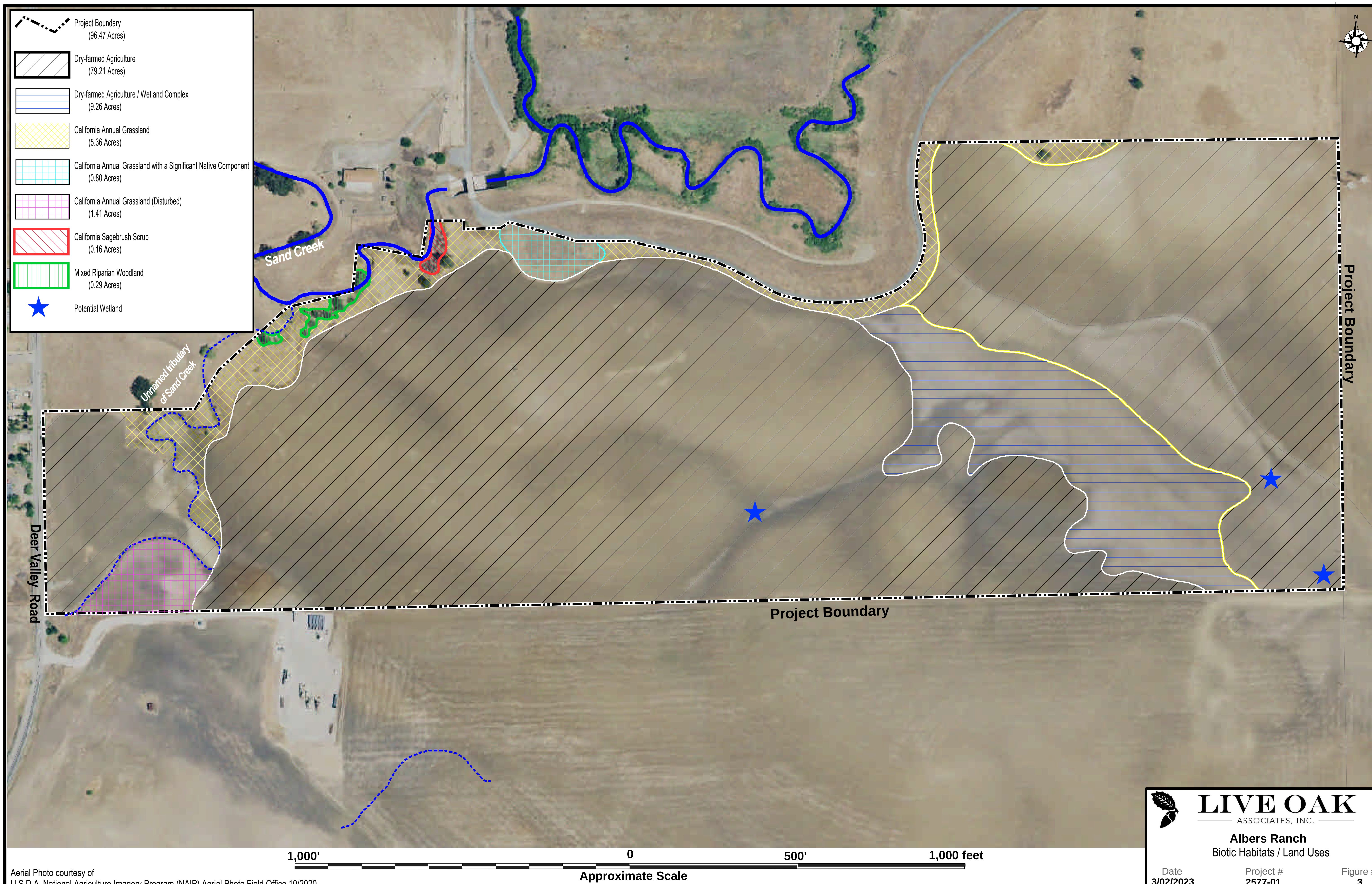
2.1 BIOTIC HABITATS

Seven land cover types have been identified on the site and these include Dry-farmed Agriculture; Dry-farmed Agriculture/Wetland Complex; California Annual Grassland; California Annual Grassland with a Significant Native Component; California Annual Grassland (Disturbed); California Sagebrush Scrub; and Mixed Riparian Woodland (Figure 2). In addition to the land cover types, hydrological features identified on the site include the channels of Sand Creek and its unnamed tributary, as well as potential wetlands occurring in the eastern portion of the site, most of the latter which are included in the area identified as Dry-farmed Agriculture/Wetland Complex.

These land cover types and hydrologic features are described in greater detail below.

2.1.1 Dry-farmed Agriculture

The majority of the site (approximately 79.21 acres) currently supports dry-farmed agriculture currently planted in wheat (*Triticum aestivum*) and is regularly disced. Historic photos of the site indicate that these areas of the site have been in agricultural production at least as far back as 1965 which was the date of the oldest historic aerials, we were able to review for the site. At the time of the May 2021 site visit, the wheat crops were already senescent. Although the senesced wheat crop was relatively dense at a height between approximately 12 and 16 inches, other plant species were found to be growing in amongst the wheat, including but not limited to, field bindweed (*Convolvulus arvensis*), yellow star thistle (*Centaurea solstitialis*), mayweed (*Anthemis* *cotula*), burclover (*Medicago polymorpha*), black mustard (*Brassica nigra*), common fiddleneck (*Amsinckia menziesii*), and common vetch (*Vicia sativa*).



Aerial Photo courtesy of
U.S.D.A. National Agriculture Imagery Program (NAIP) Aerial Photo Field Office 10/2020

LIVE OAK ASSOCIATES, INC.

Albers Ranch
Biotic Habitats / Land Uses

Date	Project #	Figure #
3/02/2023	2577-01	3

Wildlife observed within or flying over this habitat of the site during the May 2021 survey included the red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), Common raven (*Corvus corax*), Say's phoebe (*Sayornis saya*), western meadowlark (*Sturnella neglecta*), western kingbird (*Tyrannus verticalis*), western fence lizard (*Sceloporus occidentalis*), Botta's pocket gopher (*Thomomys bottae*) sign, California ground squirrel (*Otospermophilus beecheyi*), and bobcat (*Lynx rufus*) scat.

2.1.2 Dry-farmed Agriculture/Wetland Complex

A broad swale (approximately 9.26 acres) occurs within the agricultural areas of the site from the site's southeastern corner to the northern boundary near the Sand Creek corridor. Within this large swale, a complex of wetlands appears to be present. Potential wetlands throughout this area were identified based on the presence of cracked soils (a primary hydrology indicator under the U.S. Army Corps of Engineers (USACE) wetland delineation protocol) as well as the presence of some plant species with wetland indicators, including, along with their wetland indicator status, Italian rye-grass (*Festuca perennis*) (FAC), Great Valley gumplant (*Grindelia camporum*) (FACW), alkali heath (*Frankenia salina*) (FACW), and broad-leaf pepperweed (*Lepidium latifolium*) (FAC). More annual wetland species may occur in this area than was able to be identified due to the timing of the survey and the fact that most annual plants had already become senescent and unidentifiable. As will be discussed later in this report, a formal wetland delineation would need to be conducted to determine the extent of wetlands on the study area.

Animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.3 California Annual Grassland

California annual grassland habitat (approximately 5.36 acres) occurs at the edges of the dry-farmed agriculture areas. These areas do not appear to be disturbed by discing activities and are highly dominated by non-native annual grasses and forbs including wild oats (*Avena* sp.), ripgut brome (*Bromus diandrus*), serrated lettuce (*Lactuca serriola*), common fiddleneck, rose clover (*Trifolium hirtum*), and bellardia (*Bellardia trixago*).

The only animal species observed in this habitat was coyote (*Canis latrans*) dens, Botta's pocket gopher sign, and California ground squirrel burrows. Other animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.4 California Annual Grassland with a Significant Native Component

This habitat type was identified along the northern boundary of the site on a north-facing slope (approximately 0.80 acres). It appears that this area may have been temporarily disturbed when a berm was constructed along the outer edge of the Sand Creek riparian corridor along the study area boundary and was likely seeded with a mix of native bunchgrasses and forbs after the berm was constructed. Although this area is mostly dominated by annual species as described above for the California annual grassland habitat, there also was a significant native component present. Native grasses and forbs observed in this location included purple needlegrass (*Stipa pulchra*), creeping wild-rye (*Elymus triticoides*), lupine (*Lupinus* sp.), and California poppy (*Eschscholzia californica*).

Animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.5 California Annual Grassland (Disturbed)

Grasslands that have been significantly disturbed by discing, but don't appear to be part of the dry-farmed areas, occur in the southwestern portion of the site near Deer Valley Road (approximately 1.41 acres). This area supports ruderal vegetation that is adapted to such disturbance, including stinkwort (*Dittrichia graveolens*), black mustard, serrated lettuce and other non-native grasses and forbs previously described as occurring in the California annual grassland habitat.

Animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.6 California Sagebrush Scrub

A small amount of California sagebrush (*Artemisia californica*) scrub habitat (approximately 0.16 acres) occurs on the steep eastern bank of an unnamed tributary of Sand Creek. No other plant species were observed to be associated with the scrub habitat and the understory was mostly barren.

The only animal species observed in this habitat during the May 2021 site visit is the California ground squirrel. Other animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.7 Mixed Riparian Woodland

A small amount of mixed riparian habitat (approximately 0.29 acres) occurs along the southern banks of the unnamed tributary to Sand Creek. Woody riparian vegetation observed in this area included blue oak and valley oak (*Quercus douglasii* and *Q. lobata*), Fremont cottonwood (*Populus fremontii*), poison oak (*Toxicodendron diversilobum*), and almond (*Prunus dulcis*). California annual grassland habitat, as previously described, occurs in the riparian understory.

The only animal species observed in this habitat during the May 2021 site visit is the American kestrel (*Falco sparverius*) and California ground squirrel sign. Other animal species observed in the dryland agriculture are expected to use this habitat as well.

2.1.8 Sand Creek, Unnamed Tributary of Sand Creek, and Potential Wetlands

A portion of the Sand Creek channel and an unnamed tributary channel occur in the northwestern portion of the study area. These channels in the northern portion of the site had an approximate width between the tops of the banks of between 30 and 50 feet, and an Ordinary High Water width of approximately six to ten feet. In the western portion of the site, the unnamed tributary channel had an approximate top of bank width of eight to ten feet and OHW width of approximately two to three feet. These channels were completely dry at the time of the May 2021 survey. Vegetation observed within the channels was mostly dominated by broad-leaved pepperweed and black mustard, although wetland vegetation was observed within the channels that were just off site to the north. As indicated above, some woody riparian vegetation was associated with the southern banks of the unnamed tributary.

As described above, a large swale area occurs in the eastern portion of the site which appears to support a complex of small wetlands. Additionally, outside of this area, there were three discrete areas which also are potential wetlands. These three wetlands exhibited similar soils cracks and vegetation as previously described for the potential wetlands within the wetland complex area. A formal wetland delineation would be necessary to determine the extent of these wetlands.

Animal species observed in off-site areas of Sand Creek which have potential to move onto the site include the cliff swallow (*Petrochelidon pyrrhonota*) and red-winged blackbird (*Agelaius phoeniceus*). Other animal species observed in the dryland agriculture are expected to use this habitat as well.

2.2 MOVEMENT CORRIDORS

Landscape linkages are defined as "areas that allow for the movement of species from one area of suitable habitat to another. A linkage can vary from a narrow strip of habitat that only functions as a conduit for movement (i.e., a corridor) or a large area of intact habitat that is used for movement, dispersal, and other life functions such as foraging and breeding". Many wildlife linkages are broad areas of regional movement corridors for wildlife that generally includes a wide swath of land used for movement between two or more core areas for multiple regional species.

Habitat corridors are vital to terrestrial animals for connectivity between core habitat areas (i.e., larger intact habitat areas where species make their living). Connections between two or more core habitat areas help ensure that genetic diversity is maintained, thereby diminishing the probability of inbreeding depression and geographic extinctions.

The quality of habitat within the corridors is important. In general, "better" habitat has less human interference (e.g., roads, homes, etc.) and is more desirable to more species than areas with sparse vegetation and high-density roads. Movement corridors in California are typically associated with valleys, rivers and creeks supporting riparian vegetation, and ridgelines. With increasing encroachment of humans on wildlife habitats, it has become important to establish and maintain linkages, or movement corridors, for animals to be able to access locations containing different biotic resources that are essential to maintaining their life cycles.

Healthy riparian areas (supporting structural diversity, i.e., understory species to saplings to mature riparian trees) not only support a rich and diverse wildlife community but have also been shown to facilitate regional wildlife movement. Riparian areas can vary from tributaries winding through scrubland to densely vegetated riparian forests.

Beier and Loe (1992) noted five functions of corridors (rather than physical traits) that are relevant when conducting an analysis regarding the value of linkages. The following five functions should be used to evaluate the suitability of a given tract of land for use as a habitat corridor:

1. Wide ranging mammals can migrate and find mates;
2. Plants can propagate within the corridor and beyond;
3. Genetic integrity can be maintained;
4. Animals can use the corridor in response to environmental changes or a catastrophic event;
5. Individuals can recolonize areas where local extinctions have occurred.

A corridor is “wide enough” when it meets these functions for the suite of animals in the area. It is important to note that landscape linkages are used differently by different species. For instance, medium to large mammals (or some bird species) may traverse a corridor in a matter of minutes or hours, while smaller mammals or other species may take a longer period of time to move through the same corridor (e.g., measured in days, weeks and even years). For example, an individual cougar may traverse the entire length of a long narrow corridor in an hour while travel of smaller species (such as rodent or rabbit species) may best be measured as gene flow within regional populations. These examples demonstrate that landscape linkages are not simply highways that animals use to move back and forth. While linkages may serve this purpose, they also allow for slower or more infrequent movement. Width and length must be considered in evaluating the value of a landscape linkage. A long narrow corridor would most likely only be useful to wide ranging animals such as cougars and coyotes when moving between core habitat areas.

To the extent practicable, conservation of linkages should address the needs of “passage species” (those species that typically use a corridor for the express purpose of moving from one intact area to another) *and* “corridor dwellers” (slow moving species such as plants and some amphibians and reptiles that require days or generations to move through the corridor).

The project site is under intense agricultural use (i.e., predominantly dry farmed) with Sand Creek running along its northern boundary. Deer Valley Road borders the project site on its west, with Highway 4 occurring about a mile from its eastern boundary. Dense residential development occurs 0.75 miles to the north, 0.6 miles to the southeast and approximately one mile to the east. A development is under construction 0.25 miles to the north. Given that this site sits on the western edge of existing developing in Antioch, movement of wildlife across the broader landscape of the site is somewhat diminished. While birds, rodents and small to medium carnivores are likely to access the site for foraging, some of which would move across the site to forage on similar habitats on immediately adjacent parcels. The most predominate feature on site that would facilitate movement of local wildlife would be Sand Creek.

2.3 SPECIAL STATUS PLANTS AND ANIMALS

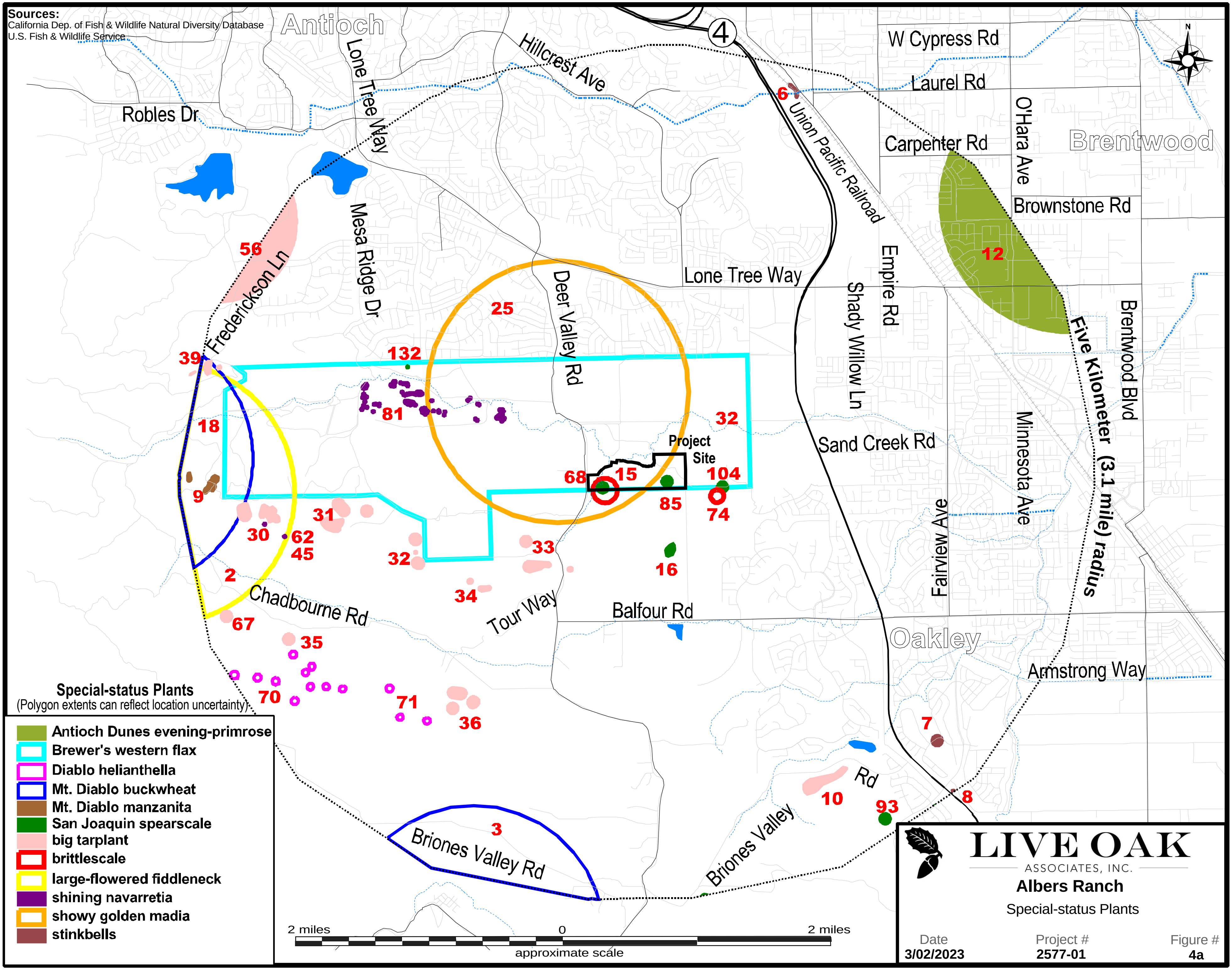
Several species of plants and animals within the state of California have low populations, limited distributions, or both. Such species may be considered “rare” and are vulnerable to extirpation as the state’s human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described more fully in Section 3.2, state and federal laws have provided the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. A sizable number of native plants and animals have been formally designated as threatened or endangered under state and federal endangered species legislation. Others have been designated as “candidates” for such listing. Still others have been designated as “species of special concern” by the CDFW. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened, or endangered (CNPS 2001). Collectively, these plants and animals are referred to as “special status species.”

A number of special status plants and animals occur in the vicinity of the project site. These species, and their potential to occur in the project site, are listed in Table 2. Sources of information for this table included *California Natural Diversity Data Base* (CDFW 2023), *Listed Plants* and *Listed Animals* (USFWS 2023), *State and Federally Listed Endangered and Threatened Animals of California* (CDFW 2023), *The California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2023), *California Bird Species of Special Concern* (Shuford and Gardall 2008), and *California Amphibian and Reptile Species of Special Concern* (Thompson et al. 2016). This information was used to evaluate the potential for special status plant and animal species that occur on the site. Figures 4a through 4c depict the locations of observations of special status plants and wildlife documented in the California Natural Diversity Data Base (CNDDB).

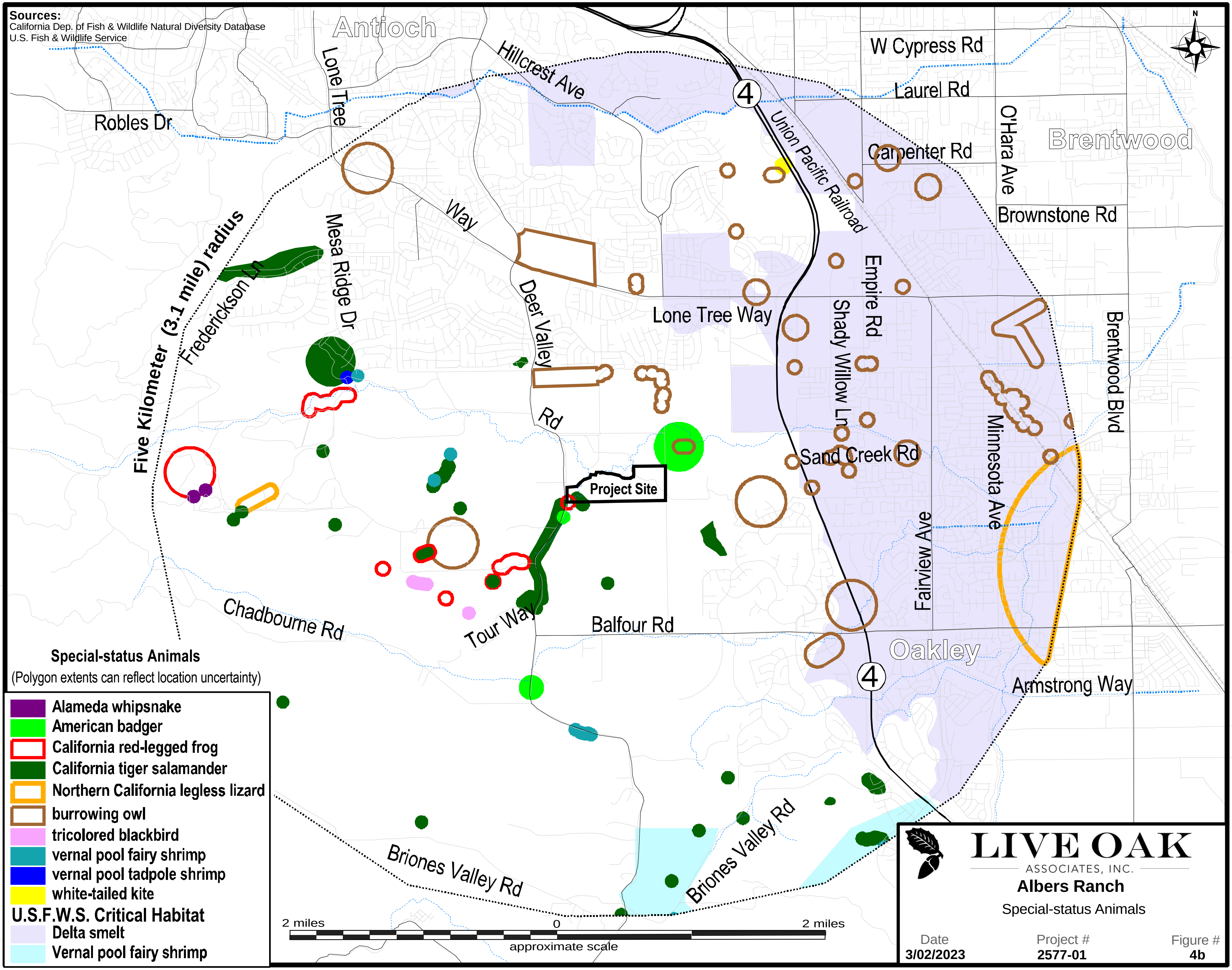
A search of published accounts for all of the relevant special status plant and animal species was conducted for the Antioch South USGS 7.5-minute quadrangle in which the project site occurs, and for the eight surrounding quadrangles (Honker Bay, Antioch North, Jersey Island, Clayton, Brentwood, Diablo, Tassajara, Byron Hot Springs) using the CNDDB Rarefind5. All species listed as occurring in these quadrangles on CNPS Lists 1A, 1B, 2, or 4 were also reviewed (Table 2).

Serpentine soils are absent from the site; as such, those species that are uniquely adapted to serpentine soils in the project's vicinity are considered absent from the site. Several other special status plant species have been ruled out on the site as they occur in habitats not present in the project site (e.g., vernal pool, coastal dunes, coastal scrub, chaparral, broad leafed forest, coastal prairie, cismontane woodland, etc.) or at elevations significantly below or above elevations of the site (approximately 55 to 87 meters NGVD).

Special status plant and animal species having potential to occur on the project site or immediate vicinity because suitable habitats are present are discussed further below.



Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
U.S. Fish & Wildlife Service
Antioch
Brentwood
Oakley
Robles Dr
Lone Tree Way
Hillcrest Ave
W Cypress Rd
Laurel Rd
Carpenter Rd
O'Hara Ave
Brownstone Rd
Union Pacific Railroad
Mesa Ridge Dr
Frederickson Ln
Deer Valley Rd
Empire Rd
Shady Willow Ln
Sand Creek Rd
Brentwood Blvd
Five Kilometer (3.1 mile) radius
Minnesota Ave
Fairview Ave
Chadbourne Rd
Tour Way
Balfour Rd
Armstrong Way
Briones Valley Rd
Project Site
4
Special-status Plants
(Polygon extents can reflect location uncertainty)
Antioch Dunes evening-primrose
Brewer's western flax
Diablo helianthella
Mt. Diablo buckwheat
Mt. Diablo manzanita
San Joaquin spearscale
big tarplant
brittlescale
large-flowered fiddleneck
shining navarretia
showy golden madia
stinkbells
2 miles
0
2 miles
approximate scale
LIVE OAK
ASSOCIATES, INC.
Albers Ranch
Special-status Plants
Date
3/02/2023
Project #
2577-01
Figure #
4a



Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
U.S. Fish & Wildlife Service
Antioch
Brentwood
Oakley
Hillcrest Ave
W Cypress Rd
Laurel Rd
Carpenter Rd
O'Hara Ave
Brownstone Rd
Union Pacific Railroad
Lone Tree
Robles Dr
Lone Tree Way
Way
Mesa Ridge Dr
Deer Valley Rd
Fredrickson Ln
Five Kilometer (3.1 mile) radius
Empire Rd
Shady Willow Ln
Sand Creek Rd
Minnesota Ave
Brentwood Blvd
Fairview Ave
Project Site
Chadbourne Rd
Tour Way
Balfour Rd
Armstrong Way
Briones Valley Rd
Briones Valley Rd
4
4
Special-status Animals
(Polygon extents can reflect location uncertainty)
Alameda whipsnake
American badger
California red-legged frog
California tiger salamander
Northern California legless lizard
burrowing owl
tricolored blackbird
vernal pool fairy shrimp
vernal pool tadpole shrimp
white-tailed kite
U.S.F.W.S. Critical Habitat
Delta smelt
Vernal pool fairy shrimp
2 miles
0
2 miles
approximate scale
N
LIVE OAK
ASSOCIATES, INC.
Albers Ranch
Special-status Animals
Date
3/02/2023
Project #
2577-01
Figure #
4b

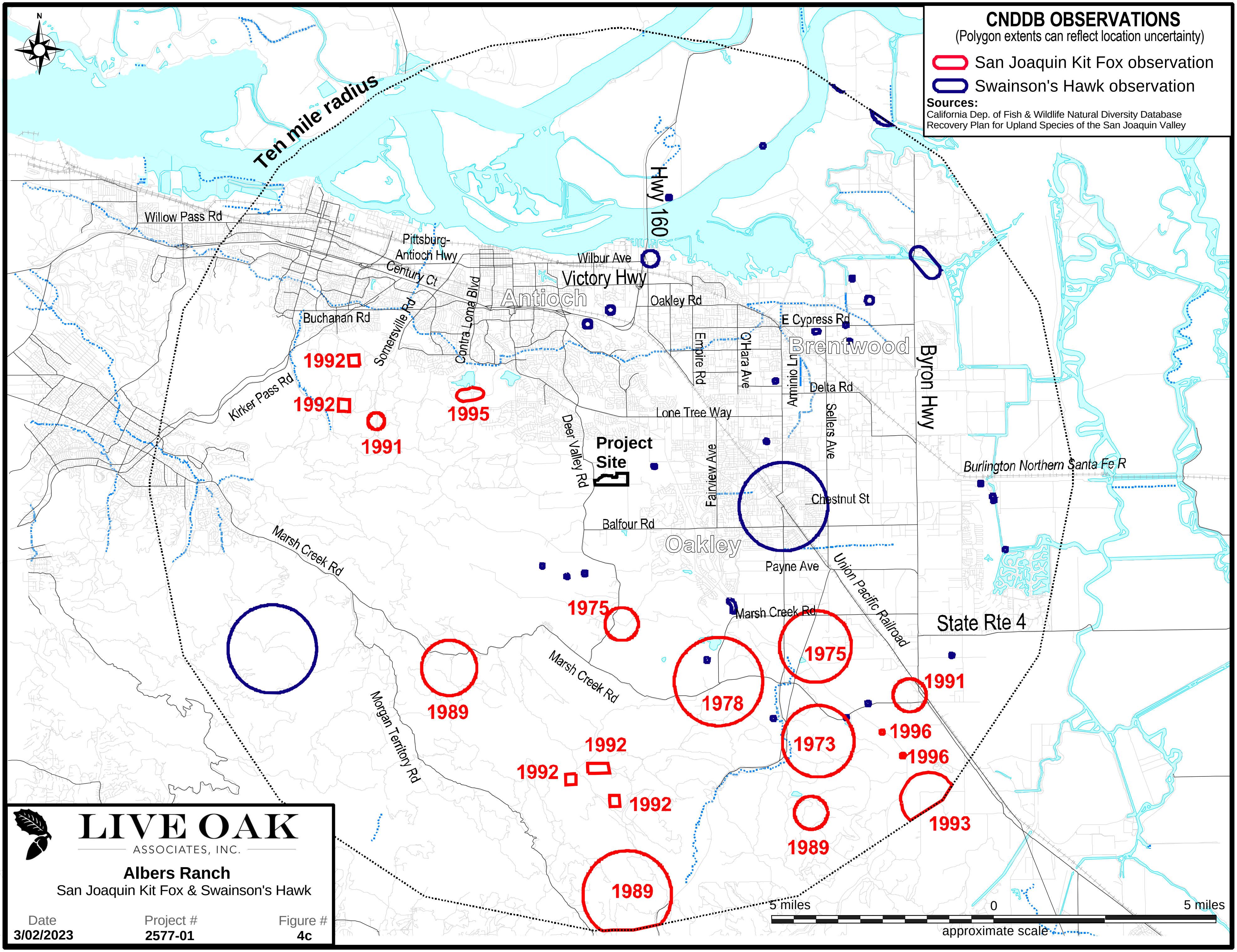

CNDDB OBSERVATIONS
(Polygon extents can reflect location uncertainty)
San Joaquin Kit Fox observation
Swainson's Hawk observation
Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
Recovery Plan for Upland Species of the San Joaquin Valley
N
Ten mile radius
Willow Pass Rd
Pittsburg-Antioch Hwy
Century Ct
Buchanan Rd
Somersville Rd
Contra Loma Blvd
Antioch
Wilbur Ave
Victory Hwy
Hwy 160
Oakley Rd
E Cypress Rd
Brentwood
Empire Rd
O'Hara Ave
Amimio Ln
Delta Rd
Byron Hwy
Sellers Ave
Lone Tree Way
Kirker Pass Rd
Deer Valley Rd
Project Site
Fairview Ave
Chestnut St
Balfour Rd
Oakley
Payne Ave
Burlington Northern Santa Fe R R
Union Pacific Railroad
Marsh Creek Rd
Marsh Creek Rd
Marsh Creek Rd
State Rte 4
Morgan Territory Rd
1992
1992
1991
1995
1975
1989
1978
1975
1991
1996
1996
1973
1992
1992
1992
1989
1993
1989
5 miles
0
5 miles
approximate scale
LIVE OAK
ASSOCIATES, INC.
Albers Ranch
San Joaquin Kit Fox & Swainson's Hawk
Date
3/02/2023
Project #
2577-01
Figure #
4c

TABLE 2. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

PLANTS (adapted from CDFW 2023 and CNPS 2023)
Threatened and Endangered Plants

Species	Status	Habitat	Occurrence in the Project Site
Large-flowered fiddleneck *Amsinckia grandiflora*	FE, CE, CRPR 1B	Habitat: Cismontane woodlands and valley and foothill grasslands. Elevation: 275-550 meters. Blooms: April-May Lifeform: Annual herb	**Unlikely**. Upland habitats of the site have been heavily disturbed by agricultural practices for many decades. The closest known occurrence is approximately 2.5 miles west of the study area and was last observed in 1887 (Occurrence #2).
Contra Costa goldfields *Lasthenia conjugens*	FE, CRPR 1B	Habitat: Alkaline soils in mesic valley and foothill grasslands and vernal pools. Elevation: 0-470 meters. Blooms: March–June Lifeform: Annual herb	**Possible**. Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.

PLANTS (adapted from CDFW 2023 and CNPS 2023)
Other plant species listed by CNPS

Species	Status	Habitat	Occurrence in the Project Site
California androsace *Androsace elongata*	CRPR 4.2	Habitat: Chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper, and valley and foothill grassland. Elevation: 150-1200 meters. Blooms: March–June Lifeform: Annual herb	**Unlikely.** Only very limited and marginal habitat occur within the riparian and scrub habitat of the study area for this species.
Slender silver moss *Anomobryum julaceum*	CRPR 2	Habitat: Damp rock and soil outcrops usually on roadcuts found in broadleafed upland forest, lower montane coniferous forest, and north coast coniferous forest Elevation: 100-1000 meters. Blooming period: N/A Lifeform: Moss	**Absent.** Suitable habitat for this species is absent from the study area.
Mt. Diablo manzanita *Arctostaphylos auriculata*	CRPR 1B	Habitat: Chaparral (sandstone) and cismontane woodland un canyons and on slopes. Elevation: 135-440 meters. Blooming period: January-March Lifeform: Perennial evergreen shrub	**Absent.** No manzanita shrubs were observed on the study area during the May 2021 survey.

Species	Status	Habitat	Occurrence in the Project Site
Contra Costa manzanita *Arctostaphylos manzanita ssp. laevigata*	CRPR 1B	Habitat: Chaparral especially on rocky slopes. Elevation: 430-1410 meters. Blooming period: January-March Lifeform: Perennial evergreen shrub	**Absent.** No manzanita shrubs were observed on the study area during the May 2021 survey.
Alkali milk-vetch *Astragalus tener var. tener*	CRPR 1B	Habitat: Occurs in alkaline soils in valley and foothill grassland and in vernal pools. Elevation: 1-60 meters. Blooms: March-June Lifeform: Annual herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Heartscale *Atriplex cordulata*	CRPR 1B	Habitat: Saline or alkaline soils of chenopod scrub, meadows and seeps, and sandy valley and foothill grassland. Elevation: 0-560 meters. Blooms: April-October Lifeform: Annual herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Brittlescale *Atriplex depressa*	CRPR 1B	Habitat: Alkaline clay soils in chenopod scrub, meadows and seeps, playas, valley and foothill grasslands, and vernal pools. Elevation: 1-320 meters. Blooms: April-October Lifeform: Annual herb;	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Lesser saltscale *Atriplex minuscula*	CRPR 1B	Habitat: Occurs in alkaline and sandy soils in chenopod scrub, playas, and valley and foothill grasslands. Elevation: 15-200 meters Blooms: May-October Lifeform: Annual herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Big tarplant *Blepharizonia plumosa*	CRPR 1B	Habitats: Valley and foothill grassland, usually on clay soil. Elevation: 30-505 meters. Blooms: July-October Lifeform: Annual herb	**Unlikely.** Although there are several occurrences of this species to the west and southwest of the study area, potential habitat for this species would be limited to the small amount of grassland habitat occurring at the edges of the cultivated wheat fields.
Mt. Diablo fairy lantern *Calochortus pulchellus*	CRPR 1B	Habitat: Chaparral, cismontane woodland, riparian woodland, and valley and foothill grasslands. Elevation: 30-840 meters. Blooms: April- June Lifeform: Perennial herb	**Unlikely.** Although there are several occurrences of this species to the west and southwest of the study area, potential habitat for this species would be limited to the small amount of grassland habitat occurring at the edges of the cultivated wheat fields.

Species	Status	Habitat	Occurrence in the Project Site
Congdon's tarplant *Centromadia parryi ssp. congdonii*	CRPR 1B	Habitat: Occurs on valley and foothill grasslands on alkaline soils. Elevation: 0-230 meters. Blooms: May-November Lifeform: Annual herb	**Unlikely.** While alkaline soils are present on the site and while wetlands and grasslands at the edges of the cultivated wheat fields could provide marginal potential habitat for this species, there are no known occurrences within a three-mile radius of the study area.
Hispid salty bird's-beak *Chloropyron molle ssp. hispidum*	CRPR 1B	Habitats: Occurs in alkaline soils in meadows and seeps, playas, and valley and foothill grassland. Elevation: 1-155 meters. Blooms: June-September. Lifeform: Annual herb	**Unlikely.** While wetlands on the site may provide marginally suitable habitat for this species, there are no known occurrences of this species within a three-mile radius of the site.
Hospital Canyon larkspur *Delphinium californicum ssp. interius*	CRPR 1B	Habitats: Chaparral (openings), cismontane woodland (mesic), coastal scrub. Elevation: 195-635 meters Blooms: April-June Lifeform: Perennial herb	**Unlikely.** Habitat is extremely limited on the site for this species, the study area is well below the elevation range for this species, and there are no known occurrences within a three-mile radius of the study area.
Recurved larkspur *Delphinium recurvatum*	CRPR 1B	Habitat: Chenopod scrub, cismontane woodland, and valley and foothill grasslands. Elevation: 3-750 meters. Blooms: March-June. Lifeform: Perennial herb	**Unlikely.** Habitat is extremely limited on the site for this species and there are no known occurrences within a three-mile radius of the study area.
Dwarf downingia *Downingia pusilla*	CRPR 2B	Habitats: Valley and foothills grassland (mesic); vernal pools Elevation: 1-445 meters Blooms: March-May Lifeform: Annual herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Lime Ridge eriastrum *Eriastrum etterae*	CRPR 1B	Habitats: Chaparral (openings or edges) in alkaline or semi alkaline, sandy soils Elevation: 200-655 meters Blooms: June-July Lifeform: Annual herb	**Unlikely.** Habitat is extremely limited on the site for this species, the study area is well below the elevation range for this species, and there are no known occurrences within a three-mile radius of the study area.
Antioch Dunes buckwheat *Eriogonum nudum var. psychicola*	CRPR 1B	Habitats: Inland dunes Elevation: 0-20 meters Blooms: July-October Lifeform: Perennial Herb	**Absent.** Suitable habitat is absent from the study area for this species.
Mt. Diablo buckwheat *Eriogonum truncatum*	CRPR 1B	Habitat: Occurs in chaparral, coastal scrub, and valley and foothill grasslands. Elevation: 3-350 meters. Blooms: April-December Lifeform: Annual herb	**Unlikely.** Habitat is extremely limited on the site for this species, the study area is well below the elevation range for this species, and there are no known occurrences within a three-mile radius of the study area.

Species	Status	Habitat	Occurrence in the Project Site
Jepson's coyote-thistle *Eryngium jepsonii*	CRPR 1B	Habitats: Occurs in valley and foothill grassland and vernal pools. Elevation: 3-300 meters. Blooms: April-August Lifeform: Perennial herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Contra Costa wallflower *Erysimum capitatum var. angustatum*	CRPR 1B	Habitats: Inland Dunes Elevation: 3-20 meters Blooms: March-July Lifeform: Perennial herb	**Absent.** Suitable habitat is absent from the study area for this species.
Diamond-petaled California poppy *Eschscholzia rhombipetala*	CRPR 1B	Habitat: Occurs in valley and foothill grassland with alkali and clay soils. Elevation: 0-975 meters. Blooms: March-April Lifeform: Annual herb.	**Unlikely.** Habitat is extremely limited on the site for this species, the study area is well below the elevation range for this species, and there are no known occurrences within a three-mile radius of the study area.
San Joaquin spearscale *Extriplex joaquinana*	CRPR 1B	Habitat: Occurs in chenopod scrub, meadows and seeps, playas, and valley and foothill grasslands on alkaline soils. Elevation: 1-835 meters. Blooms: April-October Lifeform: Annual herb	**Possible**. This species was documented on the site on both banks of the unnamed tributary in the western portion of the site in 1989 (Occurrence #15) and in 2005 one plant was observed near the southeastern boundary of the study area (Occurrence #85). Alkaline wetlands and also alkaline grasslands at the edges of the cultivated wheat fields provide potential habitat for this species.
Stinkbells *Fritillaria agrestis*	CRPR 4.2	Habitats: Occurs in chaparral, valley grassland, foothill woodland, wetland, and riparian habitats, and can be associated with serpentine soils. Elevation: 10-1555 meters. Blooms: Mar-Jun Lifeform: Perennial herb	**Unlikely.** Habitats of the study area are extremely marginal for this species and serpentine soils are absent. The closest documented occurrence is almost three miles west of the site (Occurrence #9).
Toren's grimmia *Grimmia torenii*	CRPR IB	Habitats: Occurs in openings, rock outcrops, boulders, rock walls, carbonate, and volcanic areas in chaparral, cismontane woodland, and lower montane coniferous forests Elevation: 325-1160 meters Blooms: N/A Lifeform: Moss	**Absent.** Suitable habitat is absent from the study area for this species.

Species	Status	Habitat	Occurrence in the Project Site
Diablo helianthella *Helianthella castanea*	CRPR 1B	Habitat: Occurs in cismontane woodland, coastal scrub, chaparral, riparian woodland and broadleaved upland forest. Elevation: 60-1300 meters. Blooms: March-June Lifeform: Perennial herb	**Absent.** This perennial species would have been observed if present during the May 2021 survey and it was not observed.
Brewer's western flax *Hesperolinon breweri*	CRPR 1B	Habitat: Usually occurs on serpentine soils of chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 30-900 meters. Blooms: May–July. Lifeform: Annual herb	**Absent.** Serpentine soils are absent from the site.
Showy golden madia *Madia radiata*	CRPAR 1B	Habitat: Cismontane woodland; valley and foothill grassland Elevation: 25-1215 meters Blooms: March-May Lifeform: Annual herb	**Unlikely.** Habitats of the study area are extremely marginal for this species and limited to the small amount of undisturbed grasslands at the margins of the wheat fields.
Hall's bush-mallow *Malcothamnus hallii*	CRPR 1B	Habitat: Chaparral and coastal scrub Elevation: 10-760 meters Blooms: April-October Lifeform: Perennial evergreen shrub	**Absent.** This perennial shrub would have been identifiable if present during the May 2021 survey and it was not observed.
Lime Ridge navarretia *Navarretia gowenii*	CRPR 1B	Habitat: Chaparral Elevation: 108-305 meters Blooms: May-June Lifeform: Annual herb	**Absent.** Suitable habitat is absent from the study area for this species.
Shining navarretia *Navarretia nigelliformis ssp. radians*	CRPR 1B	Habitat: Occurs in cismontane woodlands, valley and foothill grasslands, and vernal pools. Elevation: 76-1000 meters. Blooms: April-July Lifeform: Annual herb;	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Antioch Dunes evening-primrose *Oenothera deltoides spp. howellii*	CRPR 1B	Habitat: Inland dunes Elevation: 0-30 meters Blooms: March-September Lifeform: Perennial herb	**Absent.** Suitable habitat is absent from the study area for this species.
Mt. Diablo phacelia *Phacelia phaceliodes*	CRPR 1B	Habitat: Chaparral and cismontane woodland; rocky soils Elevation: 500-1370 meters Blooms: April-May Lifeform: Annual herb	**Absent.** Suitable habitat is absent from the study area for this species.
Bearded popcornflower *Plagiobothrys hystriculus*	CRPR 1B	Habitat: Often in vernal swales. Also found in vernal pool margins and in mesic valley and foothill grassland Elevation: 0-274 meters Blooms: April-May Lifeform: Annual herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.

Species	Status	Habitat	Occurrence in the Project Site
California alkali grass *Puccinellia simplex*	CRPR 1B	Habitat: Occurs in alkaline, vernally mesic, sinks, flats, and lake margins within chenopod scrub, meadows and seeps, valley and foothill grasslands, and vernal pools. Elevation:2-930 meters. Blooms: March-May Lifeform: Annual grass	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Rock sanicle *Sanicula saxatalis*	CRPR 1B	Habitat: Rocky, scree, and talus in broadleaved upland forest, chaparral, and valley and foothill grassland Elevation: 620-1175 meters Blooms: April-May Lifeform: Perennial herb	**Absent**. No suitable habitat occurs in the study area for this species.
Chaparral ragwort *Senecio aphanactis*	CRPR 2B	Habitat: Sometimes in alkaline soils; chaparral, cismontane woodland and coastal scrub Elevation: 15-800 meters Blooms: January-May Lifeform: Annual herb	**Absent**. No suitable habitat occurs in the study area for this species.
Long-styled sand-spurrey *Spergularia macrotheca var. longistyla*	CRPR 1B	Habitat: Occurs in alkaline meadows and seeps and marshes and swamps. Elevation: 0-255 meters. Blooms: February-May Lifeform: Perennial herb	**Possible.** Wetlands on the site may provide suitable habitat for this species although these wetlands have been heavily disturbed by agricultural practices for many decades.
Keck's checkerbloom *Sidalcea keckii*	CRPR 1B	Habitat: Serpentinite and clay soils in cismontane woodland and valley and foothill grassland Elevation: 75-650 meters Blooms: April-June Lifeform: Annual herb	**Absent**. No suitable habitat occurs in the study area for this species.
Mt. Diablo jewel-flower *Streptanthus hispidus*	CRPR 1B	Habitat: Occurs in rocky areas of chaparral and valley and foothill grasslands. Elevation: 365-1200 meters. Blooms: March-June Lifeform: Annual herb;	**Absent**. No suitable habitat occurs in the study area for this species.
Coastal triquetrella *Triquetrella californica*	CRPR 1B	Habitat: Coastal bluff scrub and coastal scrub Elevation: 10-100 meters Blooms: N/A Lifeform: Moss	**Absent**. No suitable habitat occurs in the study area for this species.
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	CRPR 1A	Habitat: Occurs in alkaline soils of valley and foothill grassland. Elevation: 1-455 meters. Blooms: March-April Lifeform: Annual herb	**Unlikely.** Habitats of the study area are extremely marginal for this species and limited to the small amount of undisturbed grasslands at the margins of the wheat fields. Additionally, this species was last observed in the region in the late 1800's and early 1900's.

Species	Status	Habitat	Occurrence in the Project Site
Oval-leaved Viburnum *Viburnum ellipticum*	CRPR 2B	Habitat: Chaparral, cismontane woodland, and lower montane coniferous forest Elevation: 215-1400 meters Blooms: May-June Lifeform: Perennial deciduous shrub	**Absent**. No suitable habitat occurs in the study area for this species.

ANIMALS (CONTINUED ADAPTED FROM CDFW 2023 AND USFWS 2023)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	**Status**	**Habitat**	**Occurrence in the Project Site**
Lange's metalmark butterfly *Apodemia mormo langei*	FE	Occurs in riverbank sand dunes supporting its host plant Eriogonum nudum var. auriculatum.	**Absent.** The site does not support suitable habitat for this species additionally, the hose plant was not observed during the 2021 site visit. This species occurs on the Antioch Dunes.
Conservancy fairy shrimp *Branchinecta conservatio*	FE	Occurs in large, deep vernal pools and lakes of California with water into June at elevations from 5 to 145 meters.	**Unlikely.** Although a seasonal wetland complex in the eastern portion of the site is potentially capable of supporting vernal pool branchiopods, this species has not been documented in Contra Costa County. The nearest documented occurrence of this species is more than eight miles north of the site in Solano County.
Longhorn fairy shrimp *Branchinecta longiantenna*	FE	Occurs in ephemeral wetlands and vernal pools of California.	**Unlikely.** Although a seasonal wetland complex in the eastern portion of the site is potentially capable of supporting vernal pool branchiopods, the site occurs several miles beyond the northern end of this species' range.
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	Occurs in vernal pools of California.	**Possible.** A seasonal wetland complex in the eastern portion of the site is potentially capable of supporting vernal pool branchiopods. This species is known to occur in the region, with the nearest documented observation located approximately one mile west of the site.
Vernal pool tadpole shrimp *Lepidurus packardi*	FE	Occurs in vernal pools of California. Vernal pools and swales in the Sacramento Valley containing clear to highly turbid water.	**Possible.** A seasonal wetland complex in the eastern portion of the site is potentially capable of supporting vernal pool branchiopods. This species is known to occur in the region, with the nearest documented observation located approximately two miles northwest of the site.

Species	Status	Habitat	Occurrence in the Project Site
Steelhead - Central Valley DPS *Oncorhynchus mykiss irideus*	FT	Spawn in freshwater rivers or streams in the spring and spend the remainder of their life in the ocean.	**Absent.** Steelhead are not known to occur within this reach of Sand Creek. Additionally, there is no recorded occurrences within three miles of the site.
Longfin smelt *Spirinchus thaleichthys*	CT, CSC	Anadromous. In California, occurs in Sacramento-San Joaquin estuary and one record from Monterey Bay. Spawns in sandy to gravely substrates near the ocean November to June; some populations are landlocked.	**Absent.** Longfin smelt are not known to occur within this reach of Sand Creek. Additionally, there is no recorded occurrences within three miles of the site.
California tiger salamander (CTS) *Ambystoma californiense*	FT/CT	Breeds in vernal pools and stock ponds of central California; adults aestivate in grassland habitats adjacent to the breeding sites.	**Possible.** CTS are known to previously occur within the tributary of Sand Creek at the southwestern corner of the site.
Foothill yellow-legged frog (FYLF) *Rana boylii*	CE/CSC	Occurs in swiftly flowing streams and rivers with rocky substrate with open, sunny banks in forest, chaparral, and woodland habitats, and can sometimes be found in isolated pools.	**Absent.** Habitat onsite is not suitable for the FYLF, additionally, FYLF are not known to occur within three miles of the site.
California red-legged frog (CRLF) *Rana aurora draytonii*	FT/CSC	Rivers, creeks and stock ponds of the Sierra foothills and Bay Area, preferring pools with overhanging vegetation.	**Possible.** CRLF are known to previously occur within the tributary of Sand Creek at the southwestern corner of the site.
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT, CT	Occurs in chaparral foothills, shrublands with scattered grass patches, rocky canyons, and watercourses. Occurs in the San Francisco Bay area including Alameda, Contra Costa, Santa Clara and San Joaquin Counties, CA.	**Absent.** Suitable habitat for this species is absent from the site.
San Joaquin whipsnake *Masticophis flagellum ruddocki*	CSC	Open, dry habitats with little or no tree cover. Found in valley grasslands and saltbush scrub in the San Joaquin Valley.	**Absent.** The site is not within the range of the San Joaquin whipsnake.

Species	Status	Habitat	Occurrence in the Project Site
Giant garter snake *Thamnophis gigas*	FT, CT	Habitat requirements consist of (1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; (3) grassy banks and openings in waterside vegetation for basking; and (4) higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter.	**Absent.** The site is not within the range of the giant garter snake.
American peregrine falcon *Falco peregrines anatum*	CP	Individuals breed on cliffs in the Sierra or in coastal habitats; occurs in many habitats of the state during migration and winter.	**Absent.** Suitable habitat for this species is absent from the site and this species is not known to occur within three miles of the site.
California least tern *Sterna antillarum browni*	FE, CE, CP	Occurs in central to southern California April to November. Found in and near coastal habitat including coasts, beaches, bays, estuaries, lagoons, lakes, and rivers.	**Absent.** Although this species may fly over the site during migration, suitable foraging and breeding habitat are absent from the site.
Bank swallow *Riparia riparia*	CT	Occurs in open areas near flowing water, nests in steep banks along inland water or coast. State-wide.	**Absent.** Suitable habitat for this species is absent from the site.
Tricolored blackbird *Agelaius tricolor*	CSC/ CT	Breeds near fresh water in dense emergent vegetation.	**Unlikely.** Although suitable nesting habitat appears to be present within the wetland area of Sand Creek to the north of the site, this species is unlikely to nest on the site itself. The nearest documented observation of this species is more than a mile from the site.
Swainson's hawk (SWHA) *Buteo swainsoni*	CT	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands or alfalfa fields supporting rodent populations.	**Possible.** Trees along the margins of the site are potentially suitable for SWHA nesting and the remainder of the site is suitable foraging habitat for this species. There have been 30 documented sightings within a ten-mile radius of the project site (Figure 4c) with the closest being within a quarter mile of the site. Therefore, Swainson's hawks may occur onsite.

Species	Status	Habitat	Occurrence in the Project Site
San Joaquin kit fox *Vulpes macrotis mutica*	FE, CT	Frequents desert alkali scrub and annual grasslands and may forage in adjacent agricultural habitats. Utilizes enlarged (4 to 10 inches in diameter) ground squirrel burrows as denning habitat.	**Unlikely.** No San Joaquin kit fox burrows were observed on the site during the field survey in 2021, but an extensive burrow survey was not conducted. There were 18 documented sightings within a ten-mile radius of the project site with records ranging from 1973-1996 (Figure 4c). Thus, there has not been any record of kit fox within the Sand Creek area for more than 25 years. The site has been highly modified for agricultural use and, as a result, provides only marginal foraging and dispersal habitat for the kit fox.

ANIMALS (adapted from CDFW 2023 and USFWS 2023)
State Species of Special Concern and Protected Species

Species	Status	Habitat	Occurrence in the Project Site
Sacramento perch *Archoplites interruptus*	CSC	Occurs in sloughs, slow-moving rivers, and large lakes. They are not known from their historic range, and most known locations are locations where this species has been planted. Less than 25 populations are known (CDFW species accounts).	**Absent.** Sacramento perch are not known to occur within this reach of Sand Creek. Additionally, there is no recorded occurrences within three miles of the site.
California glossy snake *Arizona elegans occidentallis*	CSC	Occurs in arid areas with grassland, scrub, chaparral, and rocky washes. This species is nocturnal and spends the day in burrows.	**Absent.** Habitats required by this species is absent from the site. Additionally, the nearest recorded observation of this species is more than three miles from the site.
Northern California legless lizard *Anniella pulchra*	CSC	The NCLL (previously called black legless lizard) occurs mostly underground in warm moist areas with loose soil and substrate. The NCLL occurs in habitats including sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks.	**Absent.** Habitats required by northern California legless lizards are absent from the site, as the site lacks sandy soils. Additionally, the nearest documented observation of this species is approximately 2.5 miles from the site.
Coast horned lizard *Phrynosoma blainvillii*	CSC	Occurs in grasslands, scrublands, oak woodlands, etc. of central California. Common in sandy washes with scattered shrubs.	**Unlikely.** Habitats required by coast horned lizards are only marginally suitable, as the site lacks sandy soils. The nearest documented observation of this species is approximately two miles to the south of the site.

Species	Status	Habitat	Occurrence in the Project Site
Western pond turtle (WPT) *Actinemys marmorata*	CSC	Intermittent and permanent waterways including streams, marshes, rivers, ponds and lakes. Open slow-moving water of rivers and creeks of central California with rocks and logs for basking.	**Possible.** Sand Creek and the tributary of Sand Creek occurring on the site does not support water year-round, however it appears wetlands exist adjacent to the site, therefore, WPT could move onto the site from time to time, especially during wet periods. The nearest recorded observation of this species is more than three miles from the site.
White-tailed kite (WTK) *Elanus leucurus*	CP	Open grasslands and agricultural areas throughout central California.	**Possible.** Trees along the margins of the site provide potentially suitable nesting habitat and the remainder of the site is suitable foraging habitat for the WTK. The nearest recorded observation of this species is approximately 2.5 miles from the site.
Northern harrier *Circus cyaneus*	CSC	Frequents meadows, grasslands, open rangelands, freshwater emergent wetlands; uncommon in wooded habitats.	**Possible.** Suitable habitat for this species occurs onsite.
Golden eagle (GE) *Aquila chrysaetos*	CP	Typically frequents rolling foothills, mountain areas, sage-juniper flats and desert.	**Possible.** Although suitable breeding habitat for the golden eagle is absent from the site, foraging habitat exists onsite. The nearest documented occurrence of the GE is more than three miles from the site.
Burrowing owl (BUOW) *Athene cunicularia*	CSC	Found in open, dry grasslands, deserts and ruderal areas. Requires suitable burrows. This species is often associated with California ground squirrels.	**Possible.** Suitable habitat is present onsite and adjacent to the site in the form of ground squirrel burrows. The nearest documented occurrence of BUOW is within a quarter mile from the site.
Short-eared owl *Asio flammeus*	CSC	Occur in wide open spaces including marshes, open shrublands, grassland, prairie, and agricultural field habitats, and need dense ground cover to conceal nests.	**Possible.** Suitable habitat for short-eared owls occurs on the site. However, they have not been recorded within three miles of the site.
Loggerhead shrike (LOSH) *Lanius ludovicianus*	CSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. Nests in tall shrubs and dense trees. Forages in grasslands, marshes, and ruderal habitats. Can often be found in cropland.	**Possible.** Suitable breeding and foraging habitat exist along the margins of the site in the form of shrubs.

Species	Status	Habitat	Occurrence in the Project Site
Yellow-breasted chat (YBC) *Icteria virens*	CSC	Frequently breeds in dense shrubs and blackberry thickets and uses areas of dense vegetation during migration.	**Unlikely.** Although dense vegetation suitable for nesting occurs nearly adjacent to the site, it is absent from the site, therefore, although this species may occur within the local vicinity, it is unlikely to occur onsite.
California yellow warbler *Dendroica petechia brewsteri*	CSC	Migrants move through many habitats of Sierra and its foothills. This species breeds in riparian thickets of alder, willow and cottonwoods.	**Unlikely.** Although dense vegetation suitable for nesting occurs nearly adjacent to the site, it is absent from the site, therefore, although this species may occur within the local vicinity, it is unlikely to occur onsite.
Grasshopper sparrow *Ammodramus savannarum*	CSC	Occurs in California during spring and summer in open grasslands with scattered shrubs.	**Possible.** Suitable breeding habitat is marginal onsite. The nearest documented occurrence is more than three miles from the site.
Townsend's big-eared bat *Corynorhinus townsendii*	CSC	Primarily a cave-dwelling bat that may also roost in buildings. Occurs in a variety of habitats.	**Possible.** Although suitable foraging habitat occurs onsite, suitable roosting habitat is absent from the site.
Pallid bat *Antrozous pallidus*	CSC	Grasslands, chaparral, woodlands, and forests; most common in dry rocky open areas providing roosting opportunities.	**Possible.** Although suitable foraging habitat occurs onsite, suitable roosting habitat is absent from the site.
Western red bat *Lasiurus blossevillii*	CSC	Roosts in tree or shrub foliage, although will occasionally use caves.	**Possible.** Trees with foliage thick enough for roosting western red bats is absent from the site, however, this species may be expected to forage over the site.
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	CSC	Found in hardwood forests, oak riparian and shrub habitats.	**Absent.** Woodrat nests were not observed during the 2021 survey.
American badger *Taxidea taxus*	CSC	Found in drier open stages of most shrub, forest and herbaceous habitats with friable soils, specifically grassland environments. Natal dens occur on slopes.	**Possible.** Suitable habitat for badgers occurs on the site and in the vicinity of the site. The nearest recorded observation of this species is adjacent to the site.

*Explanation of Occurrence Designations and Status Codes
Present: Species observed on the site at time of field surveys or during recent past.
Likely: Species not observed on the site, but it may reasonably be expected to occur there on a regular basis.
Possible: Species not observed on the site, but it could occur there from time to time.
Unlikely: Species not observed on the site, and would not be expected to occur there except, perhaps, as a transient.
Absent: Species not observed on the site and precluded from occurring there because habitat requirements not met.

STATUS CODES

FE	Federally Endangered	CE	California Endangered
FT	Federally Threatened	CT	California Threatened
FPE	Federally Endangered (Proposed)	CR	California Rare
FC	Federal Candidate	CP	California Protected
CSC	California Species of Special Concern		
		CCE	California Candidate Endangered
CNPS	California Native Plant Society Listing		
1A	Plants Presumed Extinct in California	3	Plants about which we need more

1B	Plants Rare, Threatened, or Endangered in California and elsewhere
2	Plants Rare, Threatened, or Endangered in California, but more common elsewhere
	information – a review list
4	Plants of limited distribution – a watch list

2.4 JURISDICTIONAL WATERS

Jurisdictional waters include rivers, creeks, and drainages that have a defined bed and bank and which, at the very least, carry ephemeral flows. Jurisdictional waters also include lakes, ponds, reservoirs, and wetlands. Such waters may be subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE), CDFW, and the Regional Water Quality Control Board (RWQCB). See Section 3.2.5 of this report for additional information. A portion of Sand Creek and a tributary of Sand Creek exist in the western portion of the site. In addition to the channels, a fairly extensive wetland complex is present at the lower elevations of the eastern portion of the site in an area proposed for development, and there are also three potential wetlands occurring outside of the wetland complex. See Section 3.3.14 of this report for a more detailed discussion.

3 IMPACTS AND MITIGATIONS

3.1 SIGNIFICANCE CRITERIA

General plans, area plans, and specific projects are subject to the provisions of the California Environmental Quality Act. The purpose of CEQA is to assess the impacts of proposed projects on the environment before they are constructed. For example, site development may require the removal of some or all of its existing vegetation. Animals associated with this vegetation could be destroyed or displaced. Animals adapted to humans, roads, buildings, pets, etc., may replace those species formerly occurring on a site. Plants and animals that are state and/or federally listed as threatened or endangered may be destroyed or displaced. Sensitive habitats such as wetlands and riparian woodlands may be altered or destroyed. These impacts may be considered significant. According to *2019 CEQA Status and Guidelines* (2019), "Significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest. Specific project impacts to biological resources may be considered "significant" if they will:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

3.2 RELEVANT GOALS, POLICIES, AND LAWS

3.2.1 Threatened and Endangered Species

State and federal "endangered species" legislation has provided the CDFW and USFWS with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Species listed as threatened or endangered under provisions of the state and federal Endangered Species Acts, candidate species for such listing, state species of special concern, and some plants listed as endangered by the California Native Plant Society are collectively referred to as "species of special status." Permits may be required from both the CDFW and USFWS if activities associated with a proposed project will result in the take of a listed species. To "take" a listed species, as defined by the state of California, is "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill" said species (California Fish and Game Code, Section 86). "Take" is more broadly defined by the federal Endangered Species Act to include "harm" of a listed species (16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, the CDFW and the USFWS are responding agencies under CEQA. Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

3.2.2 Migratory Birds

State and federal laws also protect most bird species. The State of California signed Assembly Bill 454 into law in 2019, which clarifies native bird protection and increases protections where California law previously deferred to Federal law. The Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., scc. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

3.2.3 Birds of Prey

Birds of prey are protected in California under provisions of the State Fish and Game Code, Section 3503.5, which states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFW.

Additionally, the Bald and Golden Eagle Protection Act (16 U.S.C., scc. 668-668c) prohibits anyone from taking bald or golden eagles, including their parts, nests, or eggs, unless authorized under a federal permit. The act prohibits any disturbance that directly affects an eagle or an active eagle nest as well as any disturbance caused by humans around a previously used nest site during a time when eagles are not present such that it agitates or bothers an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

3.2.4 Bats

Section 2000 and 4150 of the California Fish and Game Code states that it is unlawful to take or possess a number of species, including bats, without a license or permit, as required by Section 3007. Additionally, Title 14 of the California Code of Regulations states it is unlawful to harass, herd, or drive a number of species, including bats. To harass is defined as "an intentional act which disrupts an animal's normal behavior patterns, which includes, but is not limited to, breeding, feeding or sheltering." For these reasons, bat colonies in particular are considered to be sensitive and therefore, disturbances that cause harm to bat colonies are unlawful.

3.2.5 Wetlands and Other "Jurisdictional Waters"

Jurisdictional waters include waters of the United States subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE) and waters of the State of California subject to the regulatory authority of the California Department of Fish and Wildlife (CDFW) and the California Regional Water Quality Control Board (RWQCB).

Clean Water Act, Section 404. The USACE regulates the filling or grading of Waters of the U.S. under the authority of Section 404 of the Clean Water Act. Drainage channels and adjacent wetlands may be considered "waters of the United States" or "jurisdictional waters" subject to the jurisdiction of the USACE. The extent of jurisdiction has been defined in the Code of Federal Regulations and clarified in federal courts.

The definition of waters of the U.S. have changed several times in recent years. In January 2020, the Environmental Protection Agency (EPA) and USACE jointly issued the Navigable Waters Protection Rule. The new rule was published in the Federal Register on April 21, 2020, and took effect on June 22, 2020.

The Navigable Waters Protection Rule (33 CFR §328.3(a)) defines waters of the U.S. as:

Territorial Seas and Traditional Navigable Waters (TNWs)

- The territorial seas and traditional navigable waters include large rivers and lakes and tidally influenced waterbodies used in interstate or foreign commerce.

Tributaries

- Tributaries include perennial and intermittent rivers and streams that contribute surface flow to traditional navigable waters in a typical year. These naturally occurring surface water channels must flow more often than just after a single precipitation event—that is, tributaries must be perennial or intermittent.

- Tributaries can connect to a traditional navigable water or territorial sea in a typical year either directly or through other "waters of the United States," through channelized non-jurisdictional surface waters, through artificial features (including culverts and spillways), or through natural features (including debris piles and boulder fields).

- Ditches are to be considered tributaries only where they satisfy the flow conditions of the perennial and intermittent tributary definition and either were constructed in or relocate a tributary or were constructed in an adjacent wetland and contribute perennial or intermittent flow to a traditional navigable water in a typical year.

Lakes, Ponds, and Impoundments of Jurisdictional Waters

- Lakes, ponds, and impoundments of jurisdictional waters are jurisdictional where they contribute surface water flow to a traditional navigable water or territorial sea in a typical year either directly or through other waters of the United States, through channelized non-jurisdictional surface waters, through artificial features (including culverts and spillways), or through natural features (including debris piles and boulder fields).

- Lakes, ponds, and impoundments of jurisdictional waters are also jurisdictional where they are flooded by a water of the United States in a typical year, such as certain oxbow lakes that lie along the Mississippi River.

Adjacent Wetlands

- Wetlands that physically touch other jurisdictional waters are "adjacent wetlands."

- Wetlands separated from a water of the United States by only a natural berm, bank or dune are also "adjacent."

- Wetlands inundated by flooding from a water of the United States in a typical year are "adjacent."

- Wetlands that are physically separated from a jurisdictional water by an artificial dike, barrier, or similar artificial structure are "adjacent" so long as that structure allows for a direct hydrologic surface connection between the wetlands and the jurisdictional water in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature.

- An adjacent wetland is jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

The Navigable Waters Protection Rule also outlines what do not constitute waters of the United States. The following waters/features are not jurisdictional under the rule:

- Waterbodies that are not included in the four categories of waters of the United States listed above.

- Groundwater, including groundwater drained through subsurface drainage systems, such as drains in agricultural lands.

- Ephemeral features, including ephemeral streams, swales, gullies, rills, and pools.

- Diffuse stormwater run-off and directional sheet flow over upland.

- Many farm and roadside ditches.

- Prior converted cropland retains its longstanding exclusion, but is defined for the first time in the final rule. The agencies are clarifying that this exclusion will cease to apply when cropland is abandoned (i.e., not used for, or in support of, agricultural purposes in the immediately preceding five years) and has reverted to wetlands.

- Artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease.

- Artificial lakes and ponds, including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters.

- Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel.

- Stormwater control features excavated or constructed in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater run-off.

- Groundwater recharge, water reuse, and wastewater recycling structures, including detention, retention and infiltration basins and ponds, that are constructed in upland or in non-jurisdictional waters.

- Waste treatment systems have been excluded from the definition of waters of the United States since 1979 and will continue to be excluded under the final rule. Waste treatment systems include all components, including lagoons and treatment ponds (such as settling or cooling ponds), designed to either convey or retain, concentrate, settle, reduce, or remove pollutants, either actively or passively, from wastewater or stormwater prior to discharge (or eliminating any such discharge).

All activities that involve the discharge of dredge or fill material into waters of the U.S. are subject to the permit requirements of the USACE under Section 404 of the Clean Water Act. Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued without a CWA Section 401 Water Quality Certification (or waiver of such certification) verifying that the proposed activity will meet state water quality standards (Section 3.6.2).

Porter-Cologne Water Quality Act/Clean Water Act, Section 401. There are nine Regional Water Quality Control Boards statewide; collectively, they oversee regional and local water quality in

California. The RWQCB administers Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. The RWQCB for a given region regulates discharges of fill or pollutants into waters of the State through the issuance of various permits and orders.

Pursuant to Section 401 of the Clean Water Act, the RWQCB regulates waters of the State that are also waters of the U.S. Discharges into such waters require a Section 401 Water Quality Certification from the RWQCB as a condition to obtaining certain federal permits, such as a Clean Water Act Section 404 permit (Section 3.6.1). Discharges into all Waters of the State, even those that are not also Waters of the U.S., require Waste Discharge Requirements (WDRs), or a waiver of WDRs, from the RWQCB.

The Porter-Cologne Water Quality Control Act, Water Code Section 13260, requires that "any person discharging waste, or proposing to discharge waste, within any region that could affect the 'waters of the State' to file a report of discharge" with the RWQCB. Waters of the State as defined in the Porter-Cologne Act (Water Code Section 13050[e]) are "any surface water or groundwater, including saline waters, within the boundaries of the state." This gives the RWQCB authority to regulate a broader set of waters than the Clean Water Act alone; specifically, in addition to regulating waters of the U.S. through the Section 401 Water Quality Certification process, the RWQCB also claims jurisdiction and exercises discretionary authority over "isolated waters," or waters that are not themselves waters of the U.S. and are not hydrologically connected to waters of the U.S.

The RWQCB also administers the Construction Stormwater Program and the federal National Pollution Discharge Elimination System (NPDES) program. Projects that disturb one or more acres of soil must obtain a Construction General Permit under the Construction Stormwater Program. A prerequisite for this permit is the development of a Stormwater Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Projects that discharge wastewater, stormwater, or other pollutants into a Water of the U.S. may require a NPDES permit.

California Department of Fish and Game Code, Section 1602. The CDFW has jurisdiction over the bed and bank of natural drainages and lakes according to provisions of Section 1602 of the

California Fish and Game Code. Activities that may substantially modify such waters through the diversion or obstruction of their natural flow, change or use of any material from their bed or bank, or the deposition of debris require a Notification of Lake or Streambed Alteration. If the CDFW determines that the activity may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. Such an agreement typically stipulates that certain measures will be implemented to protect the habitat values of the lake or drainage in question.

3.2.6 City of Antioch Tree Preservation Ordinance

The City of Antioch has a tree ordinance (Chapter 5, Article 12, Section 9-5.12.05 of the City's Zoning Ordinance "Tree Preservation and Regulation"), which stipulates that tree removal is evaluated as part of the development application process for proposed projects. The ordinance breaks down trees that are proposed for removal into six different categories for purposes of determining the appropriate number of replacement trees that will be required:

- An "established" tree is any tree that is at least ten inches in diameter at breast height (DBH), measured 4.5 feet above natural or finished grade.
- An "indigenous tree" is a naturally growing tree of the following species: Blue Oak *(Quercus douglasii*), Valley Oak (*Quercus lobata*), Coast Live Oak (*Quercus agrifolia*), Canyon Live Oak (*Quercus chrysolepis*), Interior Live Oak (*Quercus wislizenii*), California Buckeye (*Aesculus californica*), and California Bay (*Umbellularia californica*).
- A "landmark tree" is any tree that is at least 48 inches in DBH and/or is over 40 feet in height. • A mature tree is any tree that is at least 26 inches in DBH.
- A street tree is any tree planted within a public right-of-way and/or a tree planting easement.
- A "protected tree" is any tree required to be preserved as a condition of an approval from a regular development application.

The tree ordinance requires that any tree approved for removal will be replaced. Requirements for replacement trees includes two 24-inch box trees for each "established" tree, two 48-inch box trees for each "mature" tree, and the City Council has discretion in determining the appropriate ratio of box tree replacements for any "landmark" or "indigenous" trees.

Several trees occur on the site that would be considered "established" and/or "indigenous" trees including blue and valley oaks.

3.3 IMPACTS SPECIFIC TO THE PROJECT

Based on the Vesting Tentative Map for the Albers Property (CBG Engineers 2021) the majority of the site would be developed into a 288 single-family home subdivision, roads and assisted living development in the western portion of the site near Deer Valley Road. The remainder of the site would include approximately 40 acres of open space, approximately seven acres of water quality facilities including detention basins, and a 1.5-acre park. As discussed above, activities resulting in impacts to biotic resources may be regulated by local, state, and federal laws. The natural resource issues specific to this project are discussed in detail below.

3.3.1 Potential Project Impacts to Special Status Plants

Potential Impact. Most special status plant species known to occur, or to once have occurred, in the project region are considered absent from the site due to the absence of suitable habitat for these species, including the absence of serpentine soils, marshes and swamps, and inland dunes; or because the species is a perennial shrub or herb that would have been observed if present during the May 2021 site survey. Several other special status plant species are considered unlikely to occur on the site because habitats of the site are extremely limited (such as grasslands occurring at the margins of the wheat fields) or extremely marginal (due to decades of agricultural disturbance, etc.) for these species, and/or the species may not be known to occur in the project vicinity (i.e., within a three-mile radius), and/or the species has not been observed in many decades in the project region.

Soils of the study area are alkaline, and grasslands occurring at the edges of the wheat fields on alkaline soils, and/or wetlands occurring on alkaline soils, may provide potential habitat for several special status plant species including Contra Costa goldfields (*Lasthenia conjugens*), alkali milk-vetch (*Astragalus tener* var. *tener*), heartscale (*Atriplex cordulata*), brittlescale (*Atriplex depressa*), lesser saltscale (*Atriplex minuscula*), dwarf downingia (*Downingia pusilla*), Jepson's coyote-thistle (*Eryngium jepsonii*), shining navarretia (*Navarretia nigelliformis* ssp. *radians*), bearded popcornflower (*Plagiobothrys hystriculus*), California alkali grass (*Puccinellia simplex*), and long-styled sand-spurrey (*Spergularia macrotheca var. longistyla*). Additionally, one other special status plant, San Joaquin spearscale (*Extriplex joaquinana*), has actually been observed on the site in two different locations in the past.

Focused floristic surveys during the appropriate blooming season in all potentially suitable habitats for these species would be necessary to determine whether the proposed project would impact any populations of these species. Should focused surveys determine populations of any of these species are present on the site, and if the project as proposed would impact these populations, this could be considered a potentially significant impact of the project.

3.3.2 Loss of Habitat for Special Status Animals

Potential Impact. Thirty-seven special status animal species occur, or once occurred, regionally (see Table 2). Of these, 21 species would be absent or unlikely to occur on the site due to a lack of suitable habitat for these species. The species that would be absent or unlikely to occur include the Lange's metalmark butterfly, Conservancy fairy shrimp, longhorn fairy shrimp, steelhead, longfin smelt, foothill yellow-legged frog, Sacramento perch, California glossy snake, northern California legless lizard, coast horned lizard, Alameda whipsnake, San Joaquin whipsnake, giant garter snake, American peregrine falcon, California least tern, bank swallow, yellow-breasted chat, California yellow warbler, tricolored blackbird, San Francisco dusky-footed woodrat, and San Joaquin kit fox.

The remaining 17 special status animal species from Table 2 potentially occur more frequently as potential foragers or transients, may be resident to the site, or may occur within areas adjacent to the site. These include vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, California red-legged frog, western pond turtle, Swainson's hawk, white-tailed kite, northern harrier, golden eagle, burrowing owl, short-eared owl, loggerhead shrike, grasshopper sparrow, Townsend's big-eared bat, pallid bat, western red bat, and American badger.

No evidence of bats was observed during reconnaissance surveys, and onsite trees do not support suitable roosting habitat for bats, therefore, these species are expected to only forage on the site and do not require preconstruction surveys or other mitigation measures.

The loss of agricultural habitat, which does not contain regionally important habitat for the above-mentioned listed species, will not result in a significant loss of habitat for the species listed in Table 2.

The project does have the potential to result in an impact to construction-related injury or mortality of nesting migratory birds and raptors, vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, California red-legged frog, western pond turtle, Swainson's hawk, white-tailed kite, northern harrier, golden eagle, burrowing owl, short-eared owl, loggerhead shrike, grasshopper sparrow, American badger, and San Joaquin kit fox as discussed below in Sections 3.3.5 through 3.3.13.

Mitigation. No mitigation warranted.

3.3.3 Loss of Habitat for Native Wildlife

Potential Impact. The habitats of the site comprise only a small portion of the regionally available habitat for plant and animal species that are expected to use the habitat. The proposed project would result in the loss of agricultural habitat. This is not expected to result in a significant loss of habitat for local wildlife. Therefore, impacts due to the loss of habitats for native wildlife resulting from the proposed project are considered less-than-significant.

Mitigation. No mitigation would be warranted for the loss of habitat for native wildlife.

3.3.4 Interference with the Movement of Native Wildlife

Potential Impact. The development of the site as currently planned would not constrain native wildlife movement. Most wildlife using the adjacent Sand Creek as a local movement corridor would likely continue to use it in the same manner after site development.

Mitigation. No mitigation warranted.

3.3.5 Potential Impacts to Nesting Migratory Birds Including Nesting Raptors and Protected Birds

Potential Impacts. Trees and ground on the project site and the riparian habitat adjacent to Sand Creek may support nesting birds and raptors. Buildout of the project during the nesting period for migratory birds (i.e., typically between February 1 to August 31), including initial site grading, soil excavation, and/or tree and vegetation removal, poses a risk of nest abandonment and death of any live eggs or young that may be present in nests within or near the site. Such an effect would be considered a significant impact. To ensure that any active nests will not be disturbed, and individual birds will not be harmed by construction activities, the following measures should be followed.

3.3.6 Potential Impacts to Listed Fairy Shrimp

Potential Impacts. The site has potential to support vernal pool fairy shrimp and vernal pool tadpole shrimp, as a seasonal wetland complex in the eastern portion of the site that is potentially capable of supporting vernal pool branchiopods. To ensure these species will not be disturbed, and individuals will not be harmed by construction activities, the following measures should be followed.

3.3.7 Potential Impacts to California Tiger Salamander

Potential Impacts. Sand Creek, a tributary of Sand Creek, and the seasonal wetlands on and adjacent to the site support potentially suitable breeding habitat. Impacts to individual CTS or to known breeding pools would be considered a significant impact. To ensure that CTS will not be harmed by construction activities, the following measures should be followed.

3.3.8 Potential Impacts to California Red-Legged Frogs

Potential Impacts. Potentially suitable upland habitat for the California red-legged frog (CRLF) is present within the project site in the form of riparian habitat associated with Sand Creek as well as the tributary of Sand Creek on the western side of the project site; currently impacts are not expected to occur within Sand Creek. CRLF may also be expected to move out of the riparian area onto the upland portion of the site from time to time as well. Injury or mortality of an individual CRLF would be considered a significant impact to CRLF under CEQA.

3.3.9 Potential Impacts to Western Pond Turtles

Potential Impacts. The proposed project would result in the loss of a small area of upland habitat for western pond turtles. Impacts to WPT habitat would be considered minimal. However, it is possible that WPT would move into the construction zone, which may result in mortality to individual western pond turtles. The loss of these individuals would constitute a significant impact under CEQA.

3.3.10 Potential Impacts to Swainson's Hawk

Potential Impacts. Trees along the margins of the site support potentially suitable nesting habitat and the remainder of the site supports foraging habitat for the SWHA. There have been 30 documented sightings within a ten-mile radius of the project site (Figure 4c) with the closest being within a quarter mile of the site. Therefore, as SWHA is known to nest and forage within the area, they have some potential to occur onsite which may result in mortality to individual SWHA. The loss of these individuals would constitute a significant impact under CEQA.

3.3.11 Potential Impacts to Golden Eagle

Potential Impacts. Although nesting habitat is absent from the site and golden eagles are not known to nest within three miles of the site, should, in the future, a golden eagle nest occur within a half-mile of the site and be within line of site from the site, particular construction activities has the small potential to impact an active nest. The project would not result in a significant loss of foraging habitat for the golden eagle. An impact to an active golden eagle nest would constitute a significant impact under CEQA.

3.3.12 Potential Impacts to Western Burrowing Owls

Potential Impacts. The site supports potentially suitable habitat for burrowing owls in the form of ground squirrel burrows. Should site demolition or grading occur during the nesting season for this species (February 1 through August 31), nests and nestlings that may be present would likely be destroyed. Overwintering burrowing owls may also be buried in their roost burrows outside of the nesting season (September 1 through January 31). Any actions related to site development that result in the mortality of burrowing owls would constitute a violation of the federal Migratory

Bird Treaty Act and provisions of the California Fish and Game Code and would constitute a significant impact under CEQA.

3.3.13 Potential Impacts to American Badgers

Potential Impacts. Suitable habitat for American badgers occurs on the site. Additionally, they have been observed adjacent to the site. The site may be used by badgers for movement, foraging, and breeding. No badgers or badger burrows were observed on the project site during the May 2021 survey; however, should badgers occur onsite at the time of construction, the project could result in mortality of individuals of this species, which would constitute a significant impact under CEQA.

3.3.14 Potential Impacts to San Joaquin Kit Fox

Potential Impacts. The site supports marginal habitat for the San Joaquin kit fox as it has been highly modified for agricultural use (e.g., dryland farmed) and the site sits on the western edge of development in this region of Antioch. While an extensive survey for burrows was not completed, no suitable burrows were detected nor would we expect to find any given site conditions and the fact that kit fox have not been observed in the region for more than 25 years. Therefore, the site supports only marginal foraging and dispersal habitat for the kit fox. Therefore, development of the site would result in a less than significant loss of foraging or dispersal habitat for the kit fox.

While unlikely that a kit fox would ever occur on site, if they did prior to construction, site development might harm or injury an individual kit fox. This would result in a significant impact to individual kit foxes.

3.3.15 Potential Impacts to Riparian Habitat and Other Sensitive Natural Communities, Including Federally and State Protected Wetlands

Potential Impacts. Jurisdictional waters of the U.S. and state under the jurisdiction of the U.S. Army Corps of Engineers (USACE), the Regional Water Quality Control Board (RWQCB) and the California Department of Fish and Wildlife (CDFW) are present on the site in the form of Sand Creek and its unnamed tributary, which occur in the northern and western portions of the site. The limits of USACE jurisdiction would be the Ordinary High Water mark on opposing banks and the limits of jurisdiction of the CDFW and RWQCB would be the top of the bank or the dripline of woody riparian vegetation, which is ever is greater. A small amount of mixed riparian woodland is present along the southern bank of both channels near the site's northern boundary as previously described in this report. As currently proposed, the project would avoid impacts to the channels and associated riparian habitat as they would be preserved within designated open space (Parcel Y). However, an emergency vehicle access (EVA) road is proposed from Deer Valley Road at the western boundary of the site that would traverse across an area between two segments of the unnamed channel. Depending on the design of the EVA road, its construction could result in temporary or minor permanent impacts to the channel. The project does not currently propose any storm drains into either channel. Should the construction of the EVA road or should the project be revised to include impacts such as storm drain outfalls into the channels on the site, these impacts may be considered significant and may also require permits from the regulatory agencies (see Regulatory Considerations in the section below). A formal wetland delineation would be required to be prepared and submitted to the USACE for a Jurisdictional Determination to determine the extent of the jurisdictional status of the channels.

In addition to the channels, a fairly extensive wetland complex is present at the lower elevations of the eastern portion of the site in an area proposed for development, and there are also three potential wetlands occurring outside of the wetland complex. These wetlands appear to be isolated from other waters of the U.S. and therefore may not be considered jurisdictional by the USACE, however, they likely would be considered jurisdictional by the RWQCB. Project impacts to these wetlands would be considered a significant impact of the project.

3.3.16 Degradation of Water Quality in Seasonal Drainages, Stock Ponds and Downstream Waters

Potential Impact. Eventual site development and construction may require grading that leaves the soil of construction zones barren of vegetation and, therefore, vulnerable to sheet, rill, or gully erosion. Eroded soil is generally carried as sediment in surface runoff to be deposited in natural creek beds, canals, and adjacent wetlands. Furthermore, urban runoff is often polluted with grease, oil, pesticide and herbicide residues, heavy metals, etc. These pollutants may eventually be carried to sensitive wetland habitats used by a diversity of native wildlife species. The deposition of pollutants and sediments in sensitive riparian and wetland habitats would be considered a potentially significant adverse environmental impact. The project would comply with the City of Antioch's grading requirements. Therefore, the project buildout would result in a less-than-significant impact to water quality.

Mitigation. No mitigation is warranted.

3.3.17 Conflict with Local Policies and Ordinances: City of Antioch Tree Ordinance

Potential Impacts. The City of Antioch has a tree ordinance. A tree inventory was not conducted by an arborist for this site; however, trees exist on the site which may require a permit from the city to remove. If any trees are planned to be removed, the loss of ordinance-sized trees without further compliance with the City's tree policies would constitute a significant adverse impact of the project.

3.3.18 Conflict with Habitat Conservation Plans

The proposed project is not within any HCP or NCCP.

3.4 MITIGATION MEASURES

3.4.1 Special-Status Plants

I: Prior to initiation of ground-disturbing activities on the project site and off-site improvement areas, the project applicant shall retain a qualified biologist to conduct focused botanical surveys for Contra Costa goldfields, alkali milk-vetch, heartscale, brittlescale, lesser saltscale, dwarf downingia, Jepson's coyote-thistle, shining navarretia, bearded popcornflower, California alkali grass, long-styled sand spurrey, San Joaquin spearscale, and all plants that are considered locally rare as listed in the East Bay Chapter of the CNPS Database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties for the Marsh Creek/Lone Tree Valley area. Focused botanical survey will be conducted consistent with the CNPS survey protocol (CNPS 1983, revised 2001, or the most current CNPS survey protocol) and the CDFW recommended protocols for botanical resource surveys (CDFW 2018, or the most recent CDFW protocol). These protocols include surveying areas providing potential habitat on foot in such a way as to provide 100% visual coverage of the area in all appropriate blooming seasons. Project construction shall not be initiated until all special-status plant surveys are completed and the mitigation is implemented, if necessary and required prior to starting construction. A special-status plant survey report that includes the methods used, survey participants, and associated findings shall be prepared and submitted to the City no more than 30 days following the completion of the final site visit. A record of any special-status plant species identified within the project site during the preconstruction surveys shall be submitted to the CNDDB. If new special-status plant populations are not found on the site during the appropriately timed surveys, additional mitigation is not required. If construction is not started within two years after the rare plant surveys are completed, the city may require additional rare plant surveys.

If special-status plants are observed on the site during the survey, the populations shall be avoided to the maximum degree possible during project development, and a Mitigation and Monitoring Plan (MMP) shall be prepared detailing the measures to be implemented to avoid any retained plant populations. The MMP shall include establishment of appropriate buffers during construction, fencing of the population prior to and during construction, and regular monitoring of the preserved population by a biologist during and after construction activities. The MMP shall be implemented prior to the initiation of project grading.

If plant populations cannot be fully avoided, the applicant shall hire a qualified biologist to prepare an on-site or off-site MMP in coordination with the City of Antioch to reduce impacts to the identified special-status plant populations to a less-than-significant level, subject to review and approval by the City of Antioch Community Development Department. At a minimum, the MMP will include:

- Location of suitable on-site or off-site areas to establish new populations.
- Means by which established populations will be conserved in-perpetuity.
- Methods of site preparation, seed/plant procurement, and plant establishment.

A monitoring plan that includes the length of monitoring (typically at least five years), monitoring interval (typically annually), interim and final success criteria, and an adaptive management plan to describe measures that will be taken in the case that interim or final success criteria goals are not met.

3.4.2 Nesting Migratory Birds Including Nesting Raptors and Protected Birds

II (a): If initial site disturbance activities, including tree, shrub, or vegetation removal, are to occur during the breeding season (typically February 1 to August 31), a qualified biologist would conduct pre-construction surveys for nesting migratory birds and raptors. The survey for nesting migratory birds would cover the project site itself, and the survey for nesting raptors would encompass the site and surrounding lands within 250 feet, where accessible. The survey should occur within 14 days prior to the onset of ground disturbance. If a nesting migratory bird were to be detected, an appropriate construction-free buffer would be established. Actual size of buffer, which would be determined by the project biologist, would depend on species, topography, and type of activity that would occur in the vicinity of the nest. The project buffer would be monitored periodically by the project biologist to ensure compliance. After the nesting is completed, as determined by the biologist, the buffer would no longer be required.

II(b): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if an active bird nest is observed.

3.4.3 Listed Fairy Shrimp

III(a): If avoidance of potential fairy shrimp habitat is not possible, one of two options will occur: 1) to conduct protocol-level surveys or 2) to assume presence in potential habitat.

> <u>Option 1:</u> Conduct protocol-level surveys for listed fairy shrimp to assess for presence or absence. These surveys will need to occur in a year wet enough to fill ephemeral wetlands for the USFWS to accept the results of the surveys. Should these surveys identify listed fairy shrimp, mitigation measure III (b) shall be followed; should these surveys confirm absence of listed fairy shrimp, no further action will be necessary.
>
> <u>Option 2:</u> Assume presence of listed fairy shrimp in potential habitat onsite.

III(b): If avoidance of potential fairy shrimp habitat is not possible or if listed fairy shrimp have been observed within wetlands onsite, mitigation for the loss of fairy shrimp habitat should be a combination of preserving occupied and potentially occupied habitat at a minimum of 2:1 ratio (preserved:impacted) and creating additional habitat at a minimum of 2:1 ratio (created:impacted). Preservation or created habitat shall be via the purchase of mitigation land in fee title or via recordation of a conservation easement to be preserved in perpetuity. Preservation and creation of suitable habitat shall include the development of a Habitat Mitigation and Management Plan (HMMP) which will outline the requirements for managing preserved areas and created areas as well as success criteria for the created habitat. Fairy shrimp habitat shall be established at least a year prior to onsite impacts to fairy shrimp habitat in order to monitor the new habitat's effectiveness, including a comparison to the existing onsite habitat with regards to appropriate hydrology for fairy shrimp.

Once it has been determined the created habitat supports the appropriate hydrology, the top four inches of topsoil of the onsite habitat planned to be impacted and transferred to the mitigation site in the same day. Removal and placement of this topsoil shall be done in a systematic fashion that will avoid compaction of the soil.

III(c): The HMMP will provide methodology for monitoring the both the preserved and created fairy shrimp habitat for five years and will also provide success criteria. The HMMP will follow the guidelines for mitigation and monitoring of vernal pools issued by the USFWS (1994).

III(d): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a listed fairy shrimp is observed.

***IV(e): Regulatory issues*.** If breeding habitat is planned to be removed, in addition to evaluating the potential of the project to affect listed fairy shrimp under CEQA, the applicant would need to comply with provisions of the federal Endangered Species Act and would need to seek take authorization from the USFWS for project-related losses as required by law. To obtain a take permit, consultation with the U.S. Fish and Wildlife Service would need to be initiated either through a federal nexus (i.e., Section 7 consultation, usually through the USACE or the Bureau of Land Management) or through the HCP process (i.e., Section 10 consultation).

III(f): As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written “Conditions of Coverage” by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or
2. Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the city, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.

3.4.4 California Tiger Salamander

IV(a): During the rainy season, the seasonal wetlands in the eastern portion of the site shall be assessed to determine whether they could be classified as breeding habitat for the CTS. All other potential breeding areas (Sand Creek and the tributary of Sand Creek) are not being impacted.

IV(b): If all potential CTS breeding areas cannot be avoided will be avoided, compensation for loss of breeding habitat at a ratio of 3:1 and compensation for loss of upland habitat at a minimum ratio of 2:1 will be required. Preservation or created habitat shall be via the purchase of mitigation land in fee title, via recordation of a conservation easement to be preserved in perpetuity, or by purchasing credits at a mitigation bank.

IV(c): Pre-construction surveys should be conducted to ensure that CTS are absent from the construction area. If CTS are present, they should be relocated by a qualified biologist.

IV(d): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a California tiger salamander is observed.

***IV(e): Regulatory issues*.** If breeding habitat is planned to be removed, in addition to evaluating the potential of the project to affect the CTS under CEQA, the applicant would need to comply with provisions of the federal Endangered Species Act and would need to seek take authorization from the USFWS for project-related losses as required by law. To obtain a take permit, consultation with the U.S. Fish and Wildlife Service would need to be initiated either through a federal nexus (i.e., Section 7 consultation, usually through the USACE or the Bureau of Land Management) or through the HCP process (i.e., Section 10 consultation).

IV(f): As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written “Conditions of Coverage” by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or
2. Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.

3.4.5 California Red-Legged Frog

V(a): Prior to the start of construction, an approved qualified biologist should train all construction personnel regarding habitat sensitivity, identification of special status species, and required practices.

V(b): Pre-construction surveys should be conducted to ensure that CRLF are absent from the construction area. If CRLF are present, they should be relocated by a qualified biologist.

V(c): The construction zone should be cleared, and silt fencing should be erected and maintained around construction zones to prevent CRLF from moving into these areas.

V(d): A biological monitor should be present onsite during particular times of construction to ensure no CRLF are harmed, injured, or killed during project buildout.

V(e): Upland habitats should be managed via a long-term management plan to maintain the quality of the habitat for the movement and dispersal of CRLF. Potential opportunities include enhancement of the channels and riparian corridor (e.g., formation of plunge pools) would also maximize opportunities for CRLF to disperse from the ponds to even higher-quality habitat off-site.

V(f): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a California red-legged frog is observed.

***V(g): Regulatory issues*.** At this time breeding habitat is not planned to be impacted, however, if at a later time, breeding habitat is planned to be removed, in addition to evaluating the potential of the project to affect the CRLF under CEQA, the applicant would need to comply with provisions of the federal Endangered Species Act and would need to seek take authorization from the USFWS for project-related losses as required by law. To obtain a take permit, consultation with the U.S. Fish and Wildlife Service would need to be initiated either through a federal nexus (i.e., Section 7 consultation, usually through the USACE or the Bureau of Land Management) or through the HCP process (i.e., Section 10 consultation).

V(h): As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or
2. Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.

3.4.6 Western Pond Turtle

VI(a): Implementation of the measures for the CRLF (see mitigation measure V above) would adequately address impacts to western pond turtles. Should a western pond turtle be observed onsite, it shall be allowed to leave the site on its own or be relocated by a CDFW-approved biologist. Should a western pond turtle nest site be observed, a 50-foot construction-free buffer shall be established and maintained until a qualified biologist determines the nest is no longer active.

VI(b): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a western pond turtle is observed.

3.4.7 Swainson's Hawk

VII(a): During the nesting season prior to the construction on the project site within a half-mile of a potential nest tree, preconstruction surveys shall be conducted within the construction zones and adjacent lands to identify any nesting pairs of Swainson's hawks. These surveys will conform to the guidelines of CDFW as presented in *RECOMMENDED TIMING AND METHODOLOGY FOR SWAINSON'S HAWK NESTING SURVEYS IN CALIFORNIA'S CENTRAL VALLEY,* Swainson's Hawk Technical Advisory Committee, May 31, 2000. No preconstruction surveys are required for construction activity located farther than a half-mile from a potential nest tree.

VII(b): Should any active nests be discovered in or near proposed construction zones, the qualified biologist shall establish a suitable construction-free buffer around the nest. This buffer shall be identified on the ground with flagging or fencing and shall be maintained until the biologist has determined that the young have fledged.

VII(c): All workers on the construction of the Project Site shall attend tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a Swainson's hawk is observed on or near the construction zone.

VII(d): As an alternative to completion of this mitigation measure, the project applicant could comply with one of the following conditions:

1. Comply with the applicable terms and conditions of the ECCC HCP/NCCP, as determined in written "Conditions of Coverage" by the Conservancy, provided that the City has first entered into an agreement with the Conservancy for coverage of impacts to ECCC HCP/NCCP Covered Species; or
2. Comply with a habitat conservation plan and/or natural community conservation plan developed and adopted by the City, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.

3.4.8 Golden Eagle

VIII(a): Preconstruction surveys for golden eagle nests would be conducted concurrently with preconstruction surveys for Swainson's hawk nests. Should an active golden eagle nest be observed within a half-mile of the site and be within the line of site from the site, biological monitors would monitor the nest in order to establish baseline behavioral data. Based on the baseline behavioral data and location in the nest (i.e., whether the nest is remote or in/close to town and whether it has existing disturbances), a construction-free buffer shall be established. The construction-free buffer will be a minimum of 800 feet and can be increased based on the biological monitor's observations of the behavior at the nest.

VIII(b): All workers on the construction of the Project Site shall attend tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a golden eagle is observed on or near the construction zone.

3.4.9 Western Burrowing Owl

IX(a): Preconstruction surveys are required to ascertain whether or not burrowing owls occupy burrows on or adjacent to the site. Preconstruction surveys will be conducted in accordance with the CDFW's *Staff Report on Burrowing Owl Mitigation* (2012). These surveys consist of a minimum of two surveys, with the first survey being no more than 14 days prior to initial construction activities (i.e., vegetation removal, grading, excavation, etc.) and the second survey conducted no more than 24 hours prior to initial construction activities. Surveys will ensure 100% visual coverage. If no burrowing owls or fresh sign of burrowing owls are observed during preconstruction surveys, construction may proceed. If burrowing owls or their recent sign are observed during these surveys, occupied burrows will be identified by the monitoring biologist and a 250-foot buffer will be established and maintained until a qualified biologist has determined the burrowing owl has abandoned the burrow.

IX(b): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a western burrowing owl is observed.

3.4.10 American Badger

X(a): During the course of the preconstruction surveys for other species, a qualified biologist shall also determine the presence or absence of badgers prior to the start of construction. If badgers are found to be absent, no other mitigations for the protection of badgers shall be warranted.

X(b): If an active badger den is identified during pre-construction surveys within or immediately adjacent to an area subject to construction, a construction-free buffer of up to 300 feet shall be established around the den. Once the biologist has determined that badger has vacated the burrow, the burrow can be collapsed or excavated, and ground disturbance can proceed. Should the burrow be determined to be a natal or reproductive den, and because badgers are known to use multiple burrows in a breeding burrow complex, a biological monitor shall be present onsite during construction activities in the vicinity of the burrows to ensure the buffer is adequate to avoid direct impact to individuals or natal/reproductive den abandonment. The monitor will be required to be present until it is determined that young are of an independent age and construction activities would not harm individual badgers.

X(c): All workers on the project site shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if an American badger is observed.

3.4.11 San Joaquin Kit Fox

XI(a): During the course of the preconstruction surveys for other species, a qualified biologist shall also determine the presence or absence of kit fox prior to the start of construction. If badgers are found to be absent, no other mitigations for the protection of badgers shall be warranted.

XI(b): If an active kit fox den is identified during pre-construction surveys within or immediately adjacent to an area subject to construction, a construction-free buffer of up to 300 feet shall be established around the den. Once the biologist has determined that kit fox has vacated the burrow, the burrow can be collapsed or excavated, and ground disturbance can proceed. Should the burrow be determined to be a natal or reproductive den, a biological monitor shall be present onsite during construction activities in the vicinity of the burrows to ensure the buffer is adequate to avoid direct impact to individuals or natal/reproductive den abandonment. The monitor will be required to be present until it is determined that young are of an independent age and construction activities would not harm individual kit fox.

XI(c): All workers on the project shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a kit fox is observed.

3.4.12 Riparian Habitat and Other Sensitive Natural Communities, Including Federally and State Protected Wetlands

XII: Prior to the initiation of ground-disturbing activities, a formal wetland delineation will be conducted on the site and submitted to the USACE for verification to determine the extent of all hydrological features, their jurisdictional status, and the extent of any impacts of the currently proposed project. A summary of the wetland delineation shall be submitted to the City of Antioch Community Development Department.

IV-13(b). Prior to discharging any dredged or fill materials into any waters of the U.S. within the project site and/or the off-site improvement areas, the applicant shall obtain permit authorization to fill wetlands under Section 404 of the federal Clean Water Act (CWA) (Section 404 Permit) from USACE. The Section 404 Permit application shall include an assessment of directly impacted, avoided, and preserved acreages to waters of the U.S. Mitigation measures shall be developed as part of the Section 404 Permit to ensure no net loss of wetland function and values. Mitigation for direct impacts to waters of the U.S. within the project site and/or the off-site improvement areas would occur at a minimum of 1:1 ratio for direct impacts by purchasing seasonal wetland credits from the Cosumnes Mitigation Bank or other wetland mitigation bank that services the project site, and is approved by the USACE and the RWQCB.

Alternatively, the project applicant may create, preserve, and manage new seasonal wetlands on or off of the project site that is of equal or greater quality to the habitats being impacted at a minimum 1:1 mitigation ratio. A project-specific Wetland Mitigation and Monitoring Plan prepared by a qualified wetland restoration ecologist that includes the following information shall be provided to the City of Antioch Community Development Department prior to conducting any activity that would result in the placement of any fill material into a water of the U.S. or water of the State:

A description of the impacted water;

- A map depicting the location of the mitigation site(s) and a description of existing site conditions;
- A detailed description of the mitigation design that includes: (i) the location of the created wetlands; (ii) proposed construction schedule; (iii) a planting/vegetation plan; (iv) specific monitoring metrics, and objective performance and success criteria, such as delineation of created area as jurisdictional waters using USACE published methods; and (v) contingency measures if the created wetlands do not achieve the specified success criteria; and
- Short-term and long-term management and monitoring methods.

If the wetland mitigation site is a separate mitigation property, the project applicant will grant a conservation easement to a qualified entity, as defined by Section 81.5.3 of the California Civil Code, preserving the created seasonal wetland(s) in perpetuity, and establish an endowment fund to provide for the long-term management, maintenance, and monitoring of the created seasonal wetland(s). If the proposed project includes placing fill material into jurisdictional waters of the

U.S. or waters of the State, the project applicant shall provide the City of Antioch Community Development Department with a copy of permits issued by the USACE and RWQCB authorizing the fill.

In addition, a Water Quality Certification or waiver pursuant to Section 401 of the CWA must be obtained for Section 404 permit actions. Proof of compliance with the mitigation measure shall be submitted to the City of Antioch Community Development Department prior to the issuance of grading permits.

IV-13(c). Impacts to riparian habitat within CDFW's Section 1602 jurisdictional areas that would occur during construction shall be mitigated through planting California native trees and/or shrubs within the Sand Creek buffer area. Impacted trees and shrubs shall be mitigated with a 3:1 (replacement:impacts) ratio. Replacement trees and shrubs shall be a minimum of one gallon size trees/shrub replacements.

In addition, the project applicant will implement appropriate BMPs to prevent construction related impacts that could result in discharge of eroded soils or pollutants into Sand Creek and the creek's tributaries. The measures shall include the installation of wildlife-friendly hay wattles and/or silt fence that will prevent unintended impacts during construction activities associated with Sand Creek. In addition, orange silt fencing shall be installed at the top-of-bank of Sand Creek to prevent unintended human and equipment traffic adjacent to Sand Creek. Finally, the dripline of all retained trees within the drainages on the project site, if near work areas, shall be protected through the installation of orange construction fencing.

The project applicant shall satisfy this mitigation by providing the City of Antioch Community Development Department with a fully executed copy of a CDFW Section 1600 Streambed Alteration Agreement (SAA) that includes these, or other functionally equivalent, BMPs, prior to any construction activities associated with Sand Creek. In addition to the mitigation requirements outlined here, the project applicant shall implement any additional conditions contained in the SAA.

3.4.13 Trees

XII: As ordinance-sized trees may occur onsite, mitigation for removal of any ordinance-sized trees shall follow the City's tree ordinance requirements which may require planting of replacement trees or fees.

4 LITERATURE CITED

Beier, P. and S. Loe. 1992. A Checklist for Evaluating Impacts to Wildlife Movement Corridors. Wildlife Society Bulletin 20(4):434-440.

California Department of Fish and Game. 2002. California Fish and Game code. Gould Publications. Binghamton, N.Y.

California Department of Fish and Wildlife. 2023. Annual Report on the Status of California State Listed Threatened and Endangered Animals and Plants. The Resources Agency, Sacramento, CA.

California Department of Fish and Wildlife. 2023. California Natural Diversity Database, Rarefind5. The Resources Agency, Sacramento, CA.

California Native Plant Society (CNPS). 2023. Inventory of Rare and Endangered Plants (online edition, v6-05c). California Native Plant Society. Sacramento, CA. http://www.cnps.org/inventory.

CBG Civil Engineers. 2021. Albers Property Vesting Tentative Map.

City of Antioch Municipal Code.

Harris, L.D., Gallagher, P.B., 1989. New initiatives for wildlife conservation: the need for movement corridors. In: Mackintosh, G. (Ed.), Preserving Communities and Corridors. Defenders of Wildlife, Washington DC, pp. 11–34.

Holland, R.F. 1986. Preliminary Description of the Terrestrial Natural Communities of California. Resources Agency, Sacramento, CA. 156 pp.

Mayer, K. E., and W. F. Laudenslayer, Jr. Ed. 1988. A guide to wildlife habitats of California. California Department of Forestry and Fire Protection. Sacramento, CA. 166 pp.

Moyle, P.B., R. M. Quiñones, J. V. Katz and J. Weaver. 2015. Fish Species of Special Concern in California. Sacramento: California Department of Fish and Wildlife. www.wildlife.ca.gov

Natural Resource Conservation Service. 2021. Web Soil Survey. USDA.

Remy, M. H., T. A. Thomas, J. G. Moose, and W. F. Manley. 1996. Guide to the California Environmental Quality Act.

Shuford, W. David and Thomas Gardall eds. 2008. California Bird Species of Special Concern. Western Field Orinthologists and California Department of Fish and Game.

Thomson, Robert C., Amber N. Wright, and H. Bradley Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. California Department of Wildlife. University of California Press.

USACE. 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army.

U.S. Fish and Wildlife Service. 2023. Endangered and threatened wildlife and plants.

Wetland Training Institute, Inc. 1990. Federal Wetland Regulation Reference Manual. B.N. Goode and R.J. Pierce (eds.) WTI 90-1. 281pp.

Appendix E

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch Project

Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Congregate Care (Assisted Living)	150.00	Dwelling Unit	9.38	150,000.00	429
Single Family Housing	300.00	Dwelling Unit	37.10	540,000.00	858
Regional Shopping Center	40.00	1000sqft	0.92	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site plan.

Construction Phase - Grading phase updating per project-specific info, and architectural coating phase set to occur concurrently with building construction.

Grading - Material export updated.

Vehicle Trips - Trip rates updated to match project-specific traffic report.

Mobile Land Use Mitigation - Project would improve pedestrian network.

Area Mitigation - Only natural gas hearths installed.

Water Mitigation - Water conservation strategy applied, per AQ Questionnaire.

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	75.00	120.00
tblConstructionPhase	NumDays	55.00	740.00
tblConstructionPhase	PhaseEndDate	8/23/2024	10/25/2024
tblConstructionPhase	PhaseEndDate	9/10/2027	1/10/2025
tblConstructionPhase	PhaseEndDate	6/25/2027	11/12/2027
tblConstructionPhase	PhaseStartDate	6/26/2027	10/26/2024
tblConstructionPhase	PhaseStartDate	8/24/2024	1/11/2025
tblConstructionPhase	PhaseStartDate	9/11/2027	1/25/2025
tblGrading	MaterialExported	0.00	300,000.00
tblLandUse	LotAcreage	97.40	37.10
tblVehicleTrips	ST_TR	2.93	2.60
tblVehicleTrips	ST_TR	46.12	37.75
tblVehicleTrips	ST_TR	9.54	9.44
tblVehicleTrips	SU_TR	3.15	2.60
tblVehicleTrips	SU_TR	21.10	37.75
tblVehicleTrips	SU_TR	8.55	9.44

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.2995	5.1212	2.9213	0.0161	1.1955	0.1304	1.3259	0.4644	0.1207	0.5851	0.0000	1,536.950 2	1,536.950 2	0.1744	0.1749	1,593.422 8
2025	1.9459	2.1080	3.0793	7.3900e-003	0.3192	0.0778	0.3970	0.0860	0.0735	0.1595	0.0000	669.3034	669.3034	0.0811	0.0248	678.7124
2026	2.0710	2.1390	3.0900	7.4600e-003	0.3307	0.0787	0.4094	0.0891	0.0744	0.1635	0.0000	677.2395	677.2395	0.0806	0.0249	686.6764
2027	1.8595	1.8530	2.6599	6.4100e-003	0.2882	0.0683	0.3565	0.0776	0.0647	0.1423	0.0000	582.8731	582.8731	0.0695	0.0210	590.8786
Maximum	**2.0710**	**5.1212**	**3.0900**	**0.0161**	**1.1955**	**0.1304**	**1.3259**	**0.4644**	**0.1207**	**0.5851**	**0.0000**	**1,536.950 2**	**1,536.950 2**	**0.1744**	**0.1749**	**1,593.422 8**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.2995	5.1212	2.9213	0.0161	1.1955	0.1304	1.3259	0.4644	0.1207	0.5851	0.0000	1,536.9497	1,536.9497	0.1744	0.1749	1,593.4223
2025	1.9459	2.1080	3.0793	7.3900e-003	0.3192	0.0778	0.3970	0.0860	0.0735	0.1595	0.0000	669.3030	669.3030	0.0811	0.0248	678.7120
2026	2.0710	2.1390	3.0900	7.4600e-003	0.3307	0.0787	0.4094	0.0891	0.0744	0.1635	0.0000	677.2391	677.2391	0.0806	0.0249	686.6760
2027	1.8595	1.8530	2.6599	6.4100e-003	0.2882	0.0683	0.3565	0.0776	0.0647	0.1423	0.0000	582.8727	582.8727	0.0695	0.0210	590.8782
Maximum	**2.0710**	**5.1212**	**3.0900**	**0.0161**	**1.1955**	**0.1304**	**1.3259**	**0.4644**	**0.1207**	**0.5851**	**0.0000**	**1,536.9497**	**1,536.9497**	**0.1744**	**0.1749**	**1,593.4223**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-1-2024	6-30-2024	1.8334	1.8334
2	7-1-2024	9-30-2024	2.5366	2.5366
3	10-1-2024	12-31-2024	0.9632	0.9632
4	1-1-2025	3-31-2025	0.8863	0.8863
5	4-1-2025	6-30-2025	1.0481	1.0481
6	7-1-2025	9-30-2025	1.0596	1.0596
7	10-1-2025	12-31-2025	1.0674	1.0674
8	1-1-2026	3-31-2026	1.0413	1.0413

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

9	**4-1-2026**	**6-30-2026**	1.0454	1.0454
10	**7-1-2026**	**9-30-2026**	1.0569	1.0569
11	**10-1-2026**	**12-31-2026**	1.0645	1.0645
12	**1-1-2027**	**3-31-2027**	1.0387	1.0387
13	**4-1-2027**	**6-30-2027**	1.0430	1.0430
14	**7-1-2027**	**9-30-2027**	1.0544	1.0544
		Highest	2.5366	2.5366

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.5721	0.0852	6.3862	6.4200e-003		0.4574	0.4574		0.4574	0.4574	44.9718	17.6305	62.6023	0.0883	2.6300e-003	65.5922
Energy	0.0504	0.4306	0.1852	2.7500e-003		0.0348	0.0348		0.0348	0.0348	0.0000	807.9438	807.9438	0.0596	0.0152	813.9664
Mobile	1.6851	1.7977	15.4637	0.0318	3.7191	0.0231	3.7422	0.9937	0.0215	1.0152	0.0000	3,047.634 6	3,047.634 6	0.1972	0.1455	3,095.918 1
Waste						0.0000	0.0000		0.0000	0.0000	109.4609	0.0000	109.4609	6.4690	0.0000	271.1846
Water						0.0000	0.0000		0.0000	0.0000	10.2417	22.7357	32.9774	1.0556	0.0253	66.9019
Total	**7.3076**	**2.3135**	**22.0351**	**0.0410**	**3.7191**	**0.5153**	**4.2344**	**0.9937**	**0.5138**	**1.5074**	**164.6743**	**3,895.944 7**	**4,060.618 9**	**7.8696**	**0.1886**	**4,313.563 2**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.4610	0.0656	3.3501	3.5000e-004		0.0207	0.0207		0.0207	0.0207	0.0000	36.9182	36.9182	5.8300e-003	5.8000e-004	37.2358
Energy	0.0504	0.4306	0.1852	2.7500e-003		0.0348	0.0348		0.0348	0.0348	0.0000	807.9438	807.9438	0.0596	0.0152	813.9664
Mobile	1.6700	1.7715	15.2422	0.0312	3.6447	0.0227	3.6674	0.9738	0.0212	0.9949	0.0000	2,988.7908	2,988.7908	0.1949	0.1434	3,036.3895
Waste						0.0000	0.0000		0.0000	0.0000	109.4609	0.0000	109.4609	6.4690	0.0000	271.1846
Water						0.0000	0.0000		0.0000	0.0000	9.2175	20.4622	29.6797	0.9500	0.0228	60.2117
Total	**5.1814**	**2.2677**	**18.7774**	**0.0343**	**3.6447**	**0.0782**	**3.7229**	**0.9738**	**0.0767**	**1.0504**	**118.6783**	**3,854.1150**	**3,972.7933**	**7.6793**	**0.1819**	**4,218.9880**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**29.10**	**1.98**	**14.78**	**16.30**	**2.00**	**84.82**	**12.08**	**2.00**	**85.08**	**30.31**	**27.93**	**1.07**	**2.16**	**2.42**	**3.54**	**2.19**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/10/2024	5	30	
2	Grading	Grading	5/11/2024	10/25/2024	5	120	
3	Building Construction	Building Construction	1/11/2025	11/12/2027	5	740	

4	Paving	Paving	10/26/2024	1/10/2025	5	55	
5	Architectural Coating	Architectural Coating	1/25/2025	11/26/2027	5	740	

Acres of Grading (Site Preparation Phase): 45

Acres of Grading (Grading Phase): 360

Acres of Paving: 0

Residential Indoor: 1,397,250; Residential Outdoor: 465,750; Non-Residential Indoor: 60,000; Non-Residential Outdoor: 20,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	229.00	55.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2949	0.0000	0.2949	0.1515	0.0000	0.1515	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0399	0.4076	0.2750	5.7000e-004		0.0184	0.0184		0.0170	0.0170	0.0000	50.1856	50.1856	0.0162	0.0000	50.5914
Total	**0.0399**	**0.4076**	**0.2750**	**5.7000e-004**	**0.2949**	**0.0184**	**0.3133**	**0.1515**	**0.0170**	**0.1685**	**0.0000**	**50.1856**	**50.1856**	**0.0162**	**0.0000**	**50.5914**

3.2 Site Preparation - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	4.2000e-004	5.5900e-003	2.0000e-005	2.1300e-003	1.0000e-005	2.1400e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.6309	1.6309	4.0000e-005	4.0000e-005	1.6447
Total	**6.5000e-004**	**4.2000e-004**	**5.5900e-003**	**2.0000e-005**	**2.1300e-003**	**1.0000e-005**	**2.1400e-003**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**1.6309**	**1.6309**	**4.0000e-005**	**4.0000e-005**	**1.6447**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2949	0.0000	0.2949	0.1515	0.0000	0.1515	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0399	0.4076	0.2750	5.7000e-004		0.0184	0.0184		0.0170	0.0170	0.0000	50.1855	50.1855	0.0162	0.0000	50.5913
Total	**0.0399**	**0.4076**	**0.2750**	**5.7000e-004**	**0.2949**	**0.0184**	**0.3133**	**0.1515**	**0.0170**	**0.1685**	**0.0000**	**50.1855**	**50.1855**	**0.0162**	**0.0000**	**50.5913**

3.2 Site Preparation - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	4.2000e-004	5.5900e-003	2.0000e-005	2.1300e-003	1.0000e-005	2.1400e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.6309	1.6309	4.0000e-005	4.0000e-005	1.6447
Total	**6.5000e-004**	**4.2000e-004**	**5.5900e-003**	**2.0000e-005**	**2.1300e-003**	**1.0000e-005**	**2.1400e-003**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**1.6309**	**1.6309**	**4.0000e-005**	**4.0000e-005**	**1.6447**

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5692	0.0000	0.5692	0.2218	0.0000	0.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1931	1.9426	1.6634	3.7200e-003		0.0801	0.0801		0.0737	0.0737	0.0000	327.1171	327.1171	0.1058	0.0000	329.7621
Total	**0.1931**	**1.9426**	**1.6634**	**3.7200e-003**	**0.5692**	**0.0801**	**0.6493**	**0.2218**	**0.0737**	**0.2955**	**0.0000**	**327.1171**	**327.1171**	**0.1058**	**0.0000**	**329.7621**

3.3 Grading - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0390	2.5443	0.6014	0.0111	0.3171	0.0207	0.3379	0.0872	0.0199	0.1071	0.0000	1,101.5768	1,101.5768	0.0368	0.1746	1,154.5248
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	1.8800e-003	0.0249	8.0000e-005	9.4800e-003	5.0000e-005	9.5300e-003	2.5200e-003	4.0000e-005	2.5700e-003	0.0000	7.2483	7.2483	1.9000e-004	1.9000e-004	7.3098
Total	**0.0418**	**2.5461**	**0.6263**	**0.0112**	**0.3266**	**0.0208**	**0.3474**	**0.0898**	**0.0199**	**0.1097**	**0.0000**	**1,108.8251**	**1,108.8251**	**0.0370**	**0.1748**	**1,161.8346**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5692	0.0000	0.5692	0.2218	0.0000	0.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1931	1.9426	1.6634	3.7200e-003		0.0801	0.0801		0.0737	0.0737	0.0000	327.1168	327.1168	0.1058	0.0000	329.7617
Total	**0.1931**	**1.9426**	**1.6634**	**3.7200e-003**	**0.5692**	**0.0801**	**0.6493**	**0.2218**	**0.0737**	**0.2955**	**0.0000**	**327.1168**	**327.1168**	**0.1058**	**0.0000**	**329.7617**

3.3 Grading - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0390	2.5443	0.6014	0.0111	0.3171	0.0207	0.3379	0.0872	0.0199	0.1071	0.0000	1,101.5768	1,101.5768	0.0368	0.1746	1,154.5248
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	1.8800e-003	0.0249	8.0000e-005	9.4800e-003	5.0000e-005	9.5300e-003	2.5200e-003	4.0000e-005	2.5700e-003	0.0000	7.2483	7.2483	1.9000e-004	1.9000e-004	7.3098
Total	**0.0418**	**2.5461**	**0.6263**	**0.0112**	**0.3266**	**0.0208**	**0.3474**	**0.0898**	**0.0199**	**0.1097**	**0.0000**	**1,108.8251**	**1,108.8251**	**0.0370**	**0.1748**	**1,161.8346**

3.4 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1730	1.5774	2.0347	3.4100e-003		0.0667	0.0667		0.0628	0.0628	0.0000	293.3781	293.3781	0.0690	0.0000	295.1022
Total	**0.1730**	**1.5774**	**2.0347**	**3.4100e-003**		**0.0667**	**0.0667**		**0.0628**	**0.0628**	**0.0000**	**293.3781**	**293.3781**	**0.0690**	**0.0000**	**295.1022**

3.4 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0200e-003	0.3083	0.0931	1.3600e-003	0.0457	1.8200e-003	0.0475	0.0132	1.7400e-003	0.0150	0.0000	132.7934	132.7934	2.7700e-003	0.0196	138.7130
Worker	0.0653	0.0408	0.5635	1.8100e-003	0.2289	1.0800e-003	0.2300	0.0609	9.9000e-004	0.0619	0.0000	170.7961	170.7961	4.2500e-003	4.3000e-003	172.1838
Total	**0.0723**	**0.3491**	**0.6566**	**3.1700e-003**	**0.2746**	**2.9000e-003**	**0.2775**	**0.0741**	**2.7300e-003**	**0.0768**	**0.0000**	**303.5895**	**303.5895**	**7.0200e-003**	**0.0239**	**310.8967**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1730	1.5774	2.0347	3.4100e-003		0.0667	0.0667		0.0628	0.0628	0.0000	293.3778	293.3778	0.0690	0.0000	295.1019
Total	**0.1730**	**1.5774**	**2.0347**	**3.4100e-003**		**0.0667**	**0.0667**		**0.0628**	**0.0628**	**0.0000**	**293.3778**	**293.3778**	**0.0690**	**0.0000**	**295.1019**

3.4 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0200e-003	0.3083	0.0931	1.3600e-003	0.0457	1.8200e-003	0.0475	0.0132	1.7400e-003	0.0150	0.0000	132.7934	132.7934	2.7700e-003	0.0196	138.7130
Worker	0.0653	0.0408	0.5635	1.8100e-003	0.2289	1.0800e-003	0.2300	0.0609	9.9000e-004	0.0619	0.0000	170.7961	170.7961	4.2500e-003	4.3000e-003	172.1838
Total	**0.0723**	**0.3491**	**0.6566**	**3.1700e-003**	**0.2746**	**2.9000e-003**	**0.2775**	**0.0741**	**2.7300e-003**	**0.0768**	**0.0000**	**303.5895**	**303.5895**	**7.0200e-003**	**0.0239**	**310.8967**

3.4 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.4 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0800e-003	0.3162	0.0947	1.3800e-003	0.0471	1.8700e-003	0.0490	0.0136	1.7900e-003	0.0154	0.0000	134.4828	134.4828	2.8400e-003	0.0199	140.4751
Worker	0.0637	0.0384	0.5498	1.8100e-003	0.2361	1.0600e-003	0.2372	0.0628	9.7000e-004	0.0638	0.0000	172.1929	172.1929	4.0100e-003	4.1900e-003	173.5423
Total	**0.0708**	**0.3546**	**0.6445**	**3.1900e-003**	**0.2832**	**2.9300e-003**	**0.2862**	**0.0764**	**2.7600e-003**	**0.0792**	**0.0000**	**306.6757**	**306.6757**	**6.8500e-003**	**0.0241**	**314.0175**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

3.4 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0800e-003	0.3162	0.0947	1.3800e-003	0.0471	1.8700e-003	0.0490	0.0136	1.7900e-003	0.0154	0.0000	134.4828	134.4828	2.8400e-003	0.0199	140.4751
Worker	0.0637	0.0384	0.5498	1.8100e-003	0.2361	1.0600e-003	0.2372	0.0628	9.7000e-004	0.0638	0.0000	172.1929	172.1929	4.0100e-003	4.1900e-003	173.5423
Total	**0.0708**	**0.3546**	**0.6445**	**3.1900e-003**	**0.2832**	**2.9300e-003**	**0.2862**	**0.0764**	**2.7600e-003**	**0.0792**	**0.0000**	**306.6757**	**306.6757**	**6.8500e-003**	**0.0241**	**314.0175**

3.4 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1545	1.4091	1.8176	3.0500e-003		0.0596	0.0596		0.0561	0.0561	0.0000	262.0690	262.0690	0.0616	0.0000	263.6091
Total	**0.1545**	**1.4091**	**1.8176**	**3.0500e-003**		**0.0596**	**0.0596**		**0.0561**	**0.0561**	**0.0000**	**262.0690**	**262.0690**	**0.0616**	**0.0000**	**263.6091**

3.4 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0100e-003	0.2719	0.0809	1.1700e-003	0.0408	1.6100e-003	0.0424	0.0118	1.5400e-003	0.0133	0.0000	114.1016	114.1016	2.4400e-003	0.0169	119.1842
Worker	0.0523	0.0305	0.4529	1.5200e-003	0.2045	8.6000e-004	0.2053	0.0544	7.9000e-004	0.0552	0.0000	145.9578	145.9578	3.1900e-003	3.4500e-003	147.0668
Total	**0.0583**	**0.3024**	**0.5338**	**2.6900e-003**	**0.2453**	**2.4700e-003**	**0.2477**	**0.0662**	**2.3300e-003**	**0.0685**	**0.0000**	**260.0594**	**260.0594**	**5.6300e-003**	**0.0203**	**266.2510**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1545	1.4091	1.8176	3.0500e-003		0.0596	0.0596		0.0561	0.0561	0.0000	262.0687	262.0687	0.0616	0.0000	263.6088
Total	**0.1545**	**1.4091**	**1.8176**	**3.0500e-003**		**0.0596**	**0.0596**		**0.0561**	**0.0561**	**0.0000**	**262.0687**	**262.0687**	**0.0616**	**0.0000**	**263.6088**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0100e-003	0.2719	0.0809	1.1700e-003	0.0408	1.6100e-003	0.0424	0.0118	1.5400e-003	0.0133	0.0000	114.1016	114.1016	2.4400e-003	0.0169	119.1842
Worker	0.0523	0.0305	0.4529	1.5200e-003	0.2045	8.6000e-004	0.2053	0.0544	7.9000e-004	0.0552	0.0000	145.9578	145.9578	3.1900e-003	3.4500e-003	147.0668
Total	**0.0583**	**0.3024**	**0.5338**	**2.6900e-003**	**0.2453**	**2.4700e-003**	**0.2477**	**0.0662**	**2.3300e-003**	**0.0685**	**0.0000**	**260.0594**	**260.0594**	**5.6300e-003**	**0.0203**	**266.2510**

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0232	0.2238	0.3437	5.4000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	47.0624	47.0624	0.0152	0.0000	47.4429
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0232**	**0.2238**	**0.3437**	**5.4000e-004**		**0.0110**	**0.0110**		**0.0101**	**0.0101**	**0.0000**	**47.0624**	**47.0624**	**0.0152**	**0.0000**	**47.4429**

3.5 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.4000e-004	5.5000e-004	7.3000e-003	2.0000e-005	2.7900e-003	1.0000e-005	2.8000e-003	7.4000e-004	1.0000e-005	7.5000e-004	0.0000	2.1292	2.1292	6.0000e-005	6.0000e-005	2.1472
Total	**8.4000e-004**	**5.5000e-004**	**7.3000e-003**	**2.0000e-005**	**2.7900e-003**	**1.0000e-005**	**2.8000e-003**	**7.4000e-004**	**1.0000e-005**	**7.5000e-004**	**0.0000**	**2.1292**	**2.1292**	**6.0000e-005**	**6.0000e-005**	**2.1472**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0232	0.2238	0.3437	5.4000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	47.0623	47.0623	0.0152	0.0000	47.4428
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0232**	**0.2238**	**0.3437**	**5.4000e-004**		**0.0110**	**0.0110**		**0.0101**	**0.0101**	**0.0000**	**47.0623**	**47.0623**	**0.0152**	**0.0000**	**47.4428**

3.5 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.4000e-004	5.5000e-004	7.3000e-003	2.0000e-005	2.7900e-003	1.0000e-005	2.8000e-003	7.4000e-004	1.0000e-005	7.5000e-004	0.0000	2.1292	2.1292	6.0000e-005	6.0000e-005	2.1472
Total	**8.4000e-004**	**5.5000e-004**	**7.3000e-003**	**2.0000e-005**	**2.7900e-003**	**1.0000e-005**	**2.8000e-003**	**7.4000e-004**	**1.0000e-005**	**7.5000e-004**	**0.0000**	**2.1292**	**2.1292**	**6.0000e-005**	**6.0000e-005**	**2.1472**

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6600e-003	0.0343	0.0583	9.0000e-005		1.6700e-003	1.6700e-003		1.5400e-003	1.5400e-003	0.0000	8.0077	8.0077	2.5900e-003	0.0000	8.0725
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.6600e-003**	**0.0343**	**0.0583**	**9.0000e-005**		**1.6700e-003**	**1.6700e-003**		**1.5400e-003**	**1.5400e-003**	**0.0000**	**8.0077**	**8.0077**	**2.5900e-003**	**0.0000**	**8.0725**

3.5 Paving - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	8.0000e-005	1.1700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3538	0.3538	1.0000e-005	1.0000e-005	0.3566
Total	**1.4000e-004**	**8.0000e-005**	**1.1700e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.3538**	**0.3538**	**1.0000e-005**	**1.0000e-005**	**0.3566**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6600e-003	0.0343	0.0583	9.0000e-005		1.6700e-003	1.6700e-003		1.5400e-003	1.5400e-003	0.0000	8.0077	8.0077	2.5900e-003	0.0000	8.0724
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.6600e-003**	**0.0343**	**0.0583**	**9.0000e-005**		**1.6700e-003**	**1.6700e-003**		**1.5400e-003**	**1.5400e-003**	**0.0000**	**8.0077**	**8.0077**	**2.5900e-003**	**0.0000**	**8.0724**

3.5 Paving - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	8.0000e-005	1.1700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3538	0.3538	1.0000e-005	1.0000e-005	0.3566
Total	**1.4000e-004**	**8.0000e-005**	**1.1700e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.3538**	**0.3538**	**1.0000e-005**	**1.0000e-005**	**0.3566**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.6635					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.1392	0.2198	3.6000e-004		6.2600e-003	6.2600e-003		6.2600e-003	6.2600e-003	0.0000	31.0220	31.0220	1.6900e-003	0.0000	31.0643
Total	**1.6843**	**0.1392**	**0.2198**	**3.6000e-004**		**6.2600e-003**	**6.2600e-003**		**6.2600e-003**	**6.2600e-003**	**0.0000**	**31.0220**	**31.0220**	**1.6900e-003**	**0.0000**	**31.0643**

3.6 Architectural Coating - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0126	7.8800e-003	0.1087	3.5000e-004	0.0442	2.1000e-004	0.0444	0.0118	1.9000e-004	0.0119	0.0000	32.9523	32.9523	8.2000e-004	8.3000e-004	33.2201
Total	**0.0126**	**7.8800e-003**	**0.1087**	**3.5000e-004**	**0.0442**	**2.1000e-004**	**0.0444**	**0.0118**	**1.9000e-004**	**0.0119**	**0.0000**	**32.9523**	**32.9523**	**8.2000e-004**	**8.3000e-004**	**33.2201**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.6635					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.1392	0.2198	3.6000e-004		6.2600e-003	6.2600e-003		6.2600e-003	6.2600e-003	0.0000	31.0220	31.0220	1.6900e-003	0.0000	31.0643
Total	**1.6843**	**0.1392**	**0.2198**	**3.6000e-004**		**6.2600e-003**	**6.2600e-003**		**6.2600e-003**	**6.2600e-003**	**0.0000**	**31.0220**	**31.0220**	**1.6900e-003**	**0.0000**	**31.0643**

3.6 Architectural Coating - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0126	7.8800e-003	0.1087	3.5000e-004	0.0442	2.1000e-004	0.0444	0.0118	1.9000e-004	0.0119	0.0000	32.9523	32.9523	8.2000e-004	8.3000e-004	33.2201
Total	**0.0126**	**7.8800e-003**	**0.1087**	**3.5000e-004**	**0.0442**	**2.1000e-004**	**0.0444**	**0.0118**	**1.9000e-004**	**0.0119**	**0.0000**	**32.9523**	**32.9523**	**8.2000e-004**	**8.3000e-004**	**33.2201**

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.7867					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3200	33.3200	1.8200e-003	0.0000	33.3654
Total	**1.8090**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3200**	**33.3200**	**1.8200e-003**	**0.0000**	**33.3654**

3.6 Architectural Coating - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0128	7.7000e-003	0.1104	3.6000e-004	0.0474	2.1000e-004	0.0477	0.0126	2.0000e-004	0.0128	0.0000	34.5890	34.5890	8.0000e-004	8.4000e-004	34.8600
Total	**0.0128**	**7.7000e-003**	**0.1104**	**3.6000e-004**	**0.0474**	**2.1000e-004**	**0.0477**	**0.0126**	**2.0000e-004**	**0.0128**	**0.0000**	**34.5890**	**34.5890**	**8.0000e-004**	**8.4000e-004**	**34.8600**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.7867					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3199	33.3199	1.8200e-003	0.0000	33.3654
Total	**1.8090**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3199**	**33.3199**	**1.8200e-003**	**0.0000**	**33.3654**

3.6 Architectural Coating - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0128	7.7000e-003	0.1104	3.6000e-004	0.0474	2.1000e-004	0.0477	0.0126	2.0000e-004	0.0128	0.0000	34.5890	34.5890	8.0000e-004	8.4000e-004	34.8600
Total	**0.0128**	**7.7000e-003**	**0.1104**	**3.6000e-004**	**0.0474**	**2.1000e-004**	**0.0477**	**0.0126**	**2.0000e-004**	**0.0128**	**0.0000**	**34.5890**	**34.5890**	**8.0000e-004**	**8.4000e-004**	**34.8600**

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.6156					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0202	0.1352	0.2135	3.5000e-004		6.0800e-003	6.0800e-003		6.0800e-003	6.0800e-003	0.0000	30.1284	30.1284	1.6400e-003	0.0000	30.1695
Total	**1.6357**	**0.1352**	**0.2135**	**3.5000e-004**		**6.0800e-003**	**6.0800e-003**		**6.0800e-003**	**6.0800e-003**	**0.0000**	**30.1284**	**30.1284**	**1.6400e-003**	**0.0000**	**30.1695**

3.6 Architectural Coating - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0110	6.3900e-003	0.0950	3.2000e-004	0.0429	1.8000e-004	0.0431	0.0114	1.7000e-004	0.0116	0.0000	30.6163	30.6163	6.7000e-004	7.2000e-004	30.8490
Total	**0.0110**	**6.3900e-003**	**0.0950**	**3.2000e-004**	**0.0429**	**1.8000e-004**	**0.0431**	**0.0114**	**1.7000e-004**	**0.0116**	**0.0000**	**30.6163**	**30.6163**	**6.7000e-004**	**7.2000e-004**	**30.8490**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.6156					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0202	0.1352	0.2135	3.5000e-004		6.0800e-003	6.0800e-003		6.0800e-003	6.0800e-003	0.0000	30.1284	30.1284	1.6400e-003	0.0000	30.1694
Total	**1.6357**	**0.1352**	**0.2135**	**3.5000e-004**		**6.0800e-003**	**6.0800e-003**		**6.0800e-003**	**6.0800e-003**	**0.0000**	**30.1284**	**30.1284**	**1.6400e-003**	**0.0000**	**30.1694**

3.6 Architectural Coating - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0110	6.3900e-003	0.0950	3.2000e-004	0.0429	1.8000e-004	0.0431	0.0114	1.7000e-004	0.0116	0.0000	30.6163	30.6163	6.7000e-004	7.2000e-004	30.8490
Total	**0.0110**	**6.3900e-003**	**0.0950**	**3.2000e-004**	**0.0429**	**1.8000e-004**	**0.0431**	**0.0114**	**1.7000e-004**	**0.0116**	**0.0000**	**30.6163**	**30.6163**	**6.7000e-004**	**7.2000e-004**	**30.8490**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.6700	1.7715	15.2422	0.0312	3.6447	0.0227	3.6674	0.9738	0.0212	0.9949	0.0000	2,988.7908	2,988.7908	0.1949	0.1434	3,036.3895
Unmitigated	1.6851	1.7977	15.4637	0.0318	3.7191	0.0231	3.7422	0.9937	0.0215	1.0152	0.0000	3,047.6346	3,047.6346	0.1972	0.1455	3,095.9181

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	390.00	390.00	390.00	900,747	882,732
Regional Shopping Center	1,510.00	1,510.00	1510.00	2,647,490	2,594,540
Single Family Housing	2,832.00	2,832.00	2832.00	6,540,808	6,409,992
Total	4,732.00	4,732.00	4,732.00	10,089,045	9,887,264

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Congregate Care (Assisted	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	309.5411	309.5411	0.0501	6.0700e-003	312.6019
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	309.5411	309.5411	0.0501	6.0700e-003	312.6019
NaturalGas Mitigated	0.0504	0.4306	0.1852	2.7500e-003		0.0348	0.0348		0.0348	0.0348	0.0000	498.4027	498.4027	9.5500e-003	9.1400e-003	501.3645
NaturalGas Unmitigated	0.0504	0.4306	0.1852	2.7500e-003		0.0348	0.0348		0.0348	0.0348	0.0000	498.4027	498.4027	9.5500e-003	9.1400e-003	501.3645

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Congregate Care (Assisted Living)	1.25725e+006	6.7800e-003	0.0579	0.0247	3.7000e-004		4.6800e-003	4.6800e-003		4.6800e-003	4.6800e-003	0.0000	67.0918	67.0918	1.2900e-003	1.2300e-003	67.4905
Regional Shopping Center	93600	5.0000e-004	4.5900e-003	3.8500e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9949	4.9949	1.0000e-004	9.0000e-005	5.0245
Single Family Housing	7.98886e+006	0.0431	0.3681	0.1566	2.3500e-003		0.0298	0.0298		0.0298	0.0298	0.0000	426.3161	426.3161	8.1700e-003	7.8200e-003	428.8495
Total		**0.0504**	**0.4306**	**0.1851**	**2.7500e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**	**0.0000**	**498.4027**	**498.4027**	**9.5600e-003**	**9.1400e-003**	**501.3645**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Congregate Care (Assisted Living)	1.25725e+006	6.7800e-003	0.0579	0.0247	3.7000e-004		4.6800e-003	4.6800e-003		4.6800e-003	4.6800e-003	0.0000	67.0918	67.0918	1.2900e-003	1.2300e-003	67.4905
Regional Shopping Center	93600	5.0000e-004	4.5900e-003	3.8500e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9949	4.9949	1.0000e-004	9.0000e-005	5.0245
Single Family Housing	7.98886e+006	0.0431	0.3681	0.1566	2.3500e-003		0.0298	0.0298		0.0298	0.0298	0.0000	426.3161	426.3161	8.1700e-003	7.8200e-003	428.8495
Total		**0.0504**	**0.4306**	**0.1851**	**2.7500e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**	**0.0000**	**498.4027**	**498.4027**	**9.5600e-003**	**9.1400e-003**	**501.3645**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Congregate Care (Assisted Living)	579965	53.6605	8.6800e-003	1.0500e-003	54.1911
Regional Shopping Center	415600	38.4529	6.2200e-003	7.5000e-004	38.8331
Single Family Housing	2.34997e+006	217.4277	0.0352	4.2600e-003	219.5777
Total		**309.5411**	**0.0501**	**6.0600e-003**	**312.6019**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Congregate Care (Assisted Living)	579965	53.6605	8.6800e-003	1.0500e-003	54.1911
Regional Shopping Center	415600	38.4529	6.2200e-003	7.5000e-004	38.8331
Single Family Housing	2.34997e+006	217.4277	0.0352	4.2600e-003	219.5777
Total		**309.5411**	**0.0501**	**6.0600e-003**	**312.6019**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.4610	0.0656	3.3501	3.5000e-004		0.0207	0.0207		0.0207	0.0207	0.0000	36.9182	36.9182	5.8300e-003	5.8000e-004	37.2358
Unmitigated	5.5721	0.0852	6.3862	6.4200e-003		0.4574	0.4574		0.4574	0.4574	44.9718	17.6305	62.6023	0.0883	2.6300e-003	65.5922

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.5066					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.8510					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.1143	0.0467	3.0477	6.2500e-003		0.4389	0.4389		0.4389	0.4389	44.9718	12.1718	57.1436	0.0830	2.6300e-003	60.0028
Landscaping	0.1003	0.0385	3.3385	1.8000e-004		0.0185	0.0185		0.0185	0.0185	0.0000	5.4587	5.4587	5.2300e-003	0.0000	5.5894
Total	**5.5721**	**0.0852**	**6.3862**	**6.4300e-003**		**0.4574**	**0.4574**		**0.4574**	**0.4574**	**44.9718**	**17.6305**	**62.6023**	**0.0883**	**2.6300e-003**	**65.5922**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.5066					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.8510					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.1800e-003	0.0272	0.0116	1.7000e-004		2.2000e-003	2.2000e-003		2.2000e-003	2.2000e-003	0.0000	31.4595	31.4595	6.0000e-004	5.8000e-004	31.6465
Landscaping	0.1003	0.0385	3.3385	1.8000e-004		0.0185	0.0185		0.0185	0.0185	0.0000	5.4587	5.4587	5.2300e-003	0.0000	5.5894
Total	**3.4610**	**0.0656**	**3.3501**	**3.5000e-004**		**0.0207**	**0.0207**		**0.0207**	**0.0207**	**0.0000**	**36.9182**	**36.9182**	**5.8300e-003**	**5.8000e-004**	**37.2358**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	29.6797	0.9500	0.0228	60.2117
Unmitigated	32.9774	1.0556	0.0253	66.9019

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Congregate Care (Assisted Living)	9.7731 / 6.1613	9.9887	0.3196	7.6500e-003	20.2590
Regional Shopping Center	2.9629 / 1.81597	3.0114	0.0969	2.3200e-003	6.1249
Single Family Housing	19.5462 / 12.3226	19.9773	0.6391	0.0153	40.5180
Total		**32.9774**	**1.0556**	**0.0253**	**66.9019**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Congregate Care (Assisted Living)	8.79579 / 5.54517	8.9898	0.2876	6.8900e-003	18.2331
Regional Shopping Center	2.66661 / 1.63437	2.7103	0.0872	2.0900e-003	5.5124
Single Family Housing	17.5916 / 11.0903	17.9796	0.5752	0.0138	36.4662
Total		**29.6797**	**0.9500**	**0.0228**	**60.2117**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	109.4609	6.4690	0.0000	271.1846
Unmitigated	109.4609	6.4690	0.0000	271.1846

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Congregate Care (Assisted Living)	136.88	27.7854	1.6421	0.0000	68.8372
Regional Shopping Center	42	8.5256	0.5039	0.0000	21.1219
Single Family Housing	360.36	73.1498	4.3230	0.0000	181.2256
Total		**109.4608**	**6.4690**	**0.0000**	**271.1846**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Congregate Care (Assisted Living)	136.88	27.7854	1.6421	0.0000	68.8372
Regional Shopping Center	42	8.5256	0.5039	0.0000	21.1219
Single Family Housing	360.36	73.1498	4.3230	0.0000	181.2256
Total		**109.4608**	**6.4690**	**0.0000**	**271.1846**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch Project

Bay Area AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Congregate Care (Assisted Living)	150.00	Dwelling Unit	9.38	150,000.00	429
Single Family Housing	300.00	Dwelling Unit	37.10	540,000.00	858
Regional Shopping Center	40.00	1000sqft	0.92	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site plan.

Construction Phase - Grading phase updating per project-specific info, and architectural coating phase set to occur concurrently with building construction.

Grading - Material export updated.

Vehicle Trips - Trip rates updated to match project-specific traffic report.

Mobile Land Use Mitigation - Project would improve pedestrian network.

Area Mitigation - Only natural gas hearths installed.

Water Mitigation - Water conservation strategy applied, per AQ Questionnaire.

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	75.00	120.00
tblConstructionPhase	NumDays	55.00	740.00
tblConstructionPhase	PhaseEndDate	8/23/2024	10/25/2024
tblConstructionPhase	PhaseEndDate	9/10/2027	1/10/2025
tblConstructionPhase	PhaseEndDate	6/25/2027	11/12/2027
tblConstructionPhase	PhaseStartDate	6/26/2027	10/26/2024
tblConstructionPhase	PhaseStartDate	8/24/2024	1/11/2025
tblConstructionPhase	PhaseStartDate	9/11/2027	1/25/2025
tblGrading	MaterialExported	0.00	300,000.00
tblLandUse	LotAcreage	97.40	37.10
tblVehicleTrips	ST_TR	2.93	2.60
tblVehicleTrips	ST_TR	46.12	37.75
tblVehicleTrips	ST_TR	9.54	9.44
tblVehicleTrips	SU_TR	3.15	2.60
tblVehicleTrips	SU_TR	21.10	37.75
tblVehicleTrips	SU_TR	8.55	9.44

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.9350	73.2659	38.1418	0.2489	19.8049	1.6817	21.0349	10.1417	1.5599	11.2733	0.0000	26,381.7992	26,381.7992	2.6244	3.2094	27,403.7961
2025	15.9389	16.3102	24.3603	0.0590	2.6316	0.6037	3.2353	0.7065	0.5709	1.2774	0.0000	5,901.9937	5,901.9937	0.7160	0.2124	5,982.3447
2026	15.9014	16.2658	24.0305	0.0583	2.6316	0.6031	3.2347	0.7065	0.5704	1.2769	0.0000	5,837.2680	5,837.2680	0.6782	0.2069	5,915.8853
2027	15.8672	16.2236	23.7517	0.0575	2.6316	0.6025	3.2341	0.7065	0.5698	1.2763	0.0000	5,774.9490	5,774.9490	0.6748	0.2016	5,851.8896
Maximum	**15.9389**	**73.2659**	**38.1418**	**0.2489**	**19.8049**	**1.6817**	**21.0349**	**10.1417**	**1.5599**	**11.2733**	**0.0000**	**26,381.7992**	**26,381.7992**	**2.6244**	**3.2094**	**27,403.7961**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.9350	73.2659	38.1418	0.2489	19.8049	1.6817	21.0349	10.1417	1.5599	11.2733	0.0000	26,381.7992	26,381.7992	2.6244	3.2094	27,403.7961
2025	15.9389	16.3102	24.3603	0.0590	2.6316	0.6037	3.2353	0.7065	0.5709	1.2774	0.0000	5,901.9937	5,901.9937	0.7160	0.2124	5,982.3447
2026	15.9014	16.2658	24.0305	0.0583	2.6316	0.6031	3.2347	0.7065	0.5704	1.2769	0.0000	5,837.2680	5,837.2680	0.6782	0.2069	5,915.8853
2027	15.8672	16.2236	23.7517	0.0575	2.6316	0.6025	3.2341	0.7065	0.5698	1.2763	0.0000	5,774.9490	5,774.9490	0.6748	0.2016	5,851.8896
Maximum	**15.9389**	**73.2659**	**38.1418**	**0.2489**	**19.8049**	**1.6817**	**21.0349**	**10.1417**	**1.5599**	**11.2733**	**0.0000**	**26,381.7992**	**26,381.7992**	**2.6244**	**3.2094**	**27,403.7961**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	392.0960	7.7772	520.6844	0.9162		68.6335	68.6335		68.6335	68.6335	7,369.1285	2,475.6808	9,844.8093	9.3414	0.5201	10,233.3463
Energy	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724
Mobile	10.4016	9.0985	83.8816	0.1840	21.2375	0.1271	21.3646	5.6568	0.1184	5.7751		19,444.4103	19,444.4103	1.1163	0.8369	19,721.7236
Total	**402.7735**	**19.2353**	**605.5806**	**1.1153**	**21.2375**	**68.9512**	**90.1887**	**5.6568**	**68.9425**	**74.5992**	**7,369.1285**	**24,930.4744**	**32,299.6029**	**10.5154**	**1.4123**	**32,983.3424**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.0825	5.3042	39.1698	0.0331		0.6001	0.6001		0.6001	0.6001	0.0000	6,292.7396	6,292.7396	0.1834	0.1141	6,331.3379
Energy	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724
Mobile	10.3207	8.9657	82.5867	0.1805	20.8128	0.1249	20.9376	5.5436	0.1163	5.6599		19,068.1003	19,068.1003	1.1021	0.8247	19,341.4154
Total	**30.6792**	**16.6296**	**122.7710**	**0.2286**	**20.8128**	**0.9156**	**21.7284**	**5.5436**	**0.9071**	**6.4507**	**0.0000**	**28,371.2232**	**28,371.2232**	**1.3432**	**0.9940**	**28,701.0257**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	92.38	13.55	79.73	79.50	2.00	98.67	75.91	2.00	98.68	91.35	100.00	-13.80	12.16	87.23	29.61	12.98

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/10/2024	5	30	
2	Grading	Grading	5/11/2024	10/25/2024	5	120	
3	Building Construction	Building Construction	1/11/2025	11/12/2027	5	740	
4	Paving	Paving	10/26/2024	1/10/2025	5	55	
5	Architectural Coating	Architectural Coating	1/25/2025	11/26/2027	5	740	

Acres of Grading (Site Preparation Phase): 45

Acres of Grading (Grading Phase): 360

Acres of Paving: 0

Residential Indoor: 1,397,250; Residential Outdoor: 465,750; Non-Residential Indoor: 60,000; Non-Residential Outdoor: 20,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	229.00	55.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310		3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**		**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0455	0.0250	0.4010	1.2400e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		127.9370	127.9370	2.9900e-003	2.9000e-003	128.8764
Total	**0.0455**	**0.0250**	**0.4010**	**1.2400e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**127.9370**	**127.9370**	**2.9900e-003**	**2.9000e-003**	**128.8764**

3.2 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310	0.0000	3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**	**0.0000**	**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0455	0.0250	0.4010	1.2400e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		127.9370	127.9370	2.9900e-003	2.9000e-003	128.8764
Total	**0.0455**	**0.0250**	**0.4010**	**1.2400e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**127.9370**	**127.9370**	**2.9900e-003**	**2.9000e-003**	**128.8764**

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286		6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**		**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6663	40.8612	9.9734	0.1854	5.4661	0.3455	5.8117	1.4983	0.3306	1.8289		20,229.8983	20,229.8983	0.6774	3.2061	21,202.2596
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0505	0.0278	0.4456	1.3800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		142.1522	142.1522	3.3200e-003	3.2200e-003	143.1960
Total	**0.7169**	**40.8890**	**10.4190**	**0.1868**	**5.6304**	**0.3463**	**5.9767**	**1.5419**	**0.3313**	**1.8732**		**20,372.0505**	**20,372.0505**	**0.6807**	**3.2094**	**21,345.4556**

3.3 Grading - 2024

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286	0.0000	6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**	**0.0000**	**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.6663	40.8612	9.9734	0.1854	5.4661	0.3455	5.8117	1.4983	0.3306	1.8289		20,229.8983	20,229.8983	0.6774	3.2061	21,202.2596
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0505	0.0278	0.4456	1.3800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		142.1522	142.1522	3.3200e-003	3.2200e-003	143.1960
Total	**0.7169**	**40.8890**	**10.4190**	**0.1868**	**5.6304**	**0.3463**	**5.9767**	**1.5419**	**0.3313**	**1.8732**		**20,372.0505**	**20,372.0505**	**0.6807**	**3.2094**	**21,345.4556**

3.4 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.474 4	2,556.474 4	0.6010		2,571.498 1
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.474 4**	**2,556.474 4**	**0.6010**		**2,571.498 1**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0567	2.3513	0.7242	0.0108	0.3725	0.0144	0.3869	0.1073	0.0138	0.1210		1,156.428 2	1,156.428 2	0.0242	0.1709	1,207.951 2
Worker	0.5435	0.2863	4.7817	0.0153	1.8812	8.5000e-003	1.8897	0.4990	7.8300e-003	0.5068		1,588.546 4	1,588.546 4	0.0345	0.0346	1,599.722 0
Total	**0.6002**	**2.6375**	**5.5059**	**0.0260**	**2.2537**	**0.0229**	**2.2766**	**0.6062**	**0.0216**	**0.6278**		**2,744.974 6**	**2,744.974 6**	**0.0587**	**0.2055**	**2,807.673 2**

3.4 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0567	2.3513	0.7242	0.0108	0.3725	0.0144	0.3869	0.1073	0.0138	0.1210		1,156.4282	1,156.4282	0.0242	0.1709	1,207.9512
Worker	0.5435	0.2863	4.7817	0.0153	1.8812	8.5000e-003	1.8897	0.4990	7.8300e-003	0.5068		1,588.5464	1,588.5464	0.0345	0.0346	1,599.7220
Total	**0.6002**	**2.6375**	**5.5059**	**0.0260**	**2.2537**	**0.0229**	**2.2766**	**0.6062**	**0.0216**	**0.6278**		**2,744.9746**	**2,744.9746**	**0.0587**	**0.2055**	**2,807.6732**

3.4 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0555	2.3376	0.7138	0.0106	0.3725	0.0143	0.3869	0.1073	0.0137	0.1210		1,135.2318	1,135.2318	0.0241	0.1676	1,185.7895
Worker	0.5133	0.2607	4.5158	0.0148	1.8812	8.1000e-003	1.8893	0.4990	7.4600e-003	0.5064		1,552.2983	1,552.2983	0.0315	0.0327	1,562.8341
Total	**0.5688**	**2.5982**	**5.2296**	**0.0254**	**2.2537**	**0.0224**	**2.2761**	**0.6062**	**0.0212**	**0.6274**		**2,687.5302**	**2,687.5302**	**0.0556**	**0.2004**	**2,748.6236**

3.4 Building Construction - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0555	2.3376	0.7138	0.0106	0.3725	0.0143	0.3869	0.1073	0.0137	0.1210		1,135.2318	1,135.2318	0.0241	0.1676	1,185.7895
Worker	0.5133	0.2607	4.5158	0.0148	1.8812	8.1000e-003	1.8893	0.4990	7.4600e-003	0.5064		1,552.2983	1,552.2983	0.0315	0.0327	1,562.8341
Total	**0.5688**	**2.5982**	**5.2296**	**0.0254**	**2.2537**	**0.0224**	**2.2761**	**0.6062**	**0.0212**	**0.6274**		**2,687.5302**	**2,687.5302**	**0.0556**	**0.2004**	**2,748.6236**

3.4 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0544	2.3210	0.7047	0.0104	0.3725	0.0142	0.3868	0.1073	0.0136	0.1209		1,112.3378	1,112.3378	0.0239	0.1642	1,161.8627
Worker	0.4857	0.2393	4.2912	0.0144	1.8812	7.6400e-003	1.8888	0.4990	7.0300e-003	0.5060		1,519.4681	1,519.4681	0.0289	0.0311	1,529.4676
Total	**0.5401**	**2.5603**	**4.9959**	**0.0247**	**2.2537**	**0.0219**	**2.2756**	**0.6062**	**0.0206**	**0.6269**		**2,631.8059**	**2,631.8059**	**0.0527**	**0.1953**	**2,691.3303**

3.4 Building Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0544	2.3210	0.7047	0.0104	0.3725	0.0142	0.3868	0.1073	0.0136	0.1209		1,112.3378	1,112.3378	0.0239	0.1642	1,161.8627
Worker	0.4857	0.2393	4.2912	0.0144	1.8812	7.6400e-003	1.8888	0.4990	7.0300e-003	0.5060		1,519.4681	1,519.4681	0.0289	0.0311	1,529.4676
Total	**0.5401**	**2.5603**	**4.9959**	**0.0247**	**2.2537**	**0.0219**	**2.2756**	**0.6062**	**0.0206**	**0.6269**		**2,631.8059**	**2,631.8059**	**0.0527**	**0.1953**	**2,691.3303**

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.547 2	2,207.547 2	0.7140		2,225.396 3
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.547 2**	**2,207.547 2**	**0.7140**		**2,225.396 3**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0379	0.0208	0.3342	1.0300e-003	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		106.6142	106.6142	2.4900e-003	2.4200e-003	107.3970
Total	**0.0379**	**0.0208**	**0.3342**	**1.0300e-003**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**106.6142**	**106.6142**	**2.4900e-003**	**2.4200e-003**	**107.3970**

3.5 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0379	0.0208	0.3342	1.0300e-003	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		106.6142	106.6142	2.4900e-003	2.4200e-003	107.3970
Total	**0.0379**	**0.0208**	**0.3342**	**1.0300e-003**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**106.6142**	**106.6142**	**2.4900e-003**	**2.4200e-003**	**107.3970**

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.745 2	2,206.745 2	0.7137		2,224.587 8
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.745 2**	**2,206.745 2**	**0.7137**		**2,224.587 8**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0356	0.0188	0.3132	1.0000e-003	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		104.0533	104.0533	2.2600e-003	2.2700e-003	104.7853
Total	**0.0356**	**0.0188**	**0.3132**	**1.0000e-003**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**104.0533**	**104.0533**	**2.2600e-003**	**2.2700e-003**	**104.7853**

3.5 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850	0.0000	2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**	**0.0000**	**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0356	0.0188	0.3132	1.0000e-003	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		104.0533	104.0533	2.2600e-003	2.2700e-003	104.7853
Total	**0.0356**	**0.0188**	**0.3132**	**1.0000e-003**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**104.0533**	**104.0533**	**2.2600e-003**	**2.2700e-003**	**104.7853**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1092	0.0575	0.9605	3.0600e-003	0.3779	1.7100e-003	0.3796	0.1002	1.5700e-003	0.1018		319.0967	319.0967	6.9300e-003	6.9500e-003	321.3415
Total	**0.1092**	**0.0575**	**0.9605**	**3.0600e-003**	**0.3779**	**1.7100e-003**	**0.3796**	**0.1002**	**1.5700e-003**	**0.1018**		**319.0967**	**319.0967**	**6.9300e-003**	**6.9500e-003**	**321.3415**

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1092	0.0575	0.9605	3.0600e-003	0.3779	1.7100e-003	0.3796	0.1002	1.5700e-003	0.1018		319.0967	319.0967	6.9300e-003	6.9500e-003	321.3415
Total	**0.1092**	**0.0575**	**0.9605**	**3.0600e-003**	**0.3779**	**1.7100e-003**	**0.3796**	**0.1002**	**1.5700e-003**	**0.1018**		**319.0967**	**319.0967**	**6.9300e-003**	**6.9500e-003**	**321.3415**

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1031	0.0524	0.9071	2.9700e-003	0.3779	1.6300e-003	0.3795	0.1002	1.5000e-003	0.1017		311.8154	311.8154	6.3200e-003	6.5700e-003	313.9317
Total	**0.1031**	**0.0524**	**0.9071**	**2.9700e-003**	**0.3779**	**1.6300e-003**	**0.3795**	**0.1002**	**1.5000e-003**	**0.1017**		**311.8154**	**311.8154**	**6.3200e-003**	**6.5700e-003**	**313.9317**

3.6 Architectural Coating - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1031	0.0524	0.9071	2.9700e-003	0.3779	1.6300e-003	0.3795	0.1002	1.5000e-003	0.1017		311.8154	311.8154	6.3200e-003	6.5700e-003	313.9317
Total	**0.1031**	**0.0524**	**0.9071**	**2.9700e-003**	**0.3779**	**1.6300e-003**	**0.3795**	**0.1002**	**1.5000e-003**	**0.1017**		**311.8154**	**311.8154**	**6.3200e-003**	**6.5700e-003**	**313.9317**

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0976	0.0481	0.8620	2.8800e-003	0.3779	1.5400e-003	0.3794	0.1002	1.4100e-003	0.1016		305.2207	305.2207	5.8000e-003	6.2500e-003	307.2293
Total	**0.0976**	**0.0481**	**0.8620**	**2.8800e-003**	**0.3779**	**1.5400e-003**	**0.3794**	**0.1002**	**1.4100e-003**	**0.1016**		**305.2207**	**305.2207**	**5.8000e-003**	**6.2500e-003**	**307.2293**

3.6 Architectural Coating - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0976	0.0481	0.8620	2.8800e-003	0.3779	1.5400e-003	0.3794	0.1002	1.4100e-003	0.1016		305.2207	305.2207	5.8000e-003	6.2500e-003	307.2293
Total	**0.0976**	**0.0481**	**0.8620**	**2.8800e-003**	**0.3779**	**1.5400e-003**	**0.3794**	**0.1002**	**1.4100e-003**	**0.1016**		**305.2207**	**305.2207**	**5.8000e-003**	**6.2500e-003**	**307.2293**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	10.3207	8.9657	82.5867	0.1805	20.8128	0.1249	20.9376	5.5436	0.1163	5.6599		19,068.1003	19,068.1003	1.1021	0.8247	19,341.4154
Unmitigated	10.4016	9.0985	83.8816	0.1840	21.2375	0.1271	21.3646	5.6568	0.1184	5.7751		19,444.4103	19,444.4103	1.1163	0.8369	19,721.7236

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	390.00	390.00	390.00	900,747	882,732
Regional Shopping Center	1,510.00	1,510.00	1510.00	2,647,490	2,594,540
Single Family Housing	2,832.00	2,832.00	2832.00	6,540,808	6,409,992
Total	4,732.00	4,732.00	4,732.00	10,089,045	9,887,264

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Congregate Care (Assisted	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.383 2	3,010.383 2	0.0577	0.0552	3,028.272 4
NaturalGas Unmitigated	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.383 2	3,010.383 2	0.0577	0.0552	3,028.272 4

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3444.53	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Regional Shopping Center	256.438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	21887.3	0.2360	2.0171	0.8583	0.0129		0.1631	0.1631		0.1631	0.1631		2,574.9757	2,574.9757	0.0494	0.0472	2,590.2775
Total		**0.2760**	**2.3596**	**1.0145**	**0.0151**		**0.1907**	**0.1907**		**0.1907**	**0.1907**		**3,010.3832**	**3,010.3832**	**0.0577**	**0.0552**	**3,028.2725**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3.44453	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Regional Shopping Center	0.256438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	21.8873	0.2360	2.0171	0.8583	0.0129		0.1631	0.1631		0.1631	0.1631		2,574.9757	2,574.9757	0.0494	0.0472	2,590.2775
Total		**0.2760**	**2.3596**	**1.0145**	**0.0151**		**0.1907**	**0.1907**		**0.1907**	**0.1907**		**3,010.3832**	**3,010.3832**	**0.0577**	**0.0552**	**3,028.2725**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	20.0825	5.3042	39.1698	0.0331		0.6001	0.6001		0.6001	0.6001	0.0000	6,292.7396	6,292.7396	0.1834	0.1141	6,331.3379
Unmitigated	392.0960	7.7772	520.6844	0.9162		68.6335	68.6335		68.6335	68.6335	7,369.1285	2,475.6808	9,844.8093	9.3414	0.5201	10,233.3463

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.6220					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	372.5843	7.3499	483.5900	0.9143		68.4277	68.4277		68.4277	68.4277	7,369.1285	2,408.8235	9,777.9520	9.2773	0.5201	10,164.8881
Landscaping	1.1140	0.4273	37.0945	1.9600e-003		0.2058	0.2058		0.2058	0.2058		66.8573	66.8573	0.0640		68.4582
Total	**392.0960**	**7.7772**	**520.6845**	**0.9162**		**68.6335**	**68.6335**		**68.6335**	**68.6335**	**7,369.1285**	**2,475.6808**	**9,844.8093**	**9.3414**	**0.5201**	**10,233.3463**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.6220					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.5707	4.8769	2.0753	0.0311		0.3943	0.3943		0.3943	0.3943	0.0000	6,225.8824	6,225.8824	0.1193	0.1141	6,262.8797
Landscaping	1.1140	0.4273	37.0945	1.9600e-003		0.2058	0.2058		0.2058	0.2058		66.8573	66.8573	0.0640		68.4582
Total	**20.0825**	**5.3042**	**39.1698**	**0.0331**		**0.6001**	**0.6001**		**0.6001**	**0.6001**	**0.0000**	**6,292.7396**	**6,292.7396**	**0.1834**	**0.1141**	**6,331.3379**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch Project

Bay Area AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Congregate Care (Assisted Living)	150.00	Dwelling Unit	9.38	150,000.00	429
Single Family Housing	300.00	Dwelling Unit	37.10	540,000.00	858
Regional Shopping Center	40.00	1000sqft	0.92	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site plan.

Construction Phase - Grading phase updating per project-specific info, and architectural coating phase set to occur concurrently with building construction.

Grading - Material export updated.

Vehicle Trips - Trip rates updated to match project-specific traffic report.

Mobile Land Use Mitigation - Project would improve pedestrian network.

Area Mitigation - Only natural gas hearths installed.

Water Mitigation - Water conservation strategy applied, per AQ Questionnaire.

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	75.00	120.00
tblConstructionPhase	NumDays	55.00	740.00
tblConstructionPhase	PhaseEndDate	8/23/2024	10/25/2024
tblConstructionPhase	PhaseEndDate	9/10/2027	1/10/2025
tblConstructionPhase	PhaseEndDate	6/25/2027	11/12/2027
tblConstructionPhase	PhaseStartDate	6/26/2027	10/26/2024
tblConstructionPhase	PhaseStartDate	8/24/2024	1/11/2025
tblConstructionPhase	PhaseStartDate	9/11/2027	1/25/2025
tblGrading	MaterialExported	0.00	300,000.00
tblLandUse	LotAcreage	97.40	37.10
tblVehicleTrips	ST_TR	2.93	2.60
tblVehicleTrips	ST_TR	46.12	37.75
tblVehicleTrips	ST_TR	9.54	9.44
tblVehicleTrips	SU_TR	3.15	2.60
tblVehicleTrips	SU_TR	21.10	37.75
tblVehicleTrips	SU_TR	8.55	9.44

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.8959	75.6302	38.2520	0.2489	19.8049	1.6822	21.0349	10.1417	1.5604	11.2733	0.0000	26,391.0696	26,391.0696	2.6226	3.2131	27,414.1295
2025	15.9584	16.5271	24.1778	0.0577	2.6316	0.6037	3.2353	0.7065	0.5710	1.2774	0.0000	5,769.0351	5,769.0351	0.7163	0.2191	5,851.5156
2026	15.9220	16.4748	23.8704	0.0570	2.6316	0.6032	3.2348	0.7065	0.5705	1.2769	0.0000	5,707.5548	5,707.5548	0.6836	0.2132	5,788.1816
2027	15.8885	16.4257	23.6090	0.0563	2.6316	0.6025	3.2341	0.7065	0.5699	1.2763	0.0000	5,648.1207	5,648.1207	0.6799	0.2076	5,726.9703
Maximum	**15.9584**	**75.6302**	**38.2520**	**0.2489**	**19.8049**	**1.6822**	**21.0349**	**10.1417**	**1.5604**	**11.2733**	**0.0000**	**26,391.0696**	**26,391.0696**	**2.6226**	**3.2131**	**27,414.1295**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.8959	75.6302	38.2520	0.2489	19.8049	1.6822	21.0349	10.1417	1.5604	11.2733	0.0000	26,391.0696	26,391.0696	2.6226	3.2131	27,414.1295
2025	15.9584	16.5271	24.1778	0.0577	2.6316	0.6037	3.2353	0.7065	0.5710	1.2774	0.0000	5,769.0351	5,769.0351	0.7163	0.2191	5,851.5156
2026	15.9220	16.4748	23.8704	0.0570	2.6316	0.6032	3.2348	0.7065	0.5705	1.2769	0.0000	5,707.5548	5,707.5548	0.6836	0.2132	5,788.1816
2027	15.8885	16.4257	23.6090	0.0563	2.6316	0.6025	3.2341	0.7065	0.5699	1.2763	0.0000	5,648.1207	5,648.1207	0.6799	0.2076	5,726.9703
Maximum	**15.9584**	**75.6302**	**38.2520**	**0.2489**	**19.8049**	**1.6822**	**21.0349**	**10.1417**	**1.5604**	**11.2733**	**0.0000**	**26,391.0696**	**26,391.0696**	**2.6226**	**3.2131**	**27,414.1295**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	392.0960	7.7772	520.6844	0.9162		68.6335	68.6335		68.6335	68.6335	7,369.1285	2,475.6808	9,844.8093	9.3414	0.5201	10,233.3463
Energy	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724
Mobile	9.2333	10.4353	90.9522	0.1739	21.2375	0.1271	21.3647	5.6568	0.1184	5.7752		18,373.5722	18,373.5722	1.2648	0.9155	18,678.0059
Total	**401.6053**	**20.5722**	**612.6512**	**1.1052**	**21.2375**	**68.9513**	**90.1888**	**5.6568**	**68.9426**	**74.5993**	**7,369.1285**	**23,859.6363**	**31,228.7648**	**10.6638**	**1.4908**	**31,939.6246**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.0825	5.3042	39.1698	0.0331		0.6001	0.6001		0.6001	0.6001	0.0000	6,292.7396	6,292.7396	0.1834	0.1141	6,331.3379
Energy	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724
Mobile	9.1482	10.2839	89.6943	0.1706	20.8128	0.1249	20.9377	5.5436	0.1164	5.6600		18,019.0641	18,019.0641	1.2503	0.9024	18,319.2214
Total	**29.5067**	**17.9478**	**129.8786**	**0.2187**	**20.8128**	**0.9157**	**21.7285**	**5.5436**	**0.9072**	**6.4508**	**0.0000**	**27,322.1870**	**27,322.1870**	**1.4914**	**1.0717**	**27,678.8318**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	92.65	12.76	78.80	80.21	2.00	98.67	75.91	2.00	98.68	91.35	100.00	-14.51	12.51	86.01	28.11	13.34

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/10/2024	5	30	
2	Grading	Grading	5/11/2024	10/25/2024	5	120	
3	Building Construction	Building Construction	1/11/2025	11/12/2027	5	740	
4	Paving	Paving	10/26/2024	1/10/2025	5	55	
5	Architectural Coating	Architectural Coating	1/25/2025	11/26/2027	5	740	

Acres of Grading (Site Preparation Phase): 45

Acres of Grading (Grading Phase): 360

Acres of Paving: 0

Residential Indoor: 1,397,250; Residential Outdoor: 465,750; Non-Residential Indoor: 60,000; Non-Residential Outdoor: 20,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

Grading	Tractors/Loaders/Backhoes		2	8.00	97	0.37
Building Construction	Cranes		1	7.00	231	0.29
Building Construction	Forklifts		3	8.00	89	0.20
Building Construction	Generator Sets		1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes		3	7.00	97	0.37
Building Construction	Welders		1	8.00	46	0.45
Paving	Pavers		2	8.00	130	0.42
Paving	Paving Equipment		2	8.00	132	0.36
Paving	Rollers		2	8.00	80	0.38
Architectural Coating	Air Compressors		1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	229.00	55.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310		3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**		**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0468	0.0308	0.3855	1.1500e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		118.8877	118.8877	3.4100e-003	3.3400e-003	119.9678
Total	**0.0468**	**0.0308**	**0.3855**	**1.1500e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**118.8877**	**118.8877**	**3.4100e-003**	**3.3400e-003**	**119.9678**

3.2 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310	0.0000	3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**	**0.0000**	**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0468	0.0308	0.3855	1.1500e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		118.8877	118.8877	3.4100e-003	3.3400e-003	119.9678
Total	**0.0468**	**0.0308**	**0.3855**	**1.1500e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**118.8877**	**118.8877**	**3.4100e-003**	**3.3400e-003**	**119.9678**

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286		6,009.748 7	6,009.748 7	1.9437		6,058.340 5
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**		**6,009.748 7**	**6,009.748 7**	**1.9437**		**6,058.340 5**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6257	43.2190	10.1009	0.1856	5.4661	0.3461	5.8122	1.4983	0.3311	1.8294		20,249.22 35	20,249.22 35	0.6751	3.2094	21,222.49 15
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0520	0.0342	0.4283	1.2800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		132.0975	132.0975	3.7900e-003	3.7100e-003	133.2975
Total	**0.6778**	**43.2532**	**10.5291**	**0.1869**	**5.6304**	**0.3468**	**5.9773**	**1.5419**	**0.3318**	**1.8737**		**20,381.32 10**	**20,381.32 10**	**0.6789**	**3.2131**	**21,355.78 90**

3.3 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286	0.0000	6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**	**0.0000**	**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6257	43.2190	10.1009	0.1856	5.4661	0.3461	5.8122	1.4983	0.3311	1.8294		20,249.2235	20,249.2235	0.6751	3.2094	21,222.4915
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0520	0.0342	0.4283	1.2800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		132.0975	132.0975	3.7900e-003	3.7100e-003	133.2975
Total	**0.6778**	**43.2532**	**10.5291**	**0.1869**	**5.6304**	**0.3468**	**5.9773**	**1.5419**	**0.3318**	**1.8737**		**20,381.3210**	**20,381.3210**	**0.6789**	**3.2131**	**21,355.7890**

3.4 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.474 4	2,556.474 4	0.6010		2,571.498 1
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.474 4**	**2,556.474 4**	**0.6010**		**2,571.498 1**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0546	2.4880	0.7496	0.0108	0.3725	0.0145	0.3870	0.1073	0.0138	0.1211		1,158.154 2	1,158.154 2	0.0241	0.1713	1,209.799 0
Worker	0.5616	0.3530	4.6087	0.0142	1.8812	8.5000e-003	1.8897	0.4990	7.8300e-003	0.5068		1,476.390 9	1,476.390 9	0.0395	0.0398	1,489.238 4
Total	**0.6161**	**2.8411**	**5.3583**	**0.0250**	**2.2537**	**0.0230**	**2.2767**	**0.6062**	**0.0217**	**0.6279**		**2,634.545 1**	**2,634.545 1**	**0.0635**	**0.2111**	**2,699.037 4**

3.4 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0546	2.4880	0.7496	0.0108	0.3725	0.0145	0.3870	0.1073	0.0138	0.1211		1,158.1542	1,158.1542	0.0241	0.1713	1,209.7990
Worker	0.5616	0.3530	4.6087	0.0142	1.8812	8.5000e-003	1.8897	0.4990	7.8300e-003	0.5068		1,476.3909	1,476.3909	0.0395	0.0398	1,489.2384
Total	**0.6161**	**2.8411**	**5.3583**	**0.0250**	**2.2537**	**0.0230**	**2.2767**	**0.6062**	**0.0217**	**0.6279**		**2,634.5451**	**2,634.5451**	**0.0635**	**0.2111**	**2,699.0374**

3.4 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0533	2.4736	0.7389	0.0106	0.3725	0.0144	0.3869	0.1073	0.0138	0.1210		1,136.9550	1,136.9550	0.0239	0.1681	1,187.6312
Worker	0.5323	0.3214	4.3616	0.0137	1.8812	8.1000e-003	1.8893	0.4990	7.4600e-003	0.5064		1,442.8477	1,442.8477	0.0361	0.0376	1,454.9582
Total	**0.5855**	**2.7950**	**5.1005**	**0.0243**	**2.2537**	**0.0225**	**2.2762**	**0.6062**	**0.0212**	**0.6274**		**2,579.8027**	**2,579.8027**	**0.0600**	**0.2057**	**2,642.5893**

3.4 Building Construction - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0533	2.4736	0.7389	0.0106	0.3725	0.0144	0.3869	0.1073	0.0138	0.1210		1,136.9550	1,136.9550	0.0239	0.1681	1,187.6312
Worker	0.5323	0.3214	4.3616	0.0137	1.8812	8.1000e-003	1.8893	0.4990	7.4600e-003	0.5064		1,442.8477	1,442.8477	0.0361	0.0376	1,454.9582
Total	**0.5855**	**2.7950**	**5.1005**	**0.0243**	**2.2537**	**0.0225**	**2.2762**	**0.6062**	**0.0212**	**0.6274**		**2,579.8027**	**2,579.8027**	**0.0600**	**0.2057**	**2,642.5893**

3.4 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0521	2.4563	0.7296	0.0104	0.3725	0.0143	0.3868	0.1073	0.0136	0.1209		1,114.0545	1,114.0545	0.0237	0.1646	1,163.6950
Worker	0.5053	0.2950	4.1517	0.0133	1.8812	7.6400e-003	1.8888	0.4990	7.0300e-003	0.5060		1,412.4252	1,412.4252	0.0332	0.0358	1,423.9181
Total	**0.5575**	**2.7513**	**4.8813**	**0.0237**	**2.2537**	**0.0219**	**2.2756**	**0.6062**	**0.0207**	**0.6269**		**2,526.4797**	**2,526.4797**	**0.0569**	**0.2004**	**2,587.6131**

3.4 Building Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0521	2.4563	0.7296	0.0104	0.3725	0.0143	0.3868	0.1073	0.0136	0.1209		1,114.0545	1,114.0545	0.0237	0.1646	1,163.6950
Worker	0.5053	0.2950	4.1517	0.0133	1.8812	7.6400e-003	1.8888	0.4990	7.0300e-003	0.5060		1,412.4252	1,412.4252	0.0332	0.0358	1,423.9181
Total	**0.5575**	**2.7513**	**4.8813**	**0.0237**	**2.2537**	**0.0219**	**2.2756**	**0.6062**	**0.0207**	**0.6269**		**2,526.4797**	**2,526.4797**	**0.0569**	**0.2004**	**2,587.6131**

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.547 2	2,207.547 2	0.7140		2,225.396 3
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.547 2**	**2,207.547 2**	**0.7140**		**2,225.396 3**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0390	0.0257	0.3212	9.6000e-004	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		99.0731	99.0731	2.8400e-003	2.7800e-003	99.9731
Total	**0.0390**	**0.0257**	**0.3212**	**9.6000e-004**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**99.0731**	**99.0731**	**2.8400e-003**	**2.7800e-003**	**99.9731**

3.5 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310	0.0000	2,207.547 2	2,207.547 2	0.7140		2,225.396 3
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**	**0.0000**	**2,207.547 2**	**2,207.547 2**	**0.7140**		**2,225.396 3**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0390	0.0257	0.3212	9.6000e-004	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		99.0731	99.0731	2.8400e-003	2.7800e-003	99.9731
Total	**0.0390**	**0.0257**	**0.3212**	**9.6000e-004**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**99.0731**	**99.0731**	**2.8400e-003**	**2.7800e-003**	**99.9731**

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.745 2	2,206.745 2	0.7137		2,224.587 8
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.745 2**	**2,206.745 2**	**0.7137**		**2,224.587 8**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0368	0.0231	0.3019	9.3000e-004	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		96.7068	96.7068	2.5900e-003	2.6100e-003	97.5484
Total	**0.0368**	**0.0231**	**0.3019**	**9.3000e-004**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**96.7068**	**96.7068**	**2.5900e-003**	**2.6100e-003**	**97.5484**

3.5 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850	0.0000	2,206.745 2	2,206.745 2	0.7137		2,224.587 8
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**	**0.0000**	**2,206.745 2**	**2,206.745 2**	**0.7137**		**2,224.587 8**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0368	0.0231	0.3019	9.3000e-004	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		96.7068	96.7068	2.5900e-003	2.6100e-003	97.5484
Total	**0.0368**	**0.0231**	**0.3019**	**9.3000e-004**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**96.7068**	**96.7068**	**2.5900e-003**	**2.6100e-003**	**97.5484**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1128	0.0709	0.9258	2.8500e-003	0.3779	1.7100e-003	0.3796	0.1002	1.5700e-003	0.1018		296.5676	296.5676	7.9300e-003	7.9900e-003	299.1483
Total	**0.1128**	**0.0709**	**0.9258**	**2.8500e-003**	**0.3779**	**1.7100e-003**	**0.3796**	**0.1002**	**1.5700e-003**	**0.1018**		**296.5676**	**296.5676**	**7.9300e-003**	**7.9900e-003**	**299.1483**

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1128	0.0709	0.9258	2.8500e-003	0.3779	1.7100e-003	0.3796	0.1002	1.5700e-003	0.1018		296.5676	296.5676	7.9300e-003	7.9900e-003	299.1483
Total	**0.1128**	**0.0709**	**0.9258**	**2.8500e-003**	**0.3779**	**1.7100e-003**	**0.3796**	**0.1002**	**1.5700e-003**	**0.1018**		**296.5676**	**296.5676**	**7.9300e-003**	**7.9900e-003**	**299.1483**

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1069	0.0646	0.8761	2.7600e-003	0.3779	1.6300e-003	0.3795	0.1002	1.5000e-003	0.1017		289.8297	289.8297	7.2500e-003	7.5500e-003	292.2623
Total	**0.1069**	**0.0646**	**0.8761**	**2.7600e-003**	**0.3779**	**1.6300e-003**	**0.3795**	**0.1002**	**1.5000e-003**	**0.1017**		**289.8297**	**289.8297**	**7.2500e-003**	**7.5500e-003**	**292.2623**

3.6 Architectural Coating - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1069	0.0646	0.8761	2.7600e-003	0.3779	1.6300e-003	0.3795	0.1002	1.5000e-003	0.1017		289.8297	289.8297	7.2500e-003	7.5500e-003	292.2623
Total	**0.1069**	**0.0646**	**0.8761**	**2.7600e-003**	**0.3779**	**1.6300e-003**	**0.3795**	**0.1002**	**1.5000e-003**	**0.1017**		**289.8297**	**289.8297**	**7.2500e-003**	**7.5500e-003**	**292.2623**

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1015	0.0593	0.8340	2.6800e-003	0.3779	1.5400e-003	0.3794	0.1002	1.4100e-003	0.1016		283.7186	283.7186	6.6700e-003	7.1900e-003	286.0272
Total	**0.1015**	**0.0593**	**0.8340**	**2.6800e-003**	**0.3779**	**1.5400e-003**	**0.3794**	**0.1002**	**1.4100e-003**	**0.1016**		**283.7186**	**283.7186**	**6.6700e-003**	**7.1900e-003**	**286.0272**

3.6 Architectural Coating - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1015	0.0593	0.8340	2.6800e-003	0.3779	1.5400e-003	0.3794	0.1002	1.4100e-003	0.1016		283.7186	283.7186	6.6700e-003	7.1900e-003	286.0272
Total	**0.1015**	**0.0593**	**0.8340**	**2.6800e-003**	**0.3779**	**1.5400e-003**	**0.3794**	**0.1002**	**1.4100e-003**	**0.1016**		**283.7186**	**283.7186**	**6.6700e-003**	**7.1900e-003**	**286.0272**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	9.1482	10.2839	89.6943	0.1706	20.8128	0.1249	20.9377	5.5436	0.1164	5.6600		18,019.06 41	18,019.06 41	1.2503	0.9024	18,319.22 14
Unmitigated	9.2333	10.4353	90.9522	0.1739	21.2375	0.1271	21.3647	5.6568	0.1184	5.7752		18,373.57 22	18,373.57 22	1.2648	0.9155	18,678.00 59

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	390.00	390.00	390.00	900,747	882,732
Regional Shopping Center	1,510.00	1,510.00	1510.00	2,647,490	2,594,540
Single Family Housing	2,832.00	2,832.00	2832.00	6,540,808	6,409,992
Total	4,732.00	4,732.00	4,732.00	10,089,045	9,887,264

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Congregate Care (Assisted	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724
NaturalGas Unmitigated	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3444.53	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Regional Shopping Center	256.438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	21887.3	0.2360	2.0171	0.8583	0.0129		0.1631	0.1631		0.1631	0.1631		2,574.9757	2,574.9757	0.0494	0.0472	2,590.2775
Total		**0.2760**	**2.3596**	**1.0145**	**0.0151**		**0.1907**	**0.1907**		**0.1907**	**0.1907**		**3,010.3832**	**3,010.3832**	**0.0577**	**0.0552**	**3,028.2725**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3.44453	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Regional Shopping Center	0.256438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	21.8873	0.2360	2.0171	0.8583	0.0129		0.1631	0.1631		0.1631	0.1631		2,574.9757	2,574.9757	0.0494	0.0472	2,590.2775
Total		**0.2760**	**2.3596**	**1.0145**	**0.0151**		**0.1907**	**0.1907**		**0.1907**	**0.1907**		**3,010.3832**	**3,010.3832**	**0.0577**	**0.0552**	**3,028.2725**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	20.0825	5.3042	39.1698	0.0331		0.6001	0.6001		0.6001	0.6001	0.0000	6,292.7396	6,292.7396	0.1834	0.1141	6,331.3379
Unmitigated	392.0960	7.7772	520.6844	0.9162		68.6335	68.6335		68.6335	68.6335	7,369.1285	2,475.6808	9,844.8093	9.3414	0.5201	10,233.3463

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.6220					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	372.5843	7.3499	483.5900	0.9143		68.4277	68.4277		68.4277	68.4277	7,369.1285	2,408.8235	9,777.9520	9.2773	0.5201	10,164.8881
Landscaping	1.1140	0.4273	37.0945	1.9600e-003		0.2058	0.2058		0.2058	0.2058		66.8573	66.8573	0.0640		68.4582
Total	**392.0960**	**7.7772**	**520.6845**	**0.9162**		**68.6335**	**68.6335**		**68.6335**	**68.6335**	**7,369.1285**	**2,475.6808**	**9,844.8093**	**9.3414**	**0.5201**	**10,233.3463**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.6220					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.5707	4.8769	2.0753	0.0311		0.3943	0.3943		0.3943	0.3943	0.0000	6,225.882 4	6,225.882 4	0.1193	0.1141	6,262.879 7
Landscaping	1.1140	0.4273	37.0945	1.9600e-003		0.2058	0.2058		0.2058	0.2058		66.8573	66.8573	0.0640		68.4582
Total	**20.0825**	**5.3042**	**39.1698**	**0.0331**		**0.6001**	**0.6001**		**0.6001**	**0.6001**	**0.0000**	**6,292.739 6**	**6,292.739 6**	**0.1834**	**0.1141**	**6,331.337 9**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch Project

Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Congregate Care (Assisted Living)	150.00	Dwelling Unit	9.38	150,000.00	429
Single Family Housing	300.00	Dwelling Unit	37.10	540,000.00	858
Regional Shopping Center	40.00	1000sqft	0.92	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site plan.

Construction Phase - Grading phase updating per project-specific info, and architectural coating phase set to occur concurrently with building construction.

Grading - Material export updated.

Vehicle Trips - Trip rates updated to match project-specific traffic report.

Mobile Land Use Mitigation - Project would improve pedestrian network.

Area Mitigation - Only natural gas hearths installed.

Water Mitigation - Water conservation strategy applied, per AQ Questionnaire.

Construction Off-road Equipment Mitigation - Graders, Scrapers and Rubber Tired Dozers mitigated.

Mitigated

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	55.00	740.00
tblConstructionPhase	NumDays	75.00	120.00
tblGrading	MaterialExported	0.00	300,000.00
tblLandUse	LotAcreage	97.40	37.10
tblVehicleTrips	ST_TR	2.93	2.60
tblVehicleTrips	ST_TR	46.12	37.75
tblVehicleTrips	ST_TR	9.54	9.44
tblVehicleTrips	SU_TR	3.15	2.60
tblVehicleTrips	SU_TR	21.10	37.75
tblVehicleTrips	SU_TR	8.55	9.44

2.0 Emissions Summary

Mitigated

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.2995	5.1212	2.9213	0.0161	1.1955	0.1304	1.3259	0.4644	0.1207	0.5851	0.0000	1,536.9502	1,536.9502	0.1744	0.1749	1,593.4228
2025	1.9459	2.1080	3.0793	7.3900e-003	0.3192	0.0778	0.3970	0.0860	0.0735	0.1595	0.0000	669.3034	669.3034	0.0811	0.0248	678.7124
2026	2.0710	2.1390	3.0900	7.4600e-003	0.3307	0.0787	0.4094	0.0891	0.0744	0.1635	0.0000	677.2395	677.2395	0.0806	0.0249	686.6764
2027	1.8595	1.8530	2.6599	6.4100e-003	0.2882	0.0683	0.3565	0.0776	0.0647	0.1423	0.0000	582.8731	582.8731	0.0695	0.0210	590.8786
Maximum	**2.0710**	**5.1212**	**3.0900**	**0.0161**	**1.1955**	**0.1304**	**1.3259**	**0.4644**	**0.1207**	**0.5851**	**0.0000**	**1,536.9502**	**1,536.9502**	**0.1744**	**0.1749**	**1,593.4228**

Mitigated

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.1523	3.3656	3.1783	0.0161	1.1955	0.0572	1.2527	0.4644	0.0538	0.5182	0.0000	1,536.9497	1,536.9497	0.1744	0.1749	1,593.4223
2025	1.9459	2.1080	3.0793	7.3900e-003	0.3192	0.0778	0.3970	0.0860	0.0735	0.1595	0.0000	669.3030	669.3030	0.0811	0.0248	678.7120
2026	2.0710	2.1390	3.0900	7.4600e-003	0.3307	0.0787	0.4094	0.0891	0.0744	0.1635	0.0000	677.2391	677.2391	0.0806	0.0249	686.6760
2027	1.8595	1.8530	2.6599	6.4100e-003	0.2882	0.0683	0.3565	0.0776	0.0647	0.1423	0.0000	582.8727	582.8727	0.0695	0.0210	590.8782
Maximum	**2.0710**	**3.3656**	**3.1783**	**0.0161**	**1.1955**	**0.0787**	**1.2527**	**0.4644**	**0.0744**	**0.5182**	**0.0000**	**1,536.9497**	**1,536.9497**	**0.1744**	**0.1749**	**1,593.4223**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**2.38**	**15.65**	**-2.19**	**0.00**	**0.00**	**20.61**	**2.94**	**0.00**	**20.09**	**6.37**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**4-1-2024**	**6-30-2024**	1.8334	1.0436
2	**7-1-2024**	**9-30-2024**	2.5366	1.6736
3	**10-1-2024**	**12-31-2024**	0.9632	0.7286
4	**1-1-2025**	**3-31-2025**	0.8863	0.8863
5	**4-1-2025**	**6-30-2025**	1.0481	1.0481
6	**7-1-2025**	**9-30-2025**	1.0596	1.0596
7	**10-1-2025**	**12-31-2025**	1.0674	1.0674
8	**1-1-2026**	**3-31-2026**	1.0413	1.0413

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

9	**4-1-2026**	**6-30-2026**	1.0454	1.0454
10	**7-1-2026**	**9-30-2026**	1.0569	1.0569
11	**10-1-2026**	**12-31-2026**	1.0645	1.0645
12	**1-1-2027**	**3-31-2027**	1.0387	1.0387
13	**4-1-2027**	**6-30-2027**	1.0430	1.0430
14	**7-1-2027**	**9-30-2027**	1.0544	1.0544
		Highest	2.5366	1.6736

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.5721	0.0852	6.3862	6.4200e-003		0.4574	0.4574		0.4574	0.4574	44.9718	17.6305	62.6023	0.0883	2.6300e-003	65.5922
Energy	0.0504	0.4306	0.1852	2.7500e-003		0.0348	0.0348		0.0348	0.0348	0.0000	807.9438	807.9438	0.0596	0.0152	813.9664
Mobile	1.6851	1.7977	15.4637	0.0318	3.7191	0.0231	3.7422	0.9937	0.0215	1.0152	0.0000	3,047.6346	3,047.6346	0.1972	0.1455	3,095.9181
Waste						0.0000	0.0000		0.0000	0.0000	109.4609	0.0000	109.4609	6.4690	0.0000	271.1846
Water						0.0000	0.0000		0.0000	0.0000	10.2417	22.7357	32.9774	1.0556	0.0253	66.9019
Total	**7.3076**	**2.3135**	**22.0351**	**0.0410**	**3.7191**	**0.5153**	**4.2344**	**0.9937**	**0.5138**	**1.5074**	**164.6743**	**3,895.9447**	**4,060.6189**	**7.8696**	**0.1886**	**4,313.5632**

Mitigated

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.4610	0.0656	3.3501	3.5000e-004		0.0207	0.0207		0.0207	0.0207	0.0000	36.9182	36.9182	5.8300e-003	5.8000e-004	37.2358
Energy	0.0504	0.4306	0.1852	2.7500e-003		0.0348	0.0348		0.0348	0.0348	0.0000	807.9438	807.9438	0.0596	0.0152	813.9664
Mobile	1.6700	1.7715	15.2422	0.0312	3.6447	0.0227	3.6674	0.9738	0.0212	0.9949	0.0000	2,988.7908	2,988.7908	0.1949	0.1434	3,036.3895
Waste						0.0000	0.0000		0.0000	0.0000	109.4609	0.0000	109.4609	6.4690	0.0000	271.1846
Water						0.0000	0.0000		0.0000	0.0000	9.2175	20.4622	29.6797	0.9500	0.0228	60.2117
Total	**5.1814**	**2.2677**	**18.7774**	**0.0343**	**3.6447**	**0.0782**	**3.7229**	**0.9738**	**0.0767**	**1.0504**	**118.6783**	**3,854.1150**	**3,972.7933**	**7.6793**	**0.1819**	**4,218.9880**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**29.10**	**1.98**	**14.78**	**16.30**	**2.00**	**84.82**	**12.08**	**2.00**	**85.08**	**30.31**	**27.93**	**1.07**	**2.16**	**2.42**	**3.54**	**2.19**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/10/2024	5	30	
2	Grading	Grading	5/11/2024	10/25/2024	5	120	
3	Paving	Paving	10/26/2024	1/10/2025	5	55	

Mitigated

4	Building Construction	Building Construction	1/11/2025	11/12/2027	5	740	
5	Architectural Coating	Architectural Coating	1/25/2025	11/26/2027	5	740	

Acres of Grading (Site Preparation Phase): 45

Acres of Grading (Grading Phase): 360

Acres of Paving: 0

Residential Indoor: 1,397,250; Residential Outdoor: 465,750; Non-Residential Indoor: 60,000; Non-Residential Outdoor: 20,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	229.00	55.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2949	0.0000	0.2949	0.1515	0.0000	0.1515	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0399	0.4076	0.2750	5.7000e-004		0.0184	0.0184		0.0170	0.0170	0.0000	50.1856	50.1856	0.0162	0.0000	50.5914
Total	**0.0399**	**0.4076**	**0.2750**	**5.7000e-004**	**0.2949**	**0.0184**	**0.3133**	**0.1515**	**0.0170**	**0.1685**	**0.0000**	**50.1856**	**50.1856**	**0.0162**	**0.0000**	**50.5914**

Mitigated

3.2 Site Preparation - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	4.2000e-004	5.5900e-003	2.0000e-005	2.1300e-003	1.0000e-005	2.1400e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.6309	1.6309	4.0000e-005	4.0000e-005	1.6447
Total	**6.5000e-004**	**4.2000e-004**	**5.5900e-003**	**2.0000e-005**	**2.1300e-003**	**1.0000e-005**	**2.1400e-003**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**1.6309**	**1.6309**	**4.0000e-005**	**4.0000e-005**	**1.6447**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2949	0.0000	0.2949	0.1515	0.0000	0.1515	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0133	0.1073	0.3067	5.7000e-004		4.6200e-003	4.6200e-003		4.3000e-003	4.3000e-003	0.0000	50.1855	50.1855	0.0162	0.0000	50.5913
Total	**0.0133**	**0.1073**	**0.3067**	**5.7000e-004**	**0.2949**	**4.6200e-003**	**0.2995**	**0.1515**	**4.3000e-003**	**0.1558**	**0.0000**	**50.1855**	**50.1855**	**0.0162**	**0.0000**	**50.5913**

Mitigated

3.2 Site Preparation - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	4.2000e-004	5.5900e-003	2.0000e-005	2.1300e-003	1.0000e-005	2.1400e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.6309	1.6309	4.0000e-005	4.0000e-005	1.6447
Total	**6.5000e-004**	**4.2000e-004**	**5.5900e-003**	**2.0000e-005**	**2.1300e-003**	**1.0000e-005**	**2.1400e-003**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**1.6309**	**1.6309**	**4.0000e-005**	**4.0000e-005**	**1.6447**

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5692	0.0000	0.5692	0.2218	0.0000	0.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1931	1.9426	1.6634	3.7200e-003		0.0801	0.0801		0.0737	0.0737	0.0000	327.1171	327.1171	0.1058	0.0000	329.7621
Total	**0.1931**	**1.9426**	**1.6634**	**3.7200e-003**	**0.5692**	**0.0801**	**0.6493**	**0.2218**	**0.0737**	**0.2955**	**0.0000**	**327.1171**	**327.1171**	**0.1058**	**0.0000**	**329.7621**

Mitigated

3.3 Grading - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0390	2.5443	0.6014	0.0111	0.3171	0.0207	0.3379	0.0872	0.0199	0.1071	0.0000	1,101.576 8	1,101.576 8	0.0368	0.1746	1,154.524 8
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	1.8800e-003	0.0249	8.0000e-005	9.4800e-003	5.0000e-005	9.5300e-003	2.5200e-003	4.0000e-005	2.5700e-003	0.0000	7.2483	7.2483	1.9000e-004	1.9000e-004	7.3098
Total	**0.0418**	**2.5461**	**0.6263**	**0.0112**	**0.3266**	**0.0208**	**0.3474**	**0.0898**	**0.0199**	**0.1097**	**0.0000**	**1,108.825 1**	**1,108.825 1**	**0.0370**	**0.1748**	**1,161.834 6**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5692	0.0000	0.5692	0.2218	0.0000	0.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0724	0.4874	1.8888	3.7200e-003		0.0207	0.0207		0.0194	0.0194	0.0000	327.1168	327.1168	0.1058	0.0000	329.7617
Total	**0.0724**	**0.4874**	**1.8888**	**3.7200e-003**	**0.5692**	**0.0207**	**0.5899**	**0.2218**	**0.0194**	**0.2412**	**0.0000**	**327.1168**	**327.1168**	**0.1058**	**0.0000**	**329.7617**

Mitigated

3.3 Grading - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0390	2.5443	0.6014	0.0111	0.3171	0.0207	0.3379	0.0872	0.0199	0.1071	0.0000	1,101.5768	1,101.5768	0.0368	0.1746	1,154.5248
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	1.8800e-003	0.0249	8.0000e-005	9.4800e-003	5.0000e-005	9.5300e-003	2.5200e-003	4.0000e-005	2.5700e-003	0.0000	7.2483	7.2483	1.9000e-004	1.9000e-004	7.3098
Total	**0.0418**	**2.5461**	**0.6263**	**0.0112**	**0.3266**	**0.0208**	**0.3474**	**0.0898**	**0.0199**	**0.1097**	**0.0000**	**1,108.8251**	**1,108.8251**	**0.0370**	**0.1748**	**1,161.8346**

3.4 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0232	0.2238	0.3437	5.4000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	47.0624	47.0624	0.0152	0.0000	47.4429
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0232**	**0.2238**	**0.3437**	**5.4000e-004**		**0.0110**	**0.0110**		**0.0101**	**0.0101**	**0.0000**	**47.0624**	**47.0624**	**0.0152**	**0.0000**	**47.4429**

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.4000e-004	5.5000e-004	7.3000e-003	2.0000e-005	2.7900e-003	1.0000e-005	2.8000e-003	7.4000e-004	1.0000e-005	7.5000e-004	0.0000	2.1292	2.1292	6.0000e-005	6.0000e-005	2.1472
Total	**8.4000e-004**	**5.5000e-004**	**7.3000e-003**	**2.0000e-005**	**2.7900e-003**	**1.0000e-005**	**2.8000e-003**	**7.4000e-004**	**1.0000e-005**	**7.5000e-004**	**0.0000**	**2.1292**	**2.1292**	**6.0000e-005**	**6.0000e-005**	**2.1472**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0232	0.2238	0.3437	5.4000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	47.0623	47.0623	0.0152	0.0000	47.4428
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0232**	**0.2238**	**0.3437**	**5.4000e-004**		**0.0110**	**0.0110**		**0.0101**	**0.0101**	**0.0000**	**47.0623**	**47.0623**	**0.0152**	**0.0000**	**47.4428**

Mitigated

3.4 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.4000e-004	5.5000e-004	7.3000e-003	2.0000e-005	2.7900e-003	1.0000e-005	2.8000e-003	7.4000e-004	1.0000e-005	7.5000e-004	0.0000	2.1292	2.1292	6.0000e-005	6.0000e-005	2.1472
Total	**8.4000e-004**	**5.5000e-004**	**7.3000e-003**	**2.0000e-005**	**2.7900e-003**	**1.0000e-005**	**2.8000e-003**	**7.4000e-004**	**1.0000e-005**	**7.5000e-004**	**0.0000**	**2.1292**	**2.1292**	**6.0000e-005**	**6.0000e-005**	**2.1472**

3.4 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6600e-003	0.0343	0.0583	9.0000e-005		1.6700e-003	1.6700e-003		1.5400e-003	1.5400e-003	0.0000	8.0077	8.0077	2.5900e-003	0.0000	8.0725
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.6600e-003**	**0.0343**	**0.0583**	**9.0000e-005**		**1.6700e-003**	**1.6700e-003**		**1.5400e-003**	**1.5400e-003**	**0.0000**	**8.0077**	**8.0077**	**2.5900e-003**	**0.0000**	**8.0725**

Mitigated

3.4 Paving - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	8.0000e-005	1.1700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3538	0.3538	1.0000e-005	1.0000e-005	0.3566
Total	**1.4000e-004**	**8.0000e-005**	**1.1700e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.3538**	**0.3538**	**1.0000e-005**	**1.0000e-005**	**0.3566**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6600e-003	0.0343	0.0583	9.0000e-005		1.6700e-003	1.6700e-003		1.5400e-003	1.5400e-003	0.0000	8.0077	8.0077	2.5900e-003	0.0000	8.0724
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.6600e-003**	**0.0343**	**0.0583**	**9.0000e-005**		**1.6700e-003**	**1.6700e-003**		**1.5400e-003**	**1.5400e-003**	**0.0000**	**8.0077**	**8.0077**	**2.5900e-003**	**0.0000**	**8.0724**

Mitigated

3.4 Paving - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	8.0000e-005	1.1700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3538	0.3538	1.0000e-005	1.0000e-005	0.3566
Total	**1.4000e-004**	**8.0000e-005**	**1.1700e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.3538**	**0.3538**	**1.0000e-005**	**1.0000e-005**	**0.3566**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1730	1.5774	2.0347	3.4100e-003		0.0667	0.0667		0.0628	0.0628	0.0000	293.3781	293.3781	0.0690	0.0000	295.1022
Total	**0.1730**	**1.5774**	**2.0347**	**3.4100e-003**		**0.0667**	**0.0667**		**0.0628**	**0.0628**	**0.0000**	**293.3781**	**293.3781**	**0.0690**	**0.0000**	**295.1022**

3.5 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0200e-003	0.3083	0.0931	1.3600e-003	0.0457	1.8200e-003	0.0475	0.0132	1.7400e-003	0.0150	0.0000	132.7934	132.7934	2.7700e-003	0.0196	138.7130
Worker	0.0653	0.0408	0.5635	1.8100e-003	0.2289	1.0800e-003	0.2300	0.0609	9.9000e-004	0.0619	0.0000	170.7961	170.7961	4.2500e-003	4.3000e-003	172.1838
Total	**0.0723**	**0.3491**	**0.6566**	**3.1700e-003**	**0.2746**	**2.9000e-003**	**0.2775**	**0.0741**	**2.7300e-003**	**0.0768**	**0.0000**	**303.5895**	**303.5895**	**7.0200e-003**	**0.0239**	**310.8967**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1730	1.5774	2.0347	3.4100e-003		0.0667	0.0667		0.0628	0.0628	0.0000	293.3778	293.3778	0.0690	0.0000	295.1019
Total	**0.1730**	**1.5774**	**2.0347**	**3.4100e-003**		**0.0667**	**0.0667**		**0.0628**	**0.0628**	**0.0000**	**293.3778**	**293.3778**	**0.0690**	**0.0000**	**295.1019**

Mitigated

3.5 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0200e-003	0.3083	0.0931	1.3600e-003	0.0457	1.8200e-003	0.0475	0.0132	1.7400e-003	0.0150	0.0000	132.7934	132.7934	2.7700e-003	0.0196	138.7130
Worker	0.0653	0.0408	0.5635	1.8100e-003	0.2289	1.0800e-003	0.2300	0.0609	9.9000e-004	0.0619	0.0000	170.7961	170.7961	4.2500e-003	4.3000e-003	172.1838
Total	**0.0723**	**0.3491**	**0.6566**	**3.1700e-003**	**0.2746**	**2.9000e-003**	**0.2775**	**0.0741**	**2.7300e-003**	**0.0768**	**0.0000**	**303.5895**	**303.5895**	**7.0200e-003**	**0.0239**	**310.8967**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.5 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0800e-003	0.3162	0.0947	1.3800e-003	0.0471	1.8700e-003	0.0490	0.0136	1.7900e-003	0.0154	0.0000	134.4828	134.4828	2.8400e-003	0.0199	140.4751
Worker	0.0637	0.0384	0.5498	1.8100e-003	0.2361	1.0600e-003	0.2372	0.0628	9.7000e-004	0.0638	0.0000	172.1929	172.1929	4.0100e-003	4.1900e-003	173.5423
Total	**0.0708**	**0.3546**	**0.6445**	**3.1900e-003**	**0.2832**	**2.9300e-003**	**0.2862**	**0.0764**	**2.7600e-003**	**0.0792**	**0.0000**	**306.6757**	**306.6757**	**6.8500e-003**	**0.0241**	**314.0175**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

Mitigated

3.5 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0800e-003	0.3162	0.0947	1.3800e-003	0.0471	1.8700e-003	0.0490	0.0136	1.7900e-003	0.0154	0.0000	134.4828	134.4828	2.8400e-003	0.0199	140.4751
Worker	0.0637	0.0384	0.5498	1.8100e-003	0.2361	1.0600e-003	0.2372	0.0628	9.7000e-004	0.0638	0.0000	172.1929	172.1929	4.0100e-003	4.1900e-003	173.5423
Total	**0.0708**	**0.3546**	**0.6445**	**3.1900e-003**	**0.2832**	**2.9300e-003**	**0.2862**	**0.0764**	**2.7600e-003**	**0.0792**	**0.0000**	**306.6757**	**306.6757**	**6.8500e-003**	**0.0241**	**314.0175**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1545	1.4091	1.8176	3.0500e-003		0.0596	0.0596		0.0561	0.0561	0.0000	262.0690	262.0690	0.0616	0.0000	263.6091
Total	**0.1545**	**1.4091**	**1.8176**	**3.0500e-003**		**0.0596**	**0.0596**		**0.0561**	**0.0561**	**0.0000**	**262.0690**	**262.0690**	**0.0616**	**0.0000**	**263.6091**

Mitigated

3.5 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0100e-003	0.2719	0.0809	1.1700e-003	0.0408	1.6100e-003	0.0424	0.0118	1.5400e-003	0.0133	0.0000	114.1016	114.1016	2.4400e-003	0.0169	119.1842
Worker	0.0523	0.0305	0.4529	1.5200e-003	0.2045	8.6000e-004	0.2053	0.0544	7.9000e-004	0.0552	0.0000	145.9578	145.9578	3.1900e-003	3.4500e-003	147.0668
Total	**0.0583**	**0.3024**	**0.5338**	**2.6900e-003**	**0.2453**	**2.4700e-003**	**0.2477**	**0.0662**	**2.3300e-003**	**0.0685**	**0.0000**	**260.0594**	**260.0594**	**5.6300e-003**	**0.0203**	**266.2510**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1545	1.4091	1.8176	3.0500e-003		0.0596	0.0596		0.0561	0.0561	0.0000	262.0687	262.0687	0.0616	0.0000	263.6088
Total	**0.1545**	**1.4091**	**1.8176**	**3.0500e-003**		**0.0596**	**0.0596**		**0.0561**	**0.0561**	**0.0000**	**262.0687**	**262.0687**	**0.0616**	**0.0000**	**263.6088**

Mitigated

3.5 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0100e-003	0.2719	0.0809	1.1700e-003	0.0408	1.6100e-003	0.0424	0.0118	1.5400e-003	0.0133	0.0000	114.1016	114.1016	2.4400e-003	0.0169	119.1842
Worker	0.0523	0.0305	0.4529	1.5200e-003	0.2045	8.6000e-004	0.2053	0.0544	7.9000e-004	0.0552	0.0000	145.9578	145.9578	3.1900e-003	3.4500e-003	147.0668
Total	**0.0583**	**0.3024**	**0.5338**	**2.6900e-003**	**0.2453**	**2.4700e-003**	**0.2477**	**0.0662**	**2.3300e-003**	**0.0685**	**0.0000**	**260.0594**	**260.0594**	**5.6300e-003**	**0.0203**	**266.2510**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.6635					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.1392	0.2198	3.6000e-004		6.2600e-003	6.2600e-003		6.2600e-003	6.2600e-003	0.0000	31.0220	31.0220	1.6900e-003	0.0000	31.0643
Total	**1.6843**	**0.1392**	**0.2198**	**3.6000e-004**		**6.2600e-003**	**6.2600e-003**		**6.2600e-003**	**6.2600e-003**	**0.0000**	**31.0220**	**31.0220**	**1.6900e-003**	**0.0000**	**31.0643**

Mitigated

3.6 Architectural Coating - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0126	7.8800e-003	0.1087	3.5000e-004	0.0442	2.1000e-004	0.0444	0.0118	1.9000e-004	0.0119	0.0000	32.9523	32.9523	8.2000e-004	8.3000e-004	33.2201
Total	**0.0126**	**7.8800e-003**	**0.1087**	**3.5000e-004**	**0.0442**	**2.1000e-004**	**0.0444**	**0.0118**	**1.9000e-004**	**0.0119**	**0.0000**	**32.9523**	**32.9523**	**8.2000e-004**	**8.3000e-004**	**33.2201**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.6635					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.1392	0.2198	3.6000e-004		6.2600e-003	6.2600e-003		6.2600e-003	6.2600e-003	0.0000	31.0220	31.0220	1.6900e-003	0.0000	31.0643
Total	**1.6843**	**0.1392**	**0.2198**	**3.6000e-004**		**6.2600e-003**	**6.2600e-003**		**6.2600e-003**	**6.2600e-003**	**0.0000**	**31.0220**	**31.0220**	**1.6900e-003**	**0.0000**	**31.0643**

Mitigated

3.6 Architectural Coating - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0126	7.8800e-003	0.1087	3.5000e-004	0.0442	2.1000e-004	0.0444	0.0118	1.9000e-004	0.0119	0.0000	32.9523	32.9523	8.2000e-004	8.3000e-004	33.2201
Total	**0.0126**	**7.8800e-003**	**0.1087**	**3.5000e-004**	**0.0442**	**2.1000e-004**	**0.0444**	**0.0118**	**1.9000e-004**	**0.0119**	**0.0000**	**32.9523**	**32.9523**	**8.2000e-004**	**8.3000e-004**	**33.2201**

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.7867					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3200	33.3200	1.8200e-003	0.0000	33.3654
Total	**1.8090**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3200**	**33.3200**	**1.8200e-003**	**0.0000**	**33.3654**

Mitigated

3.6 Architectural Coating - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0128	7.7000e-003	0.1104	3.6000e-004	0.0474	2.1000e-004	0.0477	0.0126	2.0000e-004	0.0128	0.0000	34.5890	34.5890	8.0000e-004	8.4000e-004	34.8600
Total	**0.0128**	**7.7000e-003**	**0.1104**	**3.6000e-004**	**0.0474**	**2.1000e-004**	**0.0477**	**0.0126**	**2.0000e-004**	**0.0128**	**0.0000**	**34.5890**	**34.5890**	**8.0000e-004**	**8.4000e-004**	**34.8600**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.7867					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3199	33.3199	1.8200e-003	0.0000	33.3654
Total	**1.8090**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3199**	**33.3199**	**1.8200e-003**	**0.0000**	**33.3654**

Mitigated

3.6 Architectural Coating - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0128	7.7000e-003	0.1104	3.6000e-004	0.0474	2.1000e-004	0.0477	0.0126	2.0000e-004	0.0128	0.0000	34.5890	34.5890	8.0000e-004	8.4000e-004	34.8600
Total	**0.0128**	**7.7000e-003**	**0.1104**	**3.6000e-004**	**0.0474**	**2.1000e-004**	**0.0477**	**0.0126**	**2.0000e-004**	**0.0128**	**0.0000**	**34.5890**	**34.5890**	**8.0000e-004**	**8.4000e-004**	**34.8600**

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.6156					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0202	0.1352	0.2135	3.5000e-004		6.0800e-003	6.0800e-003		6.0800e-003	6.0800e-003	0.0000	30.1284	30.1284	1.6400e-003	0.0000	30.1695
Total	**1.6357**	**0.1352**	**0.2135**	**3.5000e-004**		**6.0800e-003**	**6.0800e-003**		**6.0800e-003**	**6.0800e-003**	**0.0000**	**30.1284**	**30.1284**	**1.6400e-003**	**0.0000**	**30.1695**

Mitigated

3.6 Architectural Coating - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0110	6.3900e-003	0.0950	3.2000e-004	0.0429	1.8000e-004	0.0431	0.0114	1.7000e-004	0.0116	0.0000	30.6163	30.6163	6.7000e-004	7.2000e-004	30.8490
Total	**0.0110**	**6.3900e-003**	**0.0950**	**3.2000e-004**	**0.0429**	**1.8000e-004**	**0.0431**	**0.0114**	**1.7000e-004**	**0.0116**	**0.0000**	**30.6163**	**30.6163**	**6.7000e-004**	**7.2000e-004**	**30.8490**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.6156					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0202	0.1352	0.2135	3.5000e-004		6.0800e-003	6.0800e-003		6.0800e-003	6.0800e-003	0.0000	30.1284	30.1284	1.6400e-003	0.0000	30.1694
Total	**1.6357**	**0.1352**	**0.2135**	**3.5000e-004**		**6.0800e-003**	**6.0800e-003**		**6.0800e-003**	**6.0800e-003**	**0.0000**	**30.1284**	**30.1284**	**1.6400e-003**	**0.0000**	**30.1694**

Mitigated

3.6 Architectural Coating - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0110	6.3900e-003	0.0950	3.2000e-004	0.0429	1.8000e-004	0.0431	0.0114	1.7000e-004	0.0116	0.0000	30.6163	30.6163	6.7000e-004	7.2000e-004	30.8490
Total	**0.0110**	**6.3900e-003**	**0.0950**	**3.2000e-004**	**0.0429**	**1.8000e-004**	**0.0431**	**0.0114**	**1.7000e-004**	**0.0116**	**0.0000**	**30.6163**	**30.6163**	**6.7000e-004**	**7.2000e-004**	**30.8490**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.6700	1.7715	15.2422	0.0312	3.6447	0.0227	3.6674	0.9738	0.0212	0.9949	0.0000	2,988.790 8	2,988.790 8	0.1949	0.1434	3,036.389 5
Unmitigated	1.6851	1.7977	15.4637	0.0318	3.7191	0.0231	3.7422	0.9937	0.0215	1.0152	0.0000	3,047.634 6	3,047.634 6	0.1972	0.1455	3,095.918 1

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	390.00	390.00	390.00	900,747	882,732
Regional Shopping Center	1,510.00	1,510.00	1510.00	2,647,490	2,594,540
Single Family Housing	2,832.00	2,832.00	2832.00	6,540,808	6,409,992
Total	4,732.00	4,732.00	4,732.00	10,089,045	9,887,264

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Congregate Care (Assisted	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	309.5411	309.5411	0.0501	6.0700e-003	312.6019
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	309.5411	309.5411	0.0501	6.0700e-003	312.6019
NaturalGas Mitigated	0.0504	0.4306	0.1852	2.7500e-003		0.0348	0.0348		0.0348	0.0348	0.0000	498.4027	498.4027	9.5500e-003	9.1400e-003	501.3645
NaturalGas Unmitigated	0.0504	0.4306	0.1852	2.7500e-003		0.0348	0.0348		0.0348	0.0348	0.0000	498.4027	498.4027	9.5500e-003	9.1400e-003	501.3645

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Congregate Care (Assisted Living)	1.25725e+006	6.7800e-003	0.0579	0.0247	3.7000e-004		4.6800e-003	4.6800e-003		4.6800e-003	4.6800e-003	0.0000	67.0918	67.0918	1.2900e-003	1.2300e-003	67.4905
Regional Shopping Center	93600	5.0000e-004	4.5900e-003	3.8500e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9949	4.9949	1.0000e-004	9.0000e-005	5.0245
Single Family Housing	7.98886e+006	0.0431	0.3681	0.1566	2.3500e-003		0.0298	0.0298		0.0298	0.0298	0.0000	426.3161	426.3161	8.1700e-003	7.8200e-003	428.8495
Total		**0.0504**	**0.4306**	**0.1851**	**2.7500e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**	**0.0000**	**498.4027**	**498.4027**	**9.5600e-003**	**9.1400e-003**	**501.3645**

Mitigated

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Congregate Care (Assisted Living)	1.25725e+006	6.7800e-003	0.0579	0.0247	3.7000e-004		4.6800e-003	4.6800e-003		4.6800e-003	4.6800e-003	0.0000	67.0918	67.0918	1.2900e-003	1.2300e-003	67.4905
Regional Shopping Center	93600	5.0000e-004	4.5900e-003	3.8500e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9949	4.9949	1.0000e-004	9.0000e-005	5.0245
Single Family Housing	7.98886e+006	0.0431	0.3681	0.1566	2.3500e-003		0.0298	0.0298		0.0298	0.0298	0.0000	426.3161	426.3161	8.1700e-003	7.8200e-003	428.8495
Total		**0.0504**	**0.4306**	**0.1851**	**2.7500e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**	**0.0000**	**498.4027**	**498.4027**	**9.5600e-003**	**9.1400e-003**	**501.3645**

Mitigated

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Congregate Care (Assisted Living)	579965	53.6605	8.6800e-003	1.0500e-003	54.1911
Regional Shopping Center	415600	38.4529	6.2200e-003	7.5000e-004	38.8331
Single Family Housing	2.34997e+006	217.4277	0.0352	4.2600e-003	219.5777
Total		**309.5411**	**0.0501**	**6.0600e-003**	**312.6019**

Mitigated

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Congregate Care (Assisted Living)	579965	53.6605	8.6800e-003	1.0500e-003	54.1911
Regional Shopping Center	415600	38.4529	6.2200e-003	7.5000e-004	38.8331
Single Family Housing	2.34997e+006	217.4277	0.0352	4.2600e-003	219.5777
Total		**309.5411**	**0.0501**	**6.0600e-003**	**312.6019**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.4610	0.0656	3.3501	3.5000e-004		0.0207	0.0207		0.0207	0.0207	0.0000	36.9182	36.9182	5.8300e-003	5.8000e-004	37.2358
Unmitigated	5.5721	0.0852	6.3862	6.4200e-003		0.4574	0.4574		0.4574	0.4574	44.9718	17.6305	62.6023	0.0883	2.6300e-003	65.5922

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.5066					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.8510					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.1143	0.0467	3.0477	6.2500e-003		0.4389	0.4389		0.4389	0.4389	44.9718	12.1718	57.1436	0.0830	2.6300e-003	60.0028
Landscaping	0.1003	0.0385	3.3385	1.8000e-004		0.0185	0.0185		0.0185	0.0185	0.0000	5.4587	5.4587	5.2300e-003	0.0000	5.5894
Total	**5.5721**	**0.0852**	**6.3862**	**6.4300e-003**		**0.4574**	**0.4574**		**0.4574**	**0.4574**	**44.9718**	**17.6305**	**62.6023**	**0.0883**	**2.6300e-003**	**65.5922**

Mitigated

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.5066					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.8510					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.1800e-003	0.0272	0.0116	1.7000e-004		2.2000e-003	2.2000e-003		2.2000e-003	2.2000e-003	0.0000	31.4595	31.4595	6.0000e-004	5.8000e-004	31.6465
Landscaping	0.1003	0.0385	3.3385	1.8000e-004		0.0185	0.0185		0.0185	0.0185	0.0000	5.4587	5.4587	5.2300e-003	0.0000	5.5894
Total	**3.4610**	**0.0656**	**3.3501**	**3.5000e-004**		**0.0207**	**0.0207**		**0.0207**	**0.0207**	**0.0000**	**36.9182**	**36.9182**	**5.8300e-003**	**5.8000e-004**	**37.2358**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Mitigated

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	29.6797	0.9500	0.0228	60.2117
Unmitigated	32.9774	1.0556	0.0253	66.9019

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Congregate Care (Assisted Living)	9.7731 / 6.1613	9.9887	0.3196	7.6500e-003	20.2590
Regional Shopping Center	2.9629 / 1.81597	3.0114	0.0969	2.3200e-003	6.1249
Single Family Housing	19.5462 / 12.3226	19.9773	0.6391	0.0153	40.5180
Total		**32.9774**	**1.0556**	**0.0253**	**66.9019**

Mitigated

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Congregate Care (Assisted Living)	8.79579 / 5.54517	8.9898	0.2876	6.8900e-003	18.2331
Regional Shopping Center	2.66661 / 1.63437	2.7103	0.0872	2.0900e-003	5.5124
Single Family Housing	17.5916 / 11.0903	17.9796	0.5752	0.0138	36.4662
Total		**29.6797**	**0.9500**	**0.0228**	**60.2117**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	109.4609	6.4690	0.0000	271.1846
Unmitigated	109.4609	6.4690	0.0000	271.1846

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Congregate Care (Assisted Living)	136.88	27.7854	1.6421	0.0000	68.8372
Regional Shopping Center	42	8.5256	0.5039	0.0000	21.1219
Single Family Housing	360.36	73.1498	4.3230	0.0000	181.2256
Total		**109.4608**	**6.4690**	**0.0000**	**271.1846**

Mitigated

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Congregate Care (Assisted Living)	136.88	27.7854	1.6421	0.0000	68.8372
Regional Shopping Center	42	8.5256	0.5039	0.0000	21.1219
Single Family Housing	360.36	73.1498	4.3230	0.0000	181.2256
Total		**109.4608**	**6.4690**	**0.0000**	**271.1846**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

Mitigated

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch Project

Bay Area AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Congregate Care (Assisted Living)	150.00	Dwelling Unit	9.38	150,000.00	429
Single Family Housing	300.00	Dwelling Unit	37.10	540,000.00	858
Regional Shopping Center	40.00	1000sqft	0.92	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site plan.

Construction Phase - Grading phase updating per project-specific info, and architectural coating phase set to occur concurrently with building construction.

Grading - Material export updated.

Vehicle Trips - Trip rates updated to match project-specific traffic report.

Mobile Land Use Mitigation - Project would improve pedestrian network.

Area Mitigation - Only natural gas hearths installed.

Water Mitigation - Water conservation strategy applied, per AQ Questionnaire.

Construction Off-road Equipment Mitigation - Graders, Scrapers and Rubber Tired Dozers mitigated.

Mitigated

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	55.00	740.00
tblConstructionPhase	NumDays	75.00	120.00
tblGrading	MaterialExported	0.00	300,000.00
tblLandUse	LotAcreage	97.40	37.10
tblVehicleTrips	ST_TR	2.93	2.60
tblVehicleTrips	ST_TR	46.12	37.75
tblVehicleTrips	ST_TR	9.54	9.44
tblVehicleTrips	SU_TR	3.15	2.60
tblVehicleTrips	SU_TR	21.10	37.75
tblVehicleTrips	SU_TR	8.55	9.44

2.0 Emissions Summary

Mitigated

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.9350	73.2659	38.1418	0.2489	19.8049	1.6817	21.0349	10.1417	1.5599	11.2733	0.0000	26,381.7992	26,381.7992	2.6244	3.2094	27,403.7961
2025	15.9389	16.3102	24.3603	0.0590	2.6316	0.6037	3.2353	0.7065	0.5709	1.2774	0.0000	5,901.9937	5,901.9937	0.7160	0.2124	5,982.3447
2026	15.9014	16.2658	24.0305	0.0583	2.6316	0.6031	3.2347	0.7065	0.5704	1.2769	0.0000	5,837.2680	5,837.2680	0.6782	0.2069	5,915.8853
2027	15.8672	16.2236	23.7517	0.0575	2.6316	0.6025	3.2341	0.7065	0.5698	1.2763	0.0000	5,774.9490	5,774.9490	0.6748	0.2016	5,851.8896
Maximum	**15.9389**	**73.2659**	**38.1418**	**0.2489**	**19.8049**	**1.6817**	**21.0349**	**10.1417**	**1.5599**	**11.2733**	**0.0000**	**26,381.7992**	**26,381.7992**	**2.6244**	**3.2094**	**27,403.7961**

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	1.9237	49.0114	41.8993	0.2489	19.8049	0.6919	20.1133	10.1417	0.6552	10.4287	0.0000	26,381.7992	26,381.7992	2.6244	3.2094	27,403.7961
2025	15.9389	16.3102	24.3603	0.0590	2.6316	0.6037	3.2353	0.7065	0.5709	1.2774	0.0000	5,901.9937	5,901.9937	0.7160	0.2124	5,982.3447
2026	15.9014	16.2658	24.0305	0.0583	2.6316	0.6031	3.2347	0.7065	0.5704	1.2769	0.0000	5,837.2680	5,837.2680	0.6782	0.2069	5,915.8853
2027	15.8672	16.2236	23.7517	0.0575	2.6316	0.6025	3.2341	0.7065	0.5698	1.2763	0.0000	5,774.9490	5,774.9490	0.6748	0.2016	5,851.8896
Maximum	**15.9389**	**49.0114**	**41.8993**	**0.2489**	**19.8049**	**0.6919**	**20.1133**	**10.1417**	**0.6552**	**10.4287**	**0.0000**	**26,381.7992**	**26,381.7992**	**2.6244**	**3.2094**	**27,403.7961**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**3.89**	**19.87**	**-3.41**	**0.00**	**0.00**	**28.35**	**3.00**	**0.00**	**27.66**	**5.59**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	392.0960	7.7772	520.6844	0.9162		68.6335	68.6335		68.6335	68.6335	7,369.1285	2,475.6808	9,844.8093	9.3414	0.5201	10,233.3463
Energy	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724
Mobile	10.4016	9.0985	83.8816	0.1840	21.2375	0.1271	21.3646	5.6568	0.1184	5.7751		19,444.4103	19,444.4103	1.1163	0.8369	19,721.7236
Total	**402.7735**	**19.2353**	**605.5806**	**1.1153**	**21.2375**	**68.9512**	**90.1887**	**5.6568**	**68.9425**	**74.5992**	**7,369.1285**	**24,930.4744**	**32,299.6029**	**10.5154**	**1.4123**	**32,983.3424**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.0825	5.3042	39.1698	0.0331		0.6001	0.6001		0.6001	0.6001	0.0000	6,292.7396	6,292.7396	0.1834	0.1141	6,331.3379
Energy	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724
Mobile	10.3207	8.9657	82.5867	0.1805	20.8128	0.1249	20.9376	5.5436	0.1163	5.6599		19,068.1003	19,068.1003	1.1021	0.8247	19,341.4154
Total	**30.6792**	**16.6296**	**122.7710**	**0.2286**	**20.8128**	**0.9156**	**21.7284**	**5.5436**	**0.9071**	**6.4507**	**0.0000**	**28,371.2232**	**28,371.2232**	**1.3432**	**0.9940**	**28,701.0257**

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	92.38	13.55	79.73	79.50	2.00	98.67	75.91	2.00	98.68	91.35	100.00	-13.80	12.16	87.23	29.61	12.98

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/10/2024	5	30	
2	Grading	Grading	5/11/2024	10/25/2024	5	120	
3	Paving	Paving	10/26/2024	1/10/2025	5	55	
4	Building Construction	Building Construction	1/11/2025	11/12/2027	5	740	
5	Architectural Coating	Architectural Coating	1/25/2025	11/26/2027	5	740	

Acres of Grading (Site Preparation Phase): 45

Acres of Grading (Grading Phase): 360

Acres of Paving: 0

Residential Indoor: 1,397,250; Residential Outdoor: 465,750; Non-Residential Indoor: 60,000; Non-Residential Outdoor: 20,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	229.00	55.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Mitigated

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310		3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**		**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0455	0.0250	0.4010	1.2400e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		127.9370	127.9370	2.9900e-003	2.9000e-003	128.8764
Total	**0.0455**	**0.0250**	**0.4010**	**1.2400e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**127.9370**	**127.9370**	**2.9900e-003**	**2.9000e-003**	**128.8764**

Mitigated

3.2 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	0.8894	7.1522	20.4431	0.0381		0.3077	0.3077		0.2864	0.2864	0.0000	3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**0.8894**	**7.1522**	**20.4431**	**0.0381**	**19.6570**	**0.3077**	**19.9647**	**10.1025**	**0.2864**	**10.3889**	**0.0000**	**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0455	0.0250	0.4010	1.2400e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		127.9370	127.9370	2.9900e-003	2.9000e-003	128.8764
Total	**0.0455**	**0.0250**	**0.4010**	**1.2400e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**127.9370**	**127.9370**	**2.9900e-003**	**2.9000e-003**	**128.8764**

Mitigated

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286		6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**		**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6663	40.8612	9.9734	0.1854	5.4661	0.3455	5.8117	1.4983	0.3306	1.8289		20,229.8983	20,229.8983	0.6774	3.2061	21,202.2596
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0505	0.0278	0.4456	1.3800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		142.1522	142.1522	3.3200e-003	3.2200e-003	143.1960
Total	**0.7169**	**40.8890**	**10.4190**	**0.1868**	**5.6304**	**0.3463**	**5.9767**	**1.5419**	**0.3313**	**1.8732**		**20,372.0505**	**20,372.0505**	**0.6807**	**3.2094**	**21,345.4556**

Mitigated

3.3 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	1.2069	8.1224	31.4803	0.0621		0.3456	0.3456		0.3239	0.3239	0.0000	6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**1.2069**	**8.1224**	**31.4803**	**0.0621**	**9.4863**	**0.3456**	**9.8319**	**3.6966**	**0.3239**	**4.0205**	**0.0000**	**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6663	40.8612	9.9734	0.1854	5.4661	0.3455	5.8117	1.4983	0.3306	1.8289		20,229.8983	20,229.8983	0.6774	3.2061	21,202.2596
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0505	0.0278	0.4456	1.3800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		142.1522	142.1522	3.3200e-003	3.2200e-003	143.1960
Total	**0.7169**	**40.8890**	**10.4190**	**0.1868**	**5.6304**	**0.3463**	**5.9767**	**1.5419**	**0.3313**	**1.8732**		**20,372.0505**	**20,372.0505**	**0.6807**	**3.2094**	**21,345.4556**

Mitigated

3.4 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0379	0.0208	0.3342	1.0300e-003	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		106.6142	106.6142	2.4900e-003	2.4200e-003	107.3970
Total	**0.0379**	**0.0208**	**0.3342**	**1.0300e-003**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**106.6142**	**106.6142**	**2.4900e-003**	**2.4200e-003**	**107.3970**

Mitigated

3.4 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0379	0.0208	0.3342	1.0300e-003	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		106.6142	106.6142	2.4900e-003	2.4200e-003	107.3970
Total	**0.0379**	**0.0208**	**0.3342**	**1.0300e-003**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**106.6142**	**106.6142**	**2.4900e-003**	**2.4200e-003**	**107.3970**

Mitigated

3.4 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.745 2	2,206.745 2	0.7137		2,224.587 8
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.745 2**	**2,206.745 2**	**0.7137**		**2,224.587 8**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0356	0.0188	0.3132	1.0000e-003	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		104.0533	104.0533	2.2600e-003	2.2700e-003	104.7853
Total	**0.0356**	**0.0188**	**0.3132**	**1.0000e-003**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**104.0533**	**104.0533**	**2.2600e-003**	**2.2700e-003**	**104.7853**

Mitigated

3.4 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850	0.0000	2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**	**0.0000**	**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0356	0.0188	0.3132	1.0000e-003	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		104.0533	104.0533	2.2600e-003	2.2700e-003	104.7853
Total	**0.0356**	**0.0188**	**0.3132**	**1.0000e-003**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**104.0533**	**104.0533**	**2.2600e-003**	**2.2700e-003**	**104.7853**

Mitigated

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0567	2.3513	0.7242	0.0108	0.3725	0.0144	0.3869	0.1073	0.0138	0.1210		1,156.4282	1,156.4282	0.0242	0.1709	1,207.9512
Worker	0.5435	0.2863	4.7817	0.0153	1.8812	8.5000e-003	1.8897	0.4990	7.8300e-003	0.5068		1,588.5464	1,588.5464	0.0345	0.0346	1,599.7220
Total	**0.6002**	**2.6375**	**5.5059**	**0.0260**	**2.2537**	**0.0229**	**2.2766**	**0.6062**	**0.0216**	**0.6278**		**2,744.9746**	**2,744.9746**	**0.0587**	**0.2055**	**2,807.6732**

Mitigated

3.5 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0567	2.3513	0.7242	0.0108	0.3725	0.0144	0.3869	0.1073	0.0138	0.1210		1,156.4282	1,156.4282	0.0242	0.1709	1,207.9512
Worker	0.5435	0.2863	4.7817	0.0153	1.8812	8.5000e-003	1.8897	0.4990	7.8300e-003	0.5068		1,588.5464	1,588.5464	0.0345	0.0346	1,599.7220
Total	**0.6002**	**2.6375**	**5.5059**	**0.0260**	**2.2537**	**0.0229**	**2.2766**	**0.6062**	**0.0216**	**0.6278**		**2,744.9746**	**2,744.9746**	**0.0587**	**0.2055**	**2,807.6732**

Mitigated

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0555	2.3376	0.7138	0.0106	0.3725	0.0143	0.3869	0.1073	0.0137	0.1210		1,135.2318	1,135.2318	0.0241	0.1676	1,185.7895
Worker	0.5133	0.2607	4.5158	0.0148	1.8812	8.1000e-003	1.8893	0.4990	7.4600e-003	0.5064		1,552.2983	1,552.2983	0.0315	0.0327	1,562.8341
Total	**0.5688**	**2.5982**	**5.2296**	**0.0254**	**2.2537**	**0.0224**	**2.2761**	**0.6062**	**0.0212**	**0.6274**		**2,687.5302**	**2,687.5302**	**0.0556**	**0.2004**	**2,748.6236**

Mitigated

3.5 Building Construction - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0555	2.3376	0.7138	0.0106	0.3725	0.0143	0.3869	0.1073	0.0137	0.1210		1,135.2318	1,135.2318	0.0241	0.1676	1,185.7895
Worker	0.5133	0.2607	4.5158	0.0148	1.8812	8.1000e-003	1.8893	0.4990	7.4600e-003	0.5064		1,552.2983	1,552.2983	0.0315	0.0327	1,562.8341
Total	**0.5688**	**2.5982**	**5.2296**	**0.0254**	**2.2537**	**0.0224**	**2.2761**	**0.6062**	**0.0212**	**0.6274**		**2,687.5302**	**2,687.5302**	**0.0556**	**0.2004**	**2,748.6236**

Mitigated

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0544	2.3210	0.7047	0.0104	0.3725	0.0142	0.3868	0.1073	0.0136	0.1209		1,112.3378	1,112.3378	0.0239	0.1642	1,161.8627
Worker	0.4857	0.2393	4.2912	0.0144	1.8812	7.6400e-003	1.8888	0.4990	7.0300e-003	0.5060		1,519.4681	1,519.4681	0.0289	0.0311	1,529.4676
Total	**0.5401**	**2.5603**	**4.9959**	**0.0247**	**2.2537**	**0.0219**	**2.2756**	**0.6062**	**0.0206**	**0.6269**		**2,631.8059**	**2,631.8059**	**0.0527**	**0.1953**	**2,691.3303**

Mitigated

3.5 Building Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0544	2.3210	0.7047	0.0104	0.3725	0.0142	0.3868	0.1073	0.0136	0.1209		1,112.3378	1,112.3378	0.0239	0.1642	1,161.8627
Worker	0.4857	0.2393	4.2912	0.0144	1.8812	7.6400e-003	1.8888	0.4990	7.0300e-003	0.5060		1,519.4681	1,519.4681	0.0289	0.0311	1,529.4676
Total	**0.5401**	**2.5603**	**4.9959**	**0.0247**	**2.2537**	**0.0219**	**2.2756**	**0.6062**	**0.0206**	**0.6269**		**2,631.8059**	**2,631.8059**	**0.0527**	**0.1953**	**2,691.3303**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1092	0.0575	0.9605	3.0600e-003	0.3779	1.7100e-003	0.3796	0.1002	1.5700e-003	0.1018		319.0967	319.0967	6.9300e-003	6.9500e-003	321.3415
Total	**0.1092**	**0.0575**	**0.9605**	**3.0600e-003**	**0.3779**	**1.7100e-003**	**0.3796**	**0.1002**	**1.5700e-003**	**0.1018**		**319.0967**	**319.0967**	**6.9300e-003**	**6.9500e-003**	**321.3415**

Mitigated

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1092	0.0575	0.9605	3.0600e-003	0.3779	1.7100e-003	0.3796	0.1002	1.5700e-003	0.1018		319.0967	319.0967	6.9300e-003	6.9500e-003	321.3415
Total	**0.1092**	**0.0575**	**0.9605**	**3.0600e-003**	**0.3779**	**1.7100e-003**	**0.3796**	**0.1002**	**1.5700e-003**	**0.1018**		**319.0967**	**319.0967**	**6.9300e-003**	**6.9500e-003**	**321.3415**

Mitigated

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1031	0.0524	0.9071	2.9700e-003	0.3779	1.6300e-003	0.3795	0.1002	1.5000e-003	0.1017		311.8154	311.8154	6.3200e-003	6.5700e-003	313.9317
Total	**0.1031**	**0.0524**	**0.9071**	**2.9700e-003**	**0.3779**	**1.6300e-003**	**0.3795**	**0.1002**	**1.5000e-003**	**0.1017**		**311.8154**	**311.8154**	**6.3200e-003**	**6.5700e-003**	**313.9317**

Mitigated

3.6 Architectural Coating - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1031	0.0524	0.9071	2.9700e-003	0.3779	1.6300e-003	0.3795	0.1002	1.5000e-003	0.1017		311.8154	311.8154	6.3200e-003	6.5700e-003	313.9317
Total	**0.1031**	**0.0524**	**0.9071**	**2.9700e-003**	**0.3779**	**1.6300e-003**	**0.3795**	**0.1002**	**1.5000e-003**	**0.1017**		**311.8154**	**311.8154**	**6.3200e-003**	**6.5700e-003**	**313.9317**

Mitigated

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0976	0.0481	0.8620	2.8800e-003	0.3779	1.5400e-003	0.3794	0.1002	1.4100e-003	0.1016		305.2207	305.2207	5.8000e-003	6.2500e-003	307.2293
Total	**0.0976**	**0.0481**	**0.8620**	**2.8800e-003**	**0.3779**	**1.5400e-003**	**0.3794**	**0.1002**	**1.4100e-003**	**0.1016**		**305.2207**	**305.2207**	**5.8000e-003**	**6.2500e-003**	**307.2293**

Mitigated

3.6 Architectural Coating - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0976	0.0481	0.8620	2.8800e-003	0.3779	1.5400e-003	0.3794	0.1002	1.4100e-003	0.1016		305.2207	305.2207	5.8000e-003	6.2500e-003	307.2293
Total	**0.0976**	**0.0481**	**0.8620**	**2.8800e-003**	**0.3779**	**1.5400e-003**	**0.3794**	**0.1002**	**1.4100e-003**	**0.1016**		**305.2207**	**305.2207**	**5.8000e-003**	**6.2500e-003**	**307.2293**

Mitigated

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	10.3207	8.9657	82.5867	0.1805	20.8128	0.1249	20.9376	5.5436	0.1163	5.6599		19,068.1003	19,068.1003	1.1021	0.8247	19,341.4154
Unmitigated	10.4016	9.0985	83.8816	0.1840	21.2375	0.1271	21.3646	5.6568	0.1184	5.7751		19,444.4103	19,444.4103	1.1163	0.8369	19,721.7236

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	390.00	390.00	390.00	900,747	882,732
Regional Shopping Center	1,510.00	1,510.00	1510.00	2,647,490	2,594,540
Single Family Housing	2,832.00	2,832.00	2832.00	6,540,808	6,409,992
Total	4,732.00	4,732.00	4,732.00	10,089,045	9,887,264

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Congregate Care (Assisted Living)	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

Mitigated

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724
NaturalGas Unmitigated	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3444.53	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Regional Shopping Center	256.438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	21887.3	0.2360	2.0171	0.8583	0.0129		0.1631	0.1631		0.1631	0.1631		2,574.9757	2,574.9757	0.0494	0.0472	2,590.2775
Total		**0.2760**	**2.3596**	**1.0145**	**0.0151**		**0.1907**	**0.1907**		**0.1907**	**0.1907**		**3,010.3832**	**3,010.3832**	**0.0577**	**0.0552**	**3,028.2725**

Mitigated

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3.44453	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Regional Shopping Center	0.256438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	21.8873	0.2360	2.0171	0.8583	0.0129		0.1631	0.1631		0.1631	0.1631		2,574.9757	2,574.9757	0.0494	0.0472	2,590.2775
Total		**0.2760**	**2.3596**	**1.0145**	**0.0151**		**0.1907**	**0.1907**		**0.1907**	**0.1907**		**3,010.3832**	**3,010.3832**	**0.0577**	**0.0552**	**3,028.2725**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	20.0825	5.3042	39.1698	0.0331		0.6001	0.6001		0.6001	0.6001	0.0000	6,292.7396	6,292.7396	0.1834	0.1141	6,331.3379
Unmitigated	392.0960	7.7772	520.6844	0.9162		68.6335	68.6335		68.6335	68.6335	7,369.1285	2,475.6808	9,844.8093	9.3414	0.5201	10,233.3463

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.6220					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	372.5843	7.3499	483.5900	0.9143		68.4277	68.4277		68.4277	68.4277	7,369.1285	2,408.8235	9,777.9520	9.2773	0.5201	10,164.8881
Landscaping	1.1140	0.4273	37.0945	1.9600e-003		0.2058	0.2058		0.2058	0.2058		66.8573	66.8573	0.0640		68.4582
Total	**392.0960**	**7.7772**	**520.6845**	**0.9162**		**68.6335**	**68.6335**		**68.6335**	**68.6335**	**7,369.1285**	**2,475.6808**	**9,844.8093**	**9.3414**	**0.5201**	**10,233.3463**

Mitigated

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.6220					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.5707	4.8769	2.0753	0.0311		0.3943	0.3943		0.3943	0.3943	0.0000	6,225.882 4	6,225.882 4	0.1193	0.1141	6,262.879 7
Landscaping	1.1140	0.4273	37.0945	1.9600e-003		0.2058	0.2058		0.2058	0.2058		66.8573	66.8573	0.0640		68.4582
Total	**20.0825**	**5.3042**	**39.1698**	**0.0331**		**0.6001**	**0.6001**		**0.6001**	**0.6001**	**0.0000**	**6,292.739 6**	**6,292.739 6**	**0.1834**	**0.1141**	**6,331.337 9**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch Project

Bay Area AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Congregate Care (Assisted Living)	150.00	Dwelling Unit	9.38	150,000.00	429
Single Family Housing	300.00	Dwelling Unit	37.10	540,000.00	858
Regional Shopping Center	40.00	1000sqft	0.92	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site plan.

Construction Phase - Grading phase updating per project-specific info, and architectural coating phase set to occur concurrently with building construction.

Grading - Material export updated.

Vehicle Trips - Trip rates updated to match project-specific traffic report.

Mobile Land Use Mitigation - Project would improve pedestrian network.

Area Mitigation - Only natural gas hearths installed.

Water Mitigation - Water conservation strategy applied, per AQ Questionnaire.

Construction Off-road Equipment Mitigation - Graders, Scrapers and Rubber Tired Dozers mitigated.

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	55.00	740.00
tblConstructionPhase	NumDays	75.00	120.00
tblGrading	MaterialExported	0.00	300,000.00
tblLandUse	LotAcreage	97.40	37.10
tblVehicleTrips	ST_TR	2.93	2.60
tblVehicleTrips	ST_TR	46.12	37.75
tblVehicleTrips	ST_TR	9.54	9.44
tblVehicleTrips	SU_TR	3.15	2.60
tblVehicleTrips	SU_TR	21.10	37.75
tblVehicleTrips	SU_TR	8.55	9.44

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.8959	75.6302	38.2520	0.2489	19.8049	1.6822	21.0349	10.1417	1.5604	11.2733	0.0000	26,391.0696	26,391.0696	2.6226	3.2131	27,414.1295
2025	15.9584	16.5271	24.1778	0.0577	2.6316	0.6037	3.2353	0.7065	0.5710	1.2774	0.0000	5,769.0351	5,769.0351	0.7163	0.2191	5,851.5156
2026	15.9220	16.4748	23.8704	0.0570	2.6316	0.6032	3.2348	0.7065	0.5705	1.2769	0.0000	5,707.5548	5,707.5548	0.6836	0.2132	5,788.1816
2027	15.8885	16.4257	23.6090	0.0563	2.6316	0.6025	3.2341	0.7065	0.5699	1.2763	0.0000	5,648.1207	5,648.1207	0.6799	0.2076	5,726.9703
Maximum	**15.9584**	**75.6302**	**38.2520**	**0.2489**	**19.8049**	**1.6822**	**21.0349**	**10.1417**	**1.5604**	**11.2733**	**0.0000**	**26,391.0696**	**26,391.0696**	**2.6226**	**3.2131**	**27,414.1295**

Mitigated

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	1.8846	51.3756	42.0094	0.2489	19.8049	0.6924	20.1133	10.1417	0.6557	10.4287	0.0000	26,391.0696	26,391.0696	2.6226	3.2131	27,414.1295
2025	15.9584	16.5271	24.1778	0.0577	2.6316	0.6037	3.2353	0.7065	0.5710	1.2774	0.0000	5,769.0351	5,769.0351	0.7163	0.2191	5,851.5156
2026	15.9220	16.4748	23.8704	0.0570	2.6316	0.6032	3.2348	0.7065	0.5705	1.2769	0.0000	5,707.5548	5,707.5548	0.6836	0.2132	5,788.1816
2027	15.8885	16.4257	23.6090	0.0563	2.6316	0.6025	3.2341	0.7065	0.5699	1.2763	0.0000	5,648.1207	5,648.1207	0.6799	0.2076	5,726.9703
Maximum	**15.9584**	**51.3756**	**42.0094**	**0.2489**	**19.8049**	**0.6924**	**20.1133**	**10.1417**	**0.6557**	**10.4287**	**0.0000**	**26,391.0696**	**26,391.0696**	**2.6226**	**3.2131**	**27,414.1295**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**3.89**	**19.39**	**-3.42**	**0.00**	**0.00**	**28.35**	**3.00**	**0.00**	**27.65**	**5.59**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	392.0960	7.7772	520.6844	0.9162		68.6335	68.6335		68.6335	68.6335	7,369.1285	2,475.6808	9,844.8093	9.3414	0.5201	10,233.3463
Energy	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724
Mobile	9.2333	10.4353	90.9522	0.1739	21.2375	0.1271	21.3647	5.6568	0.1184	5.7752		18,373.5722	18,373.5722	1.2648	0.9155	18,678.0059
Total	**401.6053**	**20.5722**	**612.6512**	**1.1052**	**21.2375**	**68.9513**	**90.1888**	**5.6568**	**68.9426**	**74.5993**	**7,369.1285**	**23,859.6363**	**31,228.7648**	**10.6638**	**1.4908**	**31,939.6246**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.0825	5.3042	39.1698	0.0331		0.6001	0.6001		0.6001	0.6001	0.0000	6,292.7396	6,292.7396	0.1834	0.1141	6,331.3379
Energy	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724
Mobile	9.1482	10.2839	89.6943	0.1706	20.8128	0.1249	20.9377	5.5436	0.1164	5.6600		18,019.0641	18,019.0641	1.2503	0.9024	18,319.2214
Total	**29.5067**	**17.9478**	**129.8786**	**0.2187**	**20.8128**	**0.9157**	**21.7285**	**5.5436**	**0.9072**	**6.4508**	**0.0000**	**27,322.1870**	**27,322.1870**	**1.4914**	**1.0717**	**27,678.8318**

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	92.65	12.76	78.80	80.21	2.00	98.67	75.91	2.00	98.68	91.35	100.00	-14.51	12.51	86.01	28.11	13.34

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/10/2024	5	30	
2	Grading	Grading	5/11/2024	10/25/2024	5	120	
3	Paving	Paving	10/26/2024	1/10/2025	5	55	
4	Building Construction	Building Construction	1/11/2025	11/12/2027	5	740	
5	Architectural Coating	Architectural Coating	1/25/2025	11/26/2027	5	740	

Acres of Grading (Site Preparation Phase): 45

Acres of Grading (Grading Phase): 360

Acres of Paving: 0

Residential Indoor: 1,397,250; Residential Outdoor: 465,750; Non-Residential Indoor: 60,000; Non-Residential Outdoor: 20,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	229.00	55.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310		3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**		**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0468	0.0308	0.3855	1.1500e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		118.8877	118.8877	3.4100e-003	3.3400e-003	119.9678
Total	**0.0468**	**0.0308**	**0.3855**	**1.1500e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**118.8877**	**118.8877**	**3.4100e-003**	**3.3400e-003**	**119.9678**

Mitigated

3.2 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	0.8894	7.1522	20.4431	0.0381		0.3077	0.3077		0.2864	0.2864	0.0000	3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**0.8894**	**7.1522**	**20.4431**	**0.0381**	**19.6570**	**0.3077**	**19.9647**	**10.1025**	**0.2864**	**10.3889**	**0.0000**	**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0468	0.0308	0.3855	1.1500e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		118.8877	118.8877	3.4100e-003	3.3400e-003	119.9678
Total	**0.0468**	**0.0308**	**0.3855**	**1.1500e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**118.8877**	**118.8877**	**3.4100e-003**	**3.3400e-003**	**119.9678**

Mitigated

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286		6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**		**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6257	43.2190	10.1009	0.1856	5.4661	0.3461	5.8122	1.4983	0.3311	1.8294		20,249.2235	20,249.2235	0.6751	3.2094	21,222.4915
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0520	0.0342	0.4283	1.2800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		132.0975	132.0975	3.7900e-003	3.7100e-003	133.2975
Total	**0.6778**	**43.2532**	**10.5291**	**0.1869**	**5.6304**	**0.3468**	**5.9773**	**1.5419**	**0.3318**	**1.8737**		**20,381.3210**	**20,381.3210**	**0.6789**	**3.2131**	**21,355.7890**

Mitigated

3.3 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	1.2069	8.1224	31.4803	0.0621		0.3456	0.3456		0.3239	0.3239	0.0000	6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**1.2069**	**8.1224**	**31.4803**	**0.0621**	**9.4863**	**0.3456**	**9.8319**	**3.6966**	**0.3239**	**4.0205**	**0.0000**	**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6257	43.2190	10.1009	0.1856	5.4661	0.3461	5.8122	1.4983	0.3311	1.8294		20,249.2235	20,249.2235	0.6751	3.2094	21,222.4915
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0520	0.0342	0.4283	1.2800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		132.0975	132.0975	3.7900e-003	3.7100e-003	133.2975
Total	**0.6778**	**43.2532**	**10.5291**	**0.1869**	**5.6304**	**0.3468**	**5.9773**	**1.5419**	**0.3318**	**1.8737**		**20,381.3210**	**20,381.3210**	**0.6789**	**3.2131**	**21,355.7890**

3.4 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0390	0.0257	0.3212	9.6000e-004	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		99.0731	99.0731	2.8400e-003	2.7800e-003	99.9731
Total	**0.0390**	**0.0257**	**0.3212**	**9.6000e-004**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**99.0731**	**99.0731**	**2.8400e-003**	**2.7800e-003**	**99.9731**

Mitigated

3.4 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0390	0.0257	0.3212	9.6000e-004	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		99.0731	99.0731	2.8400e-003	2.7800e-003	99.9731
Total	**0.0390**	**0.0257**	**0.3212**	**9.6000e-004**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**99.0731**	**99.0731**	**2.8400e-003**	**2.7800e-003**	**99.9731**

Mitigated

3.4 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.745 2	2,206.745 2	0.7137		2,224.587 8
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.745 2**	**2,206.745 2**	**0.7137**		**2,224.587 8**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0368	0.0231	0.3019	9.3000e-004	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		96.7068	96.7068	2.5900e-003	2.6100e-003	97.5484
Total	**0.0368**	**0.0231**	**0.3019**	**9.3000e-004**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**96.7068**	**96.7068**	**2.5900e-003**	**2.6100e-003**	**97.5484**

Mitigated

3.4 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850	0.0000	2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**	**0.0000**	**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0368	0.0231	0.3019	9.3000e-004	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		96.7068	96.7068	2.5900e-003	2.6100e-003	97.5484
Total	**0.0368**	**0.0231**	**0.3019**	**9.3000e-004**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**96.7068**	**96.7068**	**2.5900e-003**	**2.6100e-003**	**97.5484**

Mitigated

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0546	2.4880	0.7496	0.0108	0.3725	0.0145	0.3870	0.1073	0.0138	0.1211		1,158.1542	1,158.1542	0.0241	0.1713	1,209.7990
Worker	0.5616	0.3530	4.6087	0.0142	1.8812	8.5000e-003	1.8897	0.4990	7.8300e-003	0.5068		1,476.3909	1,476.3909	0.0395	0.0398	1,489.2384
Total	**0.6161**	**2.8411**	**5.3583**	**0.0250**	**2.2537**	**0.0230**	**2.2767**	**0.6062**	**0.0217**	**0.6279**		**2,634.5451**	**2,634.5451**	**0.0635**	**0.2111**	**2,699.0374**

Mitigated

3.5 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0546	2.4880	0.7496	0.0108	0.3725	0.0145	0.3870	0.1073	0.0138	0.1211		1,158.1542	1,158.1542	0.0241	0.1713	1,209.7990
Worker	0.5616	0.3530	4.6087	0.0142	1.8812	8.5000e-003	1.8897	0.4990	7.8300e-003	0.5068		1,476.3909	1,476.3909	0.0395	0.0398	1,489.2384
Total	**0.6161**	**2.8411**	**5.3583**	**0.0250**	**2.2537**	**0.0230**	**2.2767**	**0.6062**	**0.0217**	**0.6279**		**2,634.5451**	**2,634.5451**	**0.0635**	**0.2111**	**2,699.0374**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0533	2.4736	0.7389	0.0106	0.3725	0.0144	0.3869	0.1073	0.0138	0.1210		1,136.9550	1,136.9550	0.0239	0.1681	1,187.6312
Worker	0.5323	0.3214	4.3616	0.0137	1.8812	8.1000e-003	1.8893	0.4990	7.4600e-003	0.5064		1,442.8477	1,442.8477	0.0361	0.0376	1,454.9582
Total	**0.5855**	**2.7950**	**5.1005**	**0.0243**	**2.2537**	**0.0225**	**2.2762**	**0.6062**	**0.0212**	**0.6274**		**2,579.8027**	**2,579.8027**	**0.0600**	**0.2057**	**2,642.5893**

Mitigated

3.5 Building Construction - 2026

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0533	2.4736	0.7389	0.0106	0.3725	0.0144	0.3869	0.1073	0.0138	0.1210		1,136.9550	1,136.9550	0.0239	0.1681	1,187.6312
Worker	0.5323	0.3214	4.3616	0.0137	1.8812	8.1000e-003	1.8893	0.4990	7.4600e-003	0.5064		1,442.8477	1,442.8477	0.0361	0.0376	1,454.9582
Total	**0.5855**	**2.7950**	**5.1005**	**0.0243**	**2.2537**	**0.0225**	**2.2762**	**0.6062**	**0.0212**	**0.6274**		**2,579.8027**	**2,579.8027**	**0.0600**	**0.2057**	**2,642.5893**

Mitigated

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0521	2.4563	0.7296	0.0104	0.3725	0.0143	0.3868	0.1073	0.0136	0.1209		1,114.0545	1,114.0545	0.0237	0.1646	1,163.6950
Worker	0.5053	0.2950	4.1517	0.0133	1.8812	7.6400e-003	1.8888	0.4990	7.0300e-003	0.5060		1,412.4252	1,412.4252	0.0332	0.0358	1,423.9181
Total	**0.5575**	**2.7513**	**4.8813**	**0.0237**	**2.2537**	**0.0219**	**2.2756**	**0.6062**	**0.0207**	**0.6269**		**2,526.4797**	**2,526.4797**	**0.0569**	**0.2004**	**2,587.6131**

Mitigated

3.5 Building Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0521	2.4563	0.7296	0.0104	0.3725	0.0143	0.3868	0.1073	0.0136	0.1209		1,114.0545	1,114.0545	0.0237	0.1646	1,163.6950
Worker	0.5053	0.2950	4.1517	0.0133	1.8812	7.6400e-003	1.8888	0.4990	7.0300e-003	0.5060		1,412.4252	1,412.4252	0.0332	0.0358	1,423.9181
Total	**0.5575**	**2.7513**	**4.8813**	**0.0237**	**2.2537**	**0.0219**	**2.2756**	**0.6062**	**0.0207**	**0.6269**		**2,526.4797**	**2,526.4797**	**0.0569**	**0.2004**	**2,587.6131**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1128	0.0709	0.9258	2.8500e-003	0.3779	1.7100e-003	0.3796	0.1002	1.5700e-003	0.1018		296.5676	296.5676	7.9300e-003	7.9900e-003	299.1483
Total	**0.1128**	**0.0709**	**0.9258**	**2.8500e-003**	**0.3779**	**1.7100e-003**	**0.3796**	**0.1002**	**1.5700e-003**	**0.1018**		**296.5676**	**296.5676**	**7.9300e-003**	**7.9900e-003**	**299.1483**

Mitigated

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1128	0.0709	0.9258	2.8500e-003	0.3779	1.7100e-003	0.3796	0.1002	1.5700e-003	0.1018		296.5676	296.5676	7.9300e-003	7.9900e-003	299.1483
Total	**0.1128**	**0.0709**	**0.9258**	**2.8500e-003**	**0.3779**	**1.7100e-003**	**0.3796**	**0.1002**	**1.5700e-003**	**0.1018**		**296.5676**	**296.5676**	**7.9300e-003**	**7.9900e-003**	**299.1483**

Mitigated

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1069	0.0646	0.8761	2.7600e-003	0.3779	1.6300e-003	0.3795	0.1002	1.5000e-003	0.1017		289.8297	289.8297	7.2500e-003	7.5500e-003	292.2623
Total	**0.1069**	**0.0646**	**0.8761**	**2.7600e-003**	**0.3779**	**1.6300e-003**	**0.3795**	**0.1002**	**1.5000e-003**	**0.1017**		**289.8297**	**289.8297**	**7.2500e-003**	**7.5500e-003**	**292.2623**

Mitigated

3.6 Architectural Coating - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1069	0.0646	0.8761	2.7600e-003	0.3779	1.6300e-003	0.3795	0.1002	1.5000e-003	0.1017		289.8297	289.8297	7.2500e-003	7.5500e-003	292.2623
Total	**0.1069**	**0.0646**	**0.8761**	**2.7600e-003**	**0.3779**	**1.6300e-003**	**0.3795**	**0.1002**	**1.5000e-003**	**0.1017**		**289.8297**	**289.8297**	**7.2500e-003**	**7.5500e-003**	**292.2623**

Mitigated

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1015	0.0593	0.8340	2.6800e-003	0.3779	1.5400e-003	0.3794	0.1002	1.4100e-003	0.1016		283.7186	283.7186	6.6700e-003	7.1900e-003	286.0272
Total	**0.1015**	**0.0593**	**0.8340**	**2.6800e-003**	**0.3779**	**1.5400e-003**	**0.3794**	**0.1002**	**1.4100e-003**	**0.1016**		**283.7186**	**283.7186**	**6.6700e-003**	**7.1900e-003**	**286.0272**

Mitigated

3.6 Architectural Coating - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**13.8621**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1015	0.0593	0.8340	2.6800e-003	0.3779	1.5400e-003	0.3794	0.1002	1.4100e-003	0.1016		283.7186	283.7186	6.6700e-003	7.1900e-003	286.0272
Total	**0.1015**	**0.0593**	**0.8340**	**2.6800e-003**	**0.3779**	**1.5400e-003**	**0.3794**	**0.1002**	**1.4100e-003**	**0.1016**		**283.7186**	**283.7186**	**6.6700e-003**	**7.1900e-003**	**286.0272**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	9.1482	10.2839	89.6943	0.1706	20.8128	0.1249	20.9377	5.5436	0.1164	5.6600		18,019.0641	18,019.0641	1.2503	0.9024	18,319.2214
Unmitigated	9.2333	10.4353	90.9522	0.1739	21.2375	0.1271	21.3647	5.6568	0.1184	5.7752		18,373.5722	18,373.5722	1.2648	0.9155	18,678.0059

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	390.00	390.00	390.00	900,747	882,732
Regional Shopping Center	1,510.00	1,510.00	1510.00	2,647,490	2,594,540
Single Family Housing	2,832.00	2,832.00	2832.00	6,540,808	6,409,992
Total	4,732.00	4,732.00	4,732.00	10,089,045	9,887,264

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Congregate Care (Assisted	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

Mitigated

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724
NaturalGas Unmitigated	0.2760	2.3596	1.0145	0.0151		0.1907	0.1907		0.1907	0.1907		3,010.3832	3,010.3832	0.0577	0.0552	3,028.2724

Mitigated

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3444.53	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Regional Shopping Center	256.438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	21887.3	0.2360	2.0171	0.8583	0.0129		0.1631	0.1631		0.1631	0.1631		2,574.9757	2,574.9757	0.0494	0.0472	2,590.2775
Total		**0.2760**	**2.3596**	**1.0145**	**0.0151**		**0.1907**	**0.1907**		**0.1907**	**0.1907**		**3,010.3832**	**3,010.3832**	**0.0577**	**0.0552**	**3,028.2725**

Mitigated

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3.44453	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Regional Shopping Center	0.256438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	21.8873	0.2360	2.0171	0.8583	0.0129		0.1631	0.1631		0.1631	0.1631		2,574.9757	2,574.9757	0.0494	0.0472	2,590.2775
Total		**0.2760**	**2.3596**	**1.0145**	**0.0151**		**0.1907**	**0.1907**		**0.1907**	**0.1907**		**3,010.3832**	**3,010.3832**	**0.0577**	**0.0552**	**3,028.2725**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	20.0825	5.3042	39.1698	0.0331		0.6001	0.6001		0.6001	0.6001	0.0000	6,292.7396	6,292.7396	0.1834	0.1141	6,331.3379
Unmitigated	392.0960	7.7772	520.6844	0.9162		68.6335	68.6335		68.6335	68.6335	7,369.1285	2,475.6808	9,844.8093	9.3414	0.5201	10,233.3463

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.6220					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	372.5843	7.3499	483.5900	0.9143		68.4277	68.4277		68.4277	68.4277	7,369.1285	2,408.8235	9,777.9520	9.2773	0.5201	10,164.8881
Landscaping	1.1140	0.4273	37.0945	1.9600e-003		0.2058	0.2058		0.2058	0.2058		66.8573	66.8573	0.0640		68.4582
Total	**392.0960**	**7.7772**	**520.6845**	**0.9162**		**68.6335**	**68.6335**		**68.6335**	**68.6335**	**7,369.1285**	**2,475.6808**	**9,844.8093**	**9.3414**	**0.5201**	**10,233.3463**

Mitigated

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.6220					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.5707	4.8769	2.0753	0.0311		0.3943	0.3943		0.3943	0.3943	0.0000	6,225.882 4	6,225.882 4	0.1193	0.1141	6,262.879 7
Landscaping	1.1140	0.4273	37.0945	1.9600e-003		0.2058	0.2058		0.2058	0.2058		66.8573	66.8573	0.0640		68.4582
Total	**20.0825**	**5.3042**	**39.1698**	**0.0331**		**0.6001**	**0.6001**		**0.6001**	**0.6001**	**0.0000**	**6,292.739 6**	**6,292.739 6**	**0.1834**	**0.1141**	**6,331.337 9**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch - Existing Land Use Designation Alternative

Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	127.00	Dwelling Unit	63.70	228,600.00	363
Regional Shopping Center	65.34	1000sqft	3.00	65,340.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site dimensions.

Construction Phase - Grading phase timing adjusted to accomodate soil import.

Grading - Material export updated per site-specific information.

Vehicle Trips - Operational emissions not modeled.

Woodstoves - Operational emissions not modeled.

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	75.00	1,110.00
tblConstructionPhase	NumDays	110.00	120.00
tblFireplaces	NumberGas	31.75	0.00
tblFireplaces	NumberWood	54.61	0.00
tblGrading	MaterialImported	0.00	300,000.00
tblLandUse	LotAcreage	41.23	63.70
tblLandUse	LotAcreage	1.50	3.00
tblVehicleTrips	ST_TR	46.12	0.00
tblVehicleTrips	ST_TR	9.54	0.00
tblVehicleTrips	SU_TR	21.10	0.00
tblVehicleTrips	SU_TR	8.55	0.00
tblVehicleTrips	WD_TR	37.75	0.00
tblVehicleTrips	WD_TR	9.44	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.3079	5.2095	2.9401	0.0162	1.2939	0.1342	1.4281	0.5149	0.1242	0.6392	0.0000	1,543.7561	1,543.7561	0.1765	0.1749	1,600.2838
2025	0.5855	1.8069	2.4767	4.8500e-003	0.0898	0.0733	0.1631	0.0243	0.0691	0.0934	0.0000	428.7828	428.7828	0.0770	8.9100e-003	433.3617
2026	0.6846	1.9282	2.5685	5.1400e-003	0.1031	0.0768	0.1798	0.0279	0.0726	0.1005	0.0000	454.8130	454.8130	0.0756	0.0101	459.7233
2027	0.6833	1.9261	2.5586	5.1100e-003	0.1031	0.0767	0.1798	0.0279	0.0726	0.1005	0.0000	452.3617	452.3617	0.0755	9.8900e-003	457.1945
2028	0.6796	1.9170	2.5406	5.0600e-003	0.1027	0.0764	0.1791	0.0278	0.0723	0.1001	0.0000	448.3691	448.3691	0.0751	9.6200e-003	453.1116
2029	0.2926	0.7790	1.0332	2.0500e-003	0.0420	0.0311	0.0731	0.0114	0.0294	0.0408	0.0000	181.7734	181.7734	0.0304	3.7900e-003	183.6620
Maximum	**0.6846**	**5.2095**	**2.9401**	**0.0162**	**1.2939**	**0.1342**	**1.4281**	**0.5149**	**0.1242**	**0.6392**	**0.0000**	**1,543.7561**	**1,543.7561**	**0.1765**	**0.1749**	**1,600.2838**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.3079	5.2095	2.9401	0.0162	1.2939	0.1342	1.4281	0.5149	0.1242	0.6392	0.0000	1,543.7556	1,543.7556	0.1765	0.1749	1,600.2832
2025	0.5855	1.8069	2.4767	4.8500e-003	0.0898	0.0733	0.1631	0.0243	0.0691	0.0934	0.0000	428.7824	428.7824	0.0770	8.9100e-003	433.3613
2026	0.6846	1.9282	2.5685	5.1400e-003	0.1031	0.0768	0.1798	0.0279	0.0726	0.1005	0.0000	454.8126	454.8126	0.0756	0.0101	459.7229
2027	0.6833	1.9261	2.5586	5.1100e-003	0.1031	0.0767	0.1798	0.0279	0.0726	0.1005	0.0000	452.3613	452.3613	0.0755	9.8900e-003	457.1941
2028	0.6796	1.9170	2.5406	5.0600e-003	0.1027	0.0764	0.1791	0.0278	0.0723	0.1001	0.0000	448.3687	448.3687	0.0751	9.6200e-003	453.1112
2029	0.2926	0.7790	1.0332	2.0500e-003	0.0420	0.0311	0.0731	0.0114	0.0294	0.0408	0.0000	181.7732	181.7732	0.0304	3.7900e-003	183.6618
Maximum	**0.6846**	**5.2095**	**2.9401**	**0.0162**	**1.2939**	**0.1342**	**1.4281**	**0.5149**	**0.1242**	**0.6392**	**0.0000**	**1,543.7556**	**1,543.7556**	**0.1765**	**0.1749**	**1,600.2832**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
1	**4-1-2024**	**6-30-2024**	1.5969	1.5969
2	**7-1-2024**	**9-30-2024**	2.5366	2.5366
3	**10-1-2024**	**12-31-2024**	1.3079	1.3079
4	**1-1-2025**	**3-31-2025**	0.4258	0.4258
5	**4-1-2025**	**6-30-2025**	0.6502	0.6502

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6	**7-1-2025**	**9-30-2025**	0.6574	0.6574
7	**10-1-2025**	**12-31-2025**	0.6603	0.6603
8	**1-1-2026**	**3-31-2026**	0.6450	0.6450
9	**4-1-2026**	**6-30-2026**	0.6494	0.6494
10	**7-1-2026**	**9-30-2026**	0.6565	0.6565
11	**10-1-2026**	**12-31-2026**	0.6594	0.6594
12	**1-1-2027**	**3-31-2027**	0.6442	0.6442
13	**4-1-2027**	**6-30-2027**	0.6486	0.6486
14	**7-1-2027**	**9-30-2027**	0.6557	0.6557
15	**10-1-2027**	**12-31-2027**	0.6585	0.6585
16	**1-1-2028**	**3-31-2028**	0.6506	0.6506
17	**4-1-2028**	**6-30-2028**	0.6479	0.6479
18	**7-1-2028**	**9-30-2028**	0.6550	0.6550
19	**10-1-2028**	**12-31-2028**	0.6577	0.6577
20	**1-1-2029**	**3-31-2029**	0.6426	0.6426
21	**4-1-2029**	**6-30-2029**	0.4154	0.4154
		Highest	2.5366	2.5366

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.4041	0.0157	1.2407	1.0200e-003		0.0538	0.0538		0.0538	0.0538	6.5083	1.5415	8.0498	0.0319	0.0000	8.8474
Energy	0.0191	0.1633	0.0726	1.0400e-003		0.0132	0.0132		0.0132	0.0132	0.0000	343.4901	343.4901	0.0287	6.4900e-003	346.1423
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	44.8752	0.0000	44.8752	2.6521	0.0000	111.1764
Water						0.0000	0.0000		0.0000	0.0000	4.1606	9.2156	13.3762	0.4288	0.0103	27.1576
Total	**1.4232**	**0.1791**	**1.3133**	**2.0600e-003**	**0.0000**	**0.0670**	**0.0670**	**0.0000**	**0.0670**	**0.0670**	**55.5441**	**354.2472**	**409.7914**	**3.1415**	**0.0168**	**493.3238**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.4041	0.0157	1.2407	1.0200e-003		0.0538	0.0538		0.0538	0.0538	6.5083	1.5415	8.0498	0.0319	0.0000	8.8474
Energy	0.0191	0.1633	0.0726	1.0400e-003		0.0132	0.0132		0.0132	0.0132	0.0000	343.4901	343.4901	0.0287	6.4900e-003	346.1423
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	44.8752	0.0000	44.8752	2.6521	0.0000	111.1764
Water						0.0000	0.0000		0.0000	0.0000	4.1606	9.2156	13.3762	0.4288	0.0103	27.1576
Total	**1.4232**	**0.1791**	**1.3133**	**2.0600e-003**	**0.0000**	**0.0670**	**0.0670**	**0.0000**	**0.0670**	**0.0670**	**55.5441**	**354.2472**	**409.7914**	**3.1415**	**0.0168**	**493.3238**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/24/2024	5	40	
2	Grading	Grading	5/25/2024	11/8/2024	5	120	
3	Paving	Paving	11/9/2024	2/21/2025	5	75	

4	Building Construction	Building Construction	2/22/2025	5/25/2029	5	1110	
5	Architectural Coating	Architectural Coating	3/8/2025	6/8/2029	5	1110	

Acres of Grading (Site Preparation Phase): 60

Acres of Grading (Grading Phase): 360

Acres of Paving: 0

Residential Indoor: 462,915; Residential Outdoor: 154,305; Non-Residential Indoor: 98,010; Non-Residential Outdoor: 32,670; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	67.00	24.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3931	0.0000	0.3931	0.2021	0.0000	0.2021	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0532	0.5435	0.3667	7.6000e-004		0.0246	0.0246		0.0226	0.0226	0.0000	66.9141	66.9141	0.0216	0.0000	67.4552
Total	**0.0532**	**0.5435**	**0.3667**	**7.6000e-004**	**0.3931**	**0.0246**	**0.4177**	**0.2021**	**0.0226**	**0.2247**	**0.0000**	**66.9141**	**66.9141**	**0.0216**	**0.0000**	**67.4552**

3.2 Site Preparation - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6000e-004	5.6000e-004	7.4600e-003	2.0000e-005	2.8400e-003	1.0000e-005	2.8600e-003	7.6000e-004	1.0000e-005	7.7000e-004	0.0000	2.1745	2.1745	6.0000e-005	6.0000e-005	2.1929
Total	**8.6000e-004**	**5.6000e-004**	**7.4600e-003**	**2.0000e-005**	**2.8400e-003**	**1.0000e-005**	**2.8600e-003**	**7.6000e-004**	**1.0000e-005**	**7.7000e-004**	**0.0000**	**2.1745**	**2.1745**	**6.0000e-005**	**6.0000e-005**	**2.1929**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3931	0.0000	0.3931	0.2021	0.0000	0.2021	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0532	0.5435	0.3667	7.6000e-004		0.0246	0.0246		0.0226	0.0226	0.0000	66.9141	66.9141	0.0216	0.0000	67.4551
Total	**0.0532**	**0.5435**	**0.3667**	**7.6000e-004**	**0.3931**	**0.0246**	**0.4177**	**0.2021**	**0.0226**	**0.2247**	**0.0000**	**66.9141**	**66.9141**	**0.0216**	**0.0000**	**67.4551**

3.2 Site Preparation - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6000e-004	5.6000e-004	7.4600e-003	2.0000e-005	2.8400e-003	1.0000e-005	2.8600e-003	7.6000e-004	1.0000e-005	7.7000e-004	0.0000	2.1745	2.1745	6.0000e-005	6.0000e-005	2.1929
Total	**8.6000e-004**	**5.6000e-004**	**7.4600e-003**	**2.0000e-005**	**2.8400e-003**	**1.0000e-005**	**2.8600e-003**	**7.6000e-004**	**1.0000e-005**	**7.7000e-004**	**0.0000**	**2.1745**	**2.1745**	**6.0000e-005**	**6.0000e-005**	**2.1929**

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5692	0.0000	0.5692	0.2218	0.0000	0.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1931	1.9426	1.6634	3.7200e-003		0.0801	0.0801		0.0737	0.0737	0.0000	327.1171	327.1171	0.1058	0.0000	329.7621
Total	**0.1931**	**1.9426**	**1.6634**	**3.7200e-003**	**0.5692**	**0.0801**	**0.6493**	**0.2218**	**0.0737**	**0.2955**	**0.0000**	**327.1171**	**327.1171**	**0.1058**	**0.0000**	**329.7621**

3.3 Grading - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0390	2.5443	0.6014	0.0111	0.3171	0.0207	0.3379	0.0872	0.0199	0.1071	0.0000	1,101.5768	1,101.5768	0.0368	0.1746	1,154.5248
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	1.8800e-003	0.0249	8.0000e-005	9.4800e-003	5.0000e-005	9.5300e-003	2.5200e-003	4.0000e-005	2.5700e-003	0.0000	7.2483	7.2483	1.9000e-004	1.9000e-004	7.3098
Total	**0.0418**	**2.5461**	**0.6263**	**0.0112**	**0.3266**	**0.0208**	**0.3474**	**0.0898**	**0.0199**	**0.1097**	**0.0000**	**1,108.8251**	**1,108.8251**	**0.0370**	**0.1748**	**1,161.8346**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5692	0.0000	0.5692	0.2218	0.0000	0.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1931	1.9426	1.6634	3.7200e-003		0.0801	0.0801		0.0737	0.0737	0.0000	327.1168	327.1168	0.1058	0.0000	329.7617
Total	**0.1931**	**1.9426**	**1.6634**	**3.7200e-003**	**0.5692**	**0.0801**	**0.6493**	**0.2218**	**0.0737**	**0.2955**	**0.0000**	**327.1168**	**327.1168**	**0.1058**	**0.0000**	**329.7617**

3.3 Grading - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0390	2.5443	0.6014	0.0111	0.3171	0.0207	0.3379	0.0872	0.0199	0.1071	0.0000	1,101.576 8	1,101.576 8	0.0368	0.1746	1,154.524 8
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	1.8800e-003	0.0249	8.0000e-005	9.4800e-003	5.0000e-005	9.5300e-003	2.5200e-003	4.0000e-005	2.5700e-003	0.0000	7.2483	7.2483	1.9000e-004	1.9000e-004	7.3098
Total	**0.0418**	**2.5461**	**0.6263**	**0.0112**	**0.3266**	**0.0208**	**0.3474**	**0.0898**	**0.0199**	**0.1097**	**0.0000**	**1,108.825 1**	**1,108.825 1**	**0.0370**	**0.1748**	**1,161.834 6**

3.4 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0183	0.1762	0.2706	4.2000e-004		8.6700e-003	8.6700e-003		7.9700e-003	7.9700e-003	0.0000	37.0491	37.0491	0.0120	0.0000	37.3486
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0183**	**0.1762**	**0.2706**	**4.2000e-004**		**8.6700e-003**	**8.6700e-003**		**7.9700e-003**	**7.9700e-003**	**0.0000**	**37.0491**	**37.0491**	**0.0120**	**0.0000**	**37.3486**

3.4 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.6000e-004	4.3000e-004	5.7500e-003	2.0000e-005	2.1900e-003	1.0000e-005	2.2000e-003	5.8000e-004	1.0000e-005	5.9000e-004	0.0000	1.6762	1.6762	4.0000e-005	4.0000e-005	1.6904
Total	**6.6000e-004**	**4.3000e-004**	**5.7500e-003**	**2.0000e-005**	**2.1900e-003**	**1.0000e-005**	**2.2000e-003**	**5.8000e-004**	**1.0000e-005**	**5.9000e-004**	**0.0000**	**1.6762**	**1.6762**	**4.0000e-005**	**4.0000e-005**	**1.6904**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0183	0.1762	0.2706	4.2000e-004		8.6700e-003	8.6700e-003		7.9700e-003	7.9700e-003	0.0000	37.0490	37.0490	0.0120	0.0000	37.3486
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0183**	**0.1762**	**0.2706**	**4.2000e-004**		**8.6700e-003**	**8.6700e-003**		**7.9700e-003**	**7.9700e-003**	**0.0000**	**37.0490**	**37.0490**	**0.0120**	**0.0000**	**37.3486**

3.4 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.6000e-004	4.3000e-004	5.7500e-003	2.0000e-005	2.1900e-003	1.0000e-005	2.2000e-003	5.8000e-004	1.0000e-005	5.9000e-004	0.0000	1.6762	1.6762	4.0000e-005	4.0000e-005	1.6904
Total	**6.6000e-004**	**4.3000e-004**	**5.7500e-003**	**2.0000e-005**	**2.1900e-003**	**1.0000e-005**	**2.2000e-003**	**5.8000e-004**	**1.0000e-005**	**5.9000e-004**	**0.0000**	**1.6762**	**1.6762**	**4.0000e-005**	**4.0000e-005**	**1.6904**

3.4 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0174	0.1631	0.2770	4.3000e-004		7.9500e-003	7.9500e-003		7.3200e-003	7.3200e-003	0.0000	38.0366	38.0366	0.0123	0.0000	38.3441
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0174**	**0.1631**	**0.2770**	**4.3000e-004**		**7.9500e-003**	**7.9500e-003**		**7.3200e-003**	**7.3200e-003**	**0.0000**	**38.0366**	**38.0366**	**0.0123**	**0.0000**	**38.3441**

3.4 Paving - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.4000e-004	4.0000e-004	5.5400e-003	2.0000e-005	2.2500e-003	1.0000e-005	2.2600e-003	6.0000e-004	1.0000e-005	6.1000e-004	0.0000	1.6803	1.6803	4.0000e-005	4.0000e-005	1.6940
Total	**6.4000e-004**	**4.0000e-004**	**5.5400e-003**	**2.0000e-005**	**2.2500e-003**	**1.0000e-005**	**2.2600e-003**	**6.0000e-004**	**1.0000e-005**	**6.1000e-004**	**0.0000**	**1.6803**	**1.6803**	**4.0000e-005**	**4.0000e-005**	**1.6940**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0174	0.1631	0.2770	4.3000e-004		7.9500e-003	7.9500e-003		7.3200e-003	7.3200e-003	0.0000	38.0365	38.0365	0.0123	0.0000	38.3441
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0174**	**0.1631**	**0.2770**	**4.3000e-004**		**7.9500e-003**	**7.9500e-003**		**7.3200e-003**	**7.3200e-003**	**0.0000**	**38.0365**	**38.0365**	**0.0123**	**0.0000**	**38.3441**

3.4 Paving - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.4000e-004	4.0000e-004	5.5400e-003	2.0000e-005	2.2500e-003	1.0000e-005	2.2600e-003	6.0000e-004	1.0000e-005	6.1000e-004	0.0000	1.6803	1.6803	4.0000e-005	4.0000e-005	1.6940
Total	**6.4000e-004**	**4.0000e-004**	**5.5400e-003**	**2.0000e-005**	**2.2500e-003**	**1.0000e-005**	**2.2600e-003**	**6.0000e-004**	**1.0000e-005**	**6.1000e-004**	**0.0000**	**1.6803**	**1.6803**	**4.0000e-005**	**4.0000e-005**	**1.6940**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1525	1.3904	1.7934	3.0100e-003		0.0588	0.0588		0.0553	0.0553	0.0000	258.5902	258.5902	0.0608	0.0000	260.1099
Total	**0.1525**	**1.3904**	**1.7934**	**3.0100e-003**		**0.0588**	**0.0588**		**0.0553**	**0.0553**	**0.0000**	**258.5902**	**258.5902**	**0.0608**	**0.0000**	**260.1099**

3.5 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7000e-003	0.1186	0.0358	5.2000e-004	0.0176	7.0000e-004	0.0183	5.0800e-003	6.7000e-004	5.7500e-003	0.0000	51.0751	51.0751	1.0700e-003	7.5500e-003	53.3519
Worker	0.0168	0.0105	0.1453	4.7000e-004	0.0590	2.8000e-004	0.0593	0.0157	2.6000e-004	0.0160	0.0000	44.0455	44.0455	1.1000e-003	1.1100e-003	44.4034
Total	**0.0195**	**0.1291**	**0.1811**	**9.9000e-004**	**0.0766**	**9.8000e-004**	**0.0776**	**0.0208**	**9.3000e-004**	**0.0217**	**0.0000**	**95.1206**	**95.1206**	**2.1700e-003**	**8.6600e-003**	**97.7553**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1525	1.3904	1.7934	3.0100e-003		0.0588	0.0588		0.0553	0.0553	0.0000	258.5899	258.5899	0.0608	0.0000	260.1096
Total	**0.1525**	**1.3904**	**1.7934**	**3.0100e-003**		**0.0588**	**0.0588**		**0.0553**	**0.0553**	**0.0000**	**258.5899**	**258.5899**	**0.0608**	**0.0000**	**260.1096**

3.5 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7000e-003	0.1186	0.0358	5.2000e-004	0.0176	7.0000e-004	0.0183	5.0800e-003	6.7000e-004	5.7500e-003	0.0000	51.0751	51.0751	1.0700e-003	7.5500e-003	53.3519
Worker	0.0168	0.0105	0.1453	4.7000e-004	0.0590	2.8000e-004	0.0593	0.0157	2.6000e-004	0.0160	0.0000	44.0455	44.0455	1.1000e-003	1.1100e-003	44.4034
Total	**0.0195**	**0.1291**	**0.1811**	**9.9000e-004**	**0.0766**	**9.8000e-004**	**0.0776**	**0.0208**	**9.3000e-004**	**0.0217**	**0.0000**	**95.1206**	**95.1206**	**2.1700e-003**	**8.6600e-003**	**97.7553**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.5 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0900e-003	0.1380	0.0413	6.0000e-004	0.0206	8.2000e-004	0.0214	5.9400e-003	7.8000e-004	6.7300e-003	0.0000	58.6834	58.6834	1.2400e-003	8.6700e-003	61.2982
Worker	0.0186	0.0112	0.1609	5.3000e-004	0.0691	3.1000e-004	0.0694	0.0184	2.8000e-004	0.0187	0.0000	50.3796	50.3796	1.1700e-003	1.2300e-003	50.7744
Total	**0.0217**	**0.1492**	**0.2022**	**1.1300e-003**	**0.0896**	**1.1300e-003**	**0.0908**	**0.0243**	**1.0600e-003**	**0.0254**	**0.0000**	**109.0630**	**109.0630**	**2.4100e-003**	**9.9000e-003**	**112.0726**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

3.5 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0900e-003	0.1380	0.0413	6.0000e-004	0.0206	8.2000e-004	0.0214	5.9400e-003	7.8000e-004	6.7300e-003	0.0000	58.6834	58.6834	1.2400e-003	8.6700e-003	61.2982
Worker	0.0186	0.0112	0.1609	5.3000e-004	0.0691	3.1000e-004	0.0694	0.0184	2.8000e-004	0.0187	0.0000	50.3796	50.3796	1.1700e-003	1.2300e-003	50.7744
Total	**0.0217**	**0.1492**	**0.2022**	**1.1300e-003**	**0.0896**	**1.1300e-003**	**0.0908**	**0.0243**	**1.0600e-003**	**0.0254**	**0.0000**	**109.0630**	**109.0630**	**2.4100e-003**	**9.9000e-003**	**112.0726**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.5 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0300e-003	0.1370	0.0408	5.9000e-004	0.0206	8.1000e-004	0.0214	5.9400e-003	7.8000e-004	6.7200e-003	0.0000	57.5006	57.5006	1.2300e-003	8.4900e-003	60.0620
Worker	0.0177	0.0103	0.1530	5.1000e-004	0.0691	2.9000e-004	0.0694	0.0184	2.7000e-004	0.0187	0.0000	49.3172	49.3172	1.0800e-003	1.1700e-003	49.6920
Total	**0.0207**	**0.1473**	**0.1938**	**1.1000e-003**	**0.0896**	**1.1000e-003**	**0.0907**	**0.0243**	**1.0500e-003**	**0.0254**	**0.0000**	**106.8178**	**106.8178**	**2.3100e-003**	**9.6600e-003**	**109.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

3.5 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0300e-003	0.1370	0.0408	5.9000e-004	0.0206	8.1000e-004	0.0214	5.9400e-003	7.8000e-004	6.7200e-003	0.0000	57.5006	57.5006	1.2300e-003	8.4900e-003	60.0620
Worker	0.0177	0.0103	0.1530	5.1000e-004	0.0691	2.9000e-004	0.0694	0.0184	2.7000e-004	0.0187	0.0000	49.3172	49.3172	1.0800e-003	1.1700e-003	49.6920
Total	**0.0207**	**0.1473**	**0.1938**	**1.1000e-003**	**0.0896**	**1.1000e-003**	**0.0907**	**0.0243**	**1.0500e-003**	**0.0254**	**0.0000**	**106.8178**	**106.8178**	**2.3100e-003**	**9.6600e-003**	**109.7539**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4953	301.4953	0.0709	0.0000	303.2671
Total	**0.1778**	**1.6211**	**2.0910**	**3.5000e-003**		**0.0686**	**0.0686**		**0.0645**	**0.0645**	**0.0000**	**301.4953**	**301.4953**	**0.0709**	**0.0000**	**303.2671**

3.5 Building Construction - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.9700e-003	0.1357	0.0403	5.8000e-004	0.0205	8.0000e-004	0.0213	5.9200e-003	7.7000e-004	6.6900e-003	0.0000	56.1424	56.1424	1.2200e-003	8.2900e-003	58.6421
Worker	0.0167	9.4900e-003	0.1459	5.0000e-004	0.0688	2.7000e-004	0.0691	0.0183	2.5000e-004	0.0186	0.0000	48.1890	48.1890	9.9000e-004	1.1100e-003	48.5455
Total	**0.0197**	**0.1452**	**0.1861**	**1.0800e-003**	**0.0893**	**1.0700e-003**	**0.0904**	**0.0242**	**1.0200e-003**	**0.0253**	**0.0000**	**104.3314**	**104.3314**	**2.2100e-003**	**9.4000e-003**	**107.1876**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4949	301.4949	0.0709	0.0000	303.2667
Total	**0.1778**	**1.6211**	**2.0910**	**3.5000e-003**		**0.0686**	**0.0686**		**0.0645**	**0.0645**	**0.0000**	**301.4949**	**301.4949**	**0.0709**	**0.0000**	**303.2667**

3.5 Building Construction - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.9700e-003	0.1357	0.0403	5.8000e-004	0.0205	8.0000e-004	0.0213	5.9200e-003	7.7000e-004	6.6900e-003	0.0000	56.1424	56.1424	1.2200e-003	8.2900e-003	58.6421
Worker	0.0167	9.4900e-003	0.1459	5.0000e-004	0.0688	2.7000e-004	0.0691	0.0183	2.5000e-004	0.0186	0.0000	48.1890	48.1890	9.9000e-004	1.1100e-003	48.5455
Total	**0.0197**	**0.1452**	**0.1861**	**1.0800e-003**	**0.0893**	**1.0700e-003**	**0.0904**	**0.0242**	**1.0200e-003**	**0.0253**	**0.0000**	**104.3314**	**104.3314**	**2.2100e-003**	**9.4000e-003**	**107.1876**

3.5 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0718	0.6547	0.8444	1.4200e-003		0.0277	0.0277		0.0261	0.0261	0.0000	121.7577	121.7577	0.0286	0.0000	122.4733
Total	**0.0718**	**0.6547**	**0.8444**	**1.4200e-003**		**0.0277**	**0.0277**		**0.0261**	**0.0261**	**0.0000**	**121.7577**	**121.7577**	**0.0286**	**0.0000**	**122.4733**

3.5 Building Construction - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1800e-003	0.0542	0.0161	2.3000e-004	8.2700e-003	3.2000e-004	8.5900e-003	2.3900e-003	3.1000e-004	2.7000e-003	0.0000	22.1489	22.1489	4.9000e-004	3.2700e-003	23.1344
Worker	6.3800e-003	3.5700e-003	0.0566	2.0000e-004	0.0278	1.0000e-004	0.0279	7.3900e-003	9.0000e-005	7.4900e-003	0.0000	19.1220	19.1220	3.7000e-004	4.3000e-004	19.2602
Total	**7.5600e-003**	**0.0578**	**0.0727**	**4.3000e-004**	**0.0361**	**4.2000e-004**	**0.0365**	**9.7800e-003**	**4.0000e-004**	**0.0102**	**0.0000**	**41.2708**	**41.2708**	**8.6000e-004**	**3.7000e-003**	**42.3945**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0718	0.6547	0.8444	1.4200e-003		0.0277	0.0277		0.0261	0.0261	0.0000	121.7576	121.7576	0.0286	0.0000	122.4731
Total	**0.0718**	**0.6547**	**0.8444**	**1.4200e-003**		**0.0277**	**0.0277**		**0.0261**	**0.0261**	**0.0000**	**121.7576**	**121.7576**	**0.0286**	**0.0000**	**122.4731**

3.5 Building Construction - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1800e-003	0.0542	0.0161	2.3000e-004	8.2700e-003	3.2000e-004	8.5900e-003	2.3900e-003	3.1000e-004	2.7000e-003	0.0000	22.1489	22.1489	4.9000e-004	3.2700e-003	23.1344
Worker	6.3800e-003	3.5700e-003	0.0566	2.0000e-004	0.0278	1.0000e-004	0.0279	7.3900e-003	9.0000e-005	7.4900e-003	0.0000	19.1220	19.1220	3.7000e-004	4.3000e-004	19.2602
Total	**7.5600e-003**	**0.0578**	**0.0727**	**4.3000e-004**	**0.0361**	**4.2000e-004**	**0.0365**	**9.7800e-003**	**4.0000e-004**	**0.0102**	**0.0000**	**41.2708**	**41.2708**	**8.6000e-004**	**3.7000e-003**	**42.3945**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3742					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0182	0.1220	0.1927	3.2000e-004		5.4900e-003	5.4900e-003		5.4900e-003	5.4900e-003	0.0000	27.1922	27.1922	1.4800e-003	0.0000	27.2292
Total	**0.3924**	**0.1220**	**0.1927**	**3.2000e-004**		**5.4900e-003**	**5.4900e-003**		**5.4900e-003**	**5.4900e-003**	**0.0000**	**27.1922**	**27.1922**	**1.4800e-003**	**0.0000**	**27.2292**

3.6 Architectural Coating - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1200e-003	1.9500e-003	0.0269	9.0000e-005	0.0109	5.0000e-005	0.0110	2.9100e-003	5.0000e-005	2.9600e-003	0.0000	8.1629	8.1629	2.0000e-004	2.1000e-004	8.2292
Total	**3.1200e-003**	**1.9500e-003**	**0.0269**	**9.0000e-005**	**0.0109**	**5.0000e-005**	**0.0110**	**2.9100e-003**	**5.0000e-005**	**2.9600e-003**	**0.0000**	**8.1629**	**8.1629**	**2.0000e-004**	**2.1000e-004**	**8.2292**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3742					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0182	0.1220	0.1927	3.2000e-004		5.4900e-003	5.4900e-003		5.4900e-003	5.4900e-003	0.0000	27.1921	27.1921	1.4800e-003	0.0000	27.2292
Total	**0.3924**	**0.1220**	**0.1927**	**3.2000e-004**		**5.4900e-003**	**5.4900e-003**		**5.4900e-003**	**5.4900e-003**	**0.0000**	**27.1921**	**27.1921**	**1.4800e-003**	**0.0000**	**27.2292**

3.6 Architectural Coating - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1200e-003	1.9500e-003	0.0269	9.0000e-005	0.0109	5.0000e-005	0.0110	2.9100e-003	5.0000e-005	2.9600e-003	0.0000	8.1629	8.1629	2.0000e-004	2.1000e-004	8.2292
Total	**3.1200e-003**	**1.9500e-003**	**0.0269**	**9.0000e-005**	**0.0109**	**5.0000e-005**	**0.0110**	**2.9100e-003**	**5.0000e-005**	**2.9600e-003**	**0.0000**	**8.1629**	**8.1629**	**2.0000e-004**	**2.1000e-004**	**8.2292**

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4585					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3200	33.3200	1.8200e-003	0.0000	33.3654
Total	**0.4808**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3200**	**33.3200**	**1.8200e-003**	**0.0000**	**33.3654**

3.6 Architectural Coating - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6100e-003	2.1800e-003	0.0312	1.0000e-004	0.0134	6.0000e-005	0.0135	3.5700e-003	6.0000e-005	3.6200e-003	0.0000	9.7751	9.7751	2.3000e-004	2.4000e-004	9.8518
Total	**3.6100e-003**	**2.1800e-003**	**0.0312**	**1.0000e-004**	**0.0134**	**6.0000e-005**	**0.0135**	**3.5700e-003**	**6.0000e-005**	**3.6200e-003**	**0.0000**	**9.7751**	**9.7751**	**2.3000e-004**	**2.4000e-004**	**9.8518**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4585					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3199	33.3199	1.8200e-003	0.0000	33.3654
Total	**0.4808**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3199**	**33.3199**	**1.8200e-003**	**0.0000**	**33.3654**

3.6 Architectural Coating - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6100e-003	2.1800e-003	0.0312	1.0000e-004	0.0134	6.0000e-005	0.0135	3.5700e-003	6.0000e-005	3.6200e-003	0.0000	9.7751	9.7751	2.3000e-004	2.4000e-004	9.8518
Total	**3.6100e-003**	**2.1800e-003**	**0.0312**	**1.0000e-004**	**0.0134**	**6.0000e-005**	**0.0135**	**3.5700e-003**	**6.0000e-005**	**3.6200e-003**	**0.0000**	**9.7751**	**9.7751**	**2.3000e-004**	**2.4000e-004**	**9.8518**

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4585					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3200	33.3200	1.8200e-003	0.0000	33.3654
Total	**0.4808**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3200**	**33.3200**	**1.8200e-003**	**0.0000**	**33.3654**

3.6 Architectural Coating - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4300e-003	2.0000e-003	0.0297	1.0000e-004	0.0134	6.0000e-005	0.0135	3.5700e-003	5.0000e-005	3.6200e-003	0.0000	9.5690	9.5690	2.1000e-004	2.3000e-004	9.6417
Total	**3.4300e-003**	**2.0000e-003**	**0.0297**	**1.0000e-004**	**0.0134**	**6.0000e-005**	**0.0135**	**3.5700e-003**	**5.0000e-005**	**3.6200e-003**	**0.0000**	**9.5690**	**9.5690**	**2.1000e-004**	**2.3000e-004**	**9.6417**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4585					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3199	33.3199	1.8200e-003	0.0000	33.3654
Total	**0.4808**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3199**	**33.3199**	**1.8200e-003**	**0.0000**	**33.3654**

3.6 Architectural Coating - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4300e-003	2.0000e-003	0.0297	1.0000e-004	0.0134	6.0000e-005	0.0135	3.5700e-003	5.0000e-005	3.6200e-003	0.0000	9.5690	9.5690	2.1000e-004	2.3000e-004	9.6417
Total	**3.4300e-003**	**2.0000e-003**	**0.0297**	**1.0000e-004**	**0.0134**	**6.0000e-005**	**0.0135**	**3.5700e-003**	**5.0000e-005**	**3.6200e-003**	**0.0000**	**9.5690**	**9.5690**	**2.1000e-004**	**2.3000e-004**	**9.6417**

3.6 Architectural Coating - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4567					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0222	0.1489	0.2352	3.9000e-004		6.7000e-003	6.7000e-003		6.7000e-003	6.7000e-003	0.0000	33.1923	33.1923	1.8100e-003	0.0000	33.2376
Total	**0.4790**	**0.1489**	**0.2352**	**3.9000e-004**		**6.7000e-003**	**6.7000e-003**		**6.7000e-003**	**6.7000e-003**	**0.0000**	**33.1923**	**33.1923**	**1.8100e-003**	**0.0000**	**33.2376**

3.6 Architectural Coating - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2400e-003	1.8400e-003	0.0283	1.0000e-004	0.0134	5.0000e-005	0.0134	3.5500e-003	5.0000e-005	3.6000e-003	0.0000	9.3501	9.3501	1.9000e-004	2.2000e-004	9.4193
Total	**3.2400e-003**	**1.8400e-003**	**0.0283**	**1.0000e-004**	**0.0134**	**5.0000e-005**	**0.0134**	**3.5500e-003**	**5.0000e-005**	**3.6000e-003**	**0.0000**	**9.3501**	**9.3501**	**1.9000e-004**	**2.2000e-004**	**9.4193**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4567					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0222	0.1489	0.2352	3.9000e-004		6.7000e-003	6.7000e-003		6.7000e-003	6.7000e-003	0.0000	33.1923	33.1923	1.8100e-003	0.0000	33.2375
Total	**0.4790**	**0.1489**	**0.2352**	**3.9000e-004**		**6.7000e-003**	**6.7000e-003**		**6.7000e-003**	**6.7000e-003**	**0.0000**	**33.1923**	**33.1923**	**1.8100e-003**	**0.0000**	**33.2375**

3.6 Architectural Coating - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2400e-003	1.8400e-003	0.0283	1.0000e-004	0.0134	5.0000e-005	0.0134	3.5500e-003	5.0000e-005	3.6000e-003	0.0000	9.3501	9.3501	1.9000e-004	2.2000e-004	9.4193
Total	**3.2400e-003**	**1.8400e-003**	**0.0283**	**1.0000e-004**	**0.0134**	**5.0000e-005**	**0.0134**	**3.5500e-003**	**5.0000e-005**	**3.6000e-003**	**0.0000**	**9.3501**	**9.3501**	**1.9000e-004**	**2.2000e-004**	**9.4193**

3.6 Architectural Coating - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2020					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.8200e-003	0.0659	0.1040	1.7000e-004		2.9600e-003	2.9600e-003		2.9600e-003	2.9600e-003	0.0000	14.6812	14.6812	8.0000e-004	0.0000	14.7012
Total	**0.2118**	**0.0659**	**0.1040**	**1.7000e-004**		**2.9600e-003**	**2.9600e-003**		**2.9600e-003**	**2.9600e-003**	**0.0000**	**14.6812**	**14.6812**	**8.0000e-004**	**0.0000**	**14.7012**

3.6 Architectural Coating - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3600e-003	7.6000e-004	0.0120	4.0000e-005	5.9100e-003	2.0000e-005	5.9300e-003	1.5700e-003	2.0000e-005	1.5900e-003	0.0000	4.0636	4.0636	8.0000e-005	9.0000e-005	4.0930
Total	**1.3600e-003**	**7.6000e-004**	**0.0120**	**4.0000e-005**	**5.9100e-003**	**2.0000e-005**	**5.9300e-003**	**1.5700e-003**	**2.0000e-005**	**1.5900e-003**	**0.0000**	**4.0636**	**4.0636**	**8.0000e-005**	**9.0000e-005**	**4.0930**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2020					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.8200e-003	0.0659	0.1040	1.7000e-004		2.9600e-003	2.9600e-003		2.9600e-003	2.9600e-003	0.0000	14.6812	14.6812	8.0000e-004	0.0000	14.7012
Total	**0.2118**	**0.0659**	**0.1040**	**1.7000e-004**		**2.9600e-003**	**2.9600e-003**		**2.9600e-003**	**2.9600e-003**	**0.0000**	**14.6812**	**14.6812**	**8.0000e-004**	**0.0000**	**14.7012**

3.6 Architectural Coating - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3600e-003	7.6000e-004	0.0120	4.0000e-005	5.9100e-003	2.0000e-005	5.9300e-003	1.5700e-003	2.0000e-005	1.5900e-003	0.0000	4.0636	4.0636	8.0000e-005	9.0000e-005	4.0930
Total	**1.3600e-003**	**7.6000e-004**	**0.0120**	**4.0000e-005**	**5.9100e-003**	**2.0000e-005**	**5.9300e-003**	**1.5700e-003**	**2.0000e-005**	**1.5900e-003**	**0.0000**	**4.0636**	**4.0636**	**8.0000e-005**	**9.0000e-005**	**4.0930**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Regional Shopping Center	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	154.8572	154.8572	0.0251	3.0400e-003	156.3884
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	154.8572	154.8572	0.0251	3.0400e-003	156.3884
NaturalGas Mitigated	0.0191	0.1633	0.0726	1.0400e-003		0.0132	0.0132		0.0132	0.0132	0.0000	188.6329	188.6329	3.6200e-003	3.4600e-003	189.7539
NaturalGas Unmitigated	0.0191	0.1633	0.0726	1.0400e-003		0.0132	0.0132		0.0132	0.0132	0.0000	188.6329	188.6329	3.6200e-003	3.4600e-003	189.7539

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Regional Shopping Center	152896	8.2000e-004	7.4900e-003	6.3000e-003	4.0000e-005		5.7000e-004	5.7000e-004		5.7000e-004	5.7000e-004	0.0000	8.1591	8.1591	1.6000e-004	1.5000e-004	8.2076
Single Family Housing	3.38195e+006	0.0182	0.1558	0.0663	9.9000e-004		0.0126	0.0126		0.0126	0.0126	0.0000	180.4738	180.4738	3.4600e-003	3.3100e-003	181.5463
Total		**0.0191**	**0.1633**	**0.0726**	**1.0300e-003**		**0.0132**	**0.0132**		**0.0132**	**0.0132**	**0.0000**	**188.6329**	**188.6329**	**3.6200e-003**	**3.4600e-003**	**189.7539**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Regional Shopping Center	152896	8.2000e-004	7.4900e-003	6.3000e-003	4.0000e-005		5.7000e-004	5.7000e-004		5.7000e-004	5.7000e-004	0.0000	8.1591	8.1591	1.6000e-004	1.5000e-004	8.2076
Single Family Housing	3.38195e+006	0.0182	0.1558	0.0663	9.9000e-004		0.0126	0.0126		0.0126	0.0126	0.0000	180.4738	180.4738	3.4600e-003	3.3100e-003	181.5463
Total		**0.0191**	**0.1633**	**0.0726**	**1.0300e-003**		**0.0132**	**0.0132**		**0.0132**	**0.0132**	**0.0000**	**188.6329**	**188.6329**	**3.6200e-003**	**3.4600e-003**	**189.7539**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Regional Shopping Center	678883	62.8128	0.0102	1.2300e-003	63.4339
Single Family Housing	994819	92.0444	0.0149	1.8000e-003	92.9546
Total		**154.8572**	**0.0251**	**3.0300e-003**	**156.3885**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Regional Shopping Center	678883	62.8128	0.0102	1.2300e-003	63.4339
Single Family Housing	994819	92.0444	0.0149	1.8000e-003	92.9546
Total		**154.8572**	**0.0251**	**3.0300e-003**	**156.3885**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.4041	0.0157	1.2407	1.0200e-003		0.0538	0.0538		0.0538	0.0538	6.5083	1.5415	8.0498	0.0319	0.0000	8.8474
Unmitigated	1.4041	0.0157	1.2407	1.0200e-003		0.0538	0.0538		0.0538	0.0538	6.5083	1.5415	8.0498	0.0319	0.0000	8.8474

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1950					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.1480					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0328	4.8600e-003	0.2980	9.7000e-004		0.0486	0.0486		0.0486	0.0486	6.5083	0.0000	6.5083	0.0304	0.0000	7.2689
Landscaping	0.0283	0.0109	0.9427	5.0000e-005		5.2300e-003	5.2300e-003		5.2300e-003	5.2300e-003	0.0000	1.5415	1.5415	1.4800e-003	0.0000	1.5785
Total	**1.4041**	**0.0157**	**1.2406**	**1.0200e-003**		**0.0538**	**0.0538**		**0.0538**	**0.0538**	**6.5083**	**1.5415**	**8.0498**	**0.0319**	**0.0000**	**8.8474**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1950					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.1480					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0328	4.8600e-003	0.2980	9.7000e-004		0.0486	0.0486		0.0486	0.0486	6.5083	0.0000	6.5083	0.0304	0.0000	7.2689
Landscaping	0.0283	0.0109	0.9427	5.0000e-005		5.2300e-003	5.2300e-003		5.2300e-003	5.2300e-003	0.0000	1.5415	1.5415	1.4800e-003	0.0000	1.5785
Total	**1.4041**	**0.0157**	**1.2406**	**1.0200e-003**		**0.0538**	**0.0538**		**0.0538**	**0.0538**	**6.5083**	**1.5415**	**8.0498**	**0.0319**	**0.0000**	**8.8474**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	13.3762	0.4288	0.0103	27.1576
Unmitigated	13.3762	0.4288	0.0103	27.1576

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Regional Shopping Center	4.8399 / 2.96639	4.9192	0.1583	3.7900e-003	10.0050
Single Family Housing	8.27456 / 5.21657	8.4571	0.2706	6.4800e-003	17.1526
Total		**13.3762**	**0.4288**	**0.0103**	**27.1576**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Regional Shopping Center	4.8399 / 2.96639	4.9192	0.1583	3.7900e-003	10.0050
Single Family Housing	8.27456 / 5.21657	8.4571	0.2706	6.4800e-003	17.1526
Total		**13.3762**	**0.4288**	**0.0103**	**27.1576**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	44.8752	2.6521	0.0000	111.1764
Unmitigated	44.8752	2.6521	0.0000	111.1764

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Regional Shopping Center	68.61	13.9272	0.8231	0.0000	34.5041
Single Family Housing	152.46	30.9480	1.8290	0.0000	76.6724
Total		**44.8752**	**2.6520**	**0.0000**	**111.1764**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Regional Shopping Center	68.61	13.9272	0.8231	0.0000	34.5041
Single Family Housing	152.46	30.9480	1.8290	0.0000	76.6724
Total		**44.8752**	**2.6520**	**0.0000**	**111.1764**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch - Existing Land Use Designation Alternative

Bay Area AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	127.00	Dwelling Unit	63.70	228,600.00	363
Regional Shopping Center	65.34	1000sqft	3.00	65,340.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site dimensions.

Construction Phase - Grading phase timing adjusted to accomodate soil import.

Grading - Material export updated per site-specific information.

Vehicle Trips - Operational emissions not modeled.

Woodstoves - Operational emissions not modeled.

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	75.00	1,110.00
tblConstructionPhase	NumDays	110.00	120.00
tblFireplaces	NumberGas	31.75	0.00
tblFireplaces	NumberWood	54.61	0.00
tblGrading	MaterialImported	0.00	300,000.00
tblLandUse	LotAcreage	41.23	63.70
tblLandUse	LotAcreage	1.50	3.00
tblVehicleTrips	ST_TR	46.12	0.00
tblVehicleTrips	ST_TR	9.54	0.00
tblVehicleTrips	SU_TR	21.10	0.00
tblVehicleTrips	SU_TR	8.55	0.00
tblVehicleTrips	WD_TR	37.75	0.00
tblVehicleTrips	WD_TR	9.44	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.9350	73.2659	38.1418	0.2489	19.8049	1.6817	21.0349	10.1417	1.5599	11.2733	0.0000	26,381.7992	26,381.7992	2.6244	3.2094	27,403.7961
2025	5.2662	14.7412	19.8803	0.0400	0.8197	0.5883	1.4081	0.2211	0.5565	0.7776	0.0000	3,897.4963	3,897.4963	0.7160	0.0866	3,939.2908
2026	5.2551	14.7263	19.7829	0.0397	0.8197	0.5881	1.4079	0.2211	0.5563	0.7775	0.0000	3,875.5839	3,875.5839	0.6378	0.0846	3,916.7336
2027	5.2450	14.7116	19.7004	0.0395	0.8197	0.5879	1.4077	0.2211	0.5562	0.7773	0.0000	3,854.1247	3,854.1247	0.6368	0.0825	3,894.6364
2028	5.2357	14.6996	19.6318	0.0392	0.8198	0.5877	1.4075	0.2211	0.5560	0.7771	0.0000	3,834.3111	3,834.3111	0.6360	0.0806	3,874.2266
2029	5.2267	14.6829	19.5714	0.0390	0.8198	0.5875	1.4072	0.2211	0.5557	0.7769	0.0000	3,814.2371	3,814.2371	0.6352	0.0785	3,853.5162
Maximum	**5.2662**	**73.2659**	**38.1418**	**0.2489**	**19.8049**	**1.6817**	**21.0349**	**10.1417**	**1.5599**	**11.2733**	**0.0000**	**26,381.7992**	**26,381.7992**	**2.6244**	**3.2094**	**27,403.7961**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.9350	73.2659	38.1418	0.2489	19.8049	1.6817	21.0349	10.1417	1.5599	11.2733	0.0000	26,381.7992	26,381.7992	2.6244	3.2094	27,403.7961
2025	5.2662	14.7412	19.8803	0.0400	0.8197	0.5883	1.4081	0.2211	0.5565	0.7776	0.0000	3,897.4963	3,897.4963	0.7160	0.0866	3,939.2908
2026	5.2551	14.7263	19.7829	0.0397	0.8197	0.5881	1.4079	0.2211	0.5563	0.7775	0.0000	3,875.5839	3,875.5839	0.6378	0.0846	3,916.7336
2027	5.2450	14.7116	19.7004	0.0395	0.8197	0.5879	1.4077	0.2211	0.5562	0.7773	0.0000	3,854.1247	3,854.1247	0.6368	0.0825	3,894.6364
2028	5.2357	14.6996	19.6318	0.0392	0.8198	0.5877	1.4075	0.2211	0.5560	0.7771	0.0000	3,834.3111	3,834.3111	0.6360	0.0806	3,874.2266
2029	5.2267	14.6829	19.5714	0.0390	0.8198	0.5875	1.4072	0.2211	0.5557	0.7769	0.0000	3,814.2371	3,814.2371	0.6352	0.0785	3,853.5162
Maximum	**5.2662**	**73.2659**	**38.1418**	**0.2489**	**19.8049**	**1.6817**	**21.0349**	**10.1417**	**1.5599**	**11.2733**	**0.0000**	**26,381.7992**	**26,381.7992**	**2.6244**	**3.2094**	**27,403.7961**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	10.7894	0.5822	38.7699	0.0929		4.6740	4.6740		4.6740	4.6740	681.3070	18.8804	700.1875	3.2031	0.0000	780.2644
Energy	0.1044	0.8950	0.3979	5.7000e-003		0.0722	0.0722		0.0722	0.0722		1,139.3545	1,139.3545	0.0218	0.0209	1,146.1251
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**10.8938**	**1.4772**	**39.1677**	**0.0986**	**0.0000**	**4.7462**	**4.7462**	**0.0000**	**4.7462**	**4.7462**	**681.3070**	**1,158.2349**	**1,839.5419**	**3.2249**	**0.0209**	**1,926.3894**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	10.7894	0.5822	38.7699	0.0929		4.6740	4.6740		4.6740	4.6740	681.3070	18.8804	700.1875	3.2031	0.0000	780.2644
Energy	0.1044	0.8950	0.3979	5.7000e-003		0.0722	0.0722		0.0722	0.0722		1,139.3545	1,139.3545	0.0218	0.0209	1,146.1251
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**10.8938**	**1.4772**	**39.1677**	**0.0986**	**0.0000**	**4.7462**	**4.7462**	**0.0000**	**4.7462**	**4.7462**	**681.3070**	**1,158.2349**	**1,839.5419**	**3.2249**	**0.0209**	**1,926.3894**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/24/2024	5	40	
2	Grading	Grading	5/25/2024	11/8/2024	5	120	
3	Paving	Paving	11/9/2024	2/21/2025	5	75	
4	Building Construction	Building Construction	2/22/2025	5/25/2029	5	1110	
5	Architectural Coating	Architectural Coating	3/8/2025	6/8/2029	5	1110	

Acres of Grading (Site Preparation Phase): 60

Acres of Grading (Grading Phase): 360

Acres of Paving: 0

Residential Indoor: 462,915; Residential Outdoor: 154,305; Non-Residential Indoor: 98,010; Non-Residential Outdoor: 32,670; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	67.00	24.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310		3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**		**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0455	0.0250	0.4010	1.2400e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		127.9370	127.9370	2.9900e-003	2.9000e-003	128.8764
Total	**0.0455**	**0.0250**	**0.4010**	**1.2400e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**127.9370**	**127.9370**	**2.9900e-003**	**2.9000e-003**	**128.8764**

3.2 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310	0.0000	3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**	**0.0000**	**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0455	0.0250	0.4010	1.2400e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		127.9370	127.9370	2.9900e-003	2.9000e-003	128.8764
Total	**0.0455**	**0.0250**	**0.4010**	**1.2400e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**127.9370**	**127.9370**	**2.9900e-003**	**2.9000e-003**	**128.8764**

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286		6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**		**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6663	40.8612	9.9734	0.1854	5.4661	0.3455	5.8117	1.4983	0.3306	1.8289		20,229.8983	20,229.8983	0.6774	3.2061	21,202.2596
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0505	0.0278	0.4456	1.3800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		142.1522	142.1522	3.3200e-003	3.2200e-003	143.1960
Total	**0.7169**	**40.8890**	**10.4190**	**0.1868**	**5.6304**	**0.3463**	**5.9767**	**1.5419**	**0.3313**	**1.8732**		**20,372.0505**	**20,372.0505**	**0.6807**	**3.2094**	**21,345.4556**

3.3 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286	0.0000	6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**	**0.0000**	**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6663	40.8612	9.9734	0.1854	5.4661	0.3455	5.8117	1.4983	0.3306	1.8289		20,229.8983	20,229.8983	0.6774	3.2061	21,202.2596
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0505	0.0278	0.4456	1.3800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		142.1522	142.1522	3.3200e-003	3.2200e-003	143.1960
Total	**0.7169**	**40.8890**	**10.4190**	**0.1868**	**5.6304**	**0.3463**	**5.9767**	**1.5419**	**0.3313**	**1.8732**		**20,372.0505**	**20,372.0505**	**0.6807**	**3.2094**	**21,345.4556**

3.4 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.547 2	2,207.547 2	0.7140		2,225.396 3
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.547 2**	**2,207.547 2**	**0.7140**		**2,225.396 3**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0379	0.0208	0.3342	1.0300e-003	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		106.6142	106.6142	2.4900e-003	2.4200e-003	107.3970
Total	**0.0379**	**0.0208**	**0.3342**	**1.0300e-003**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**106.6142**	**106.6142**	**2.4900e-003**	**2.4200e-003**	**107.3970**

3.4 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310	0.0000	2,207.547 2	2,207.547 2	0.7140		2,225.396 3
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**	**0.0000**	**2,207.547 2**	**2,207.547 2**	**0.7140**		**2,225.396 3**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0379	0.0208	0.3342	1.0300e-003	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		106.6142	106.6142	2.4900e-003	2.4200e-003	107.3970
Total	**0.0379**	**0.0208**	**0.3342**	**1.0300e-003**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**106.6142**	**106.6142**	**2.4900e-003**	**2.4200e-003**	**107.3970**

3.4 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0356	0.0188	0.3132	1.0000e-003	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		104.0533	104.0533	2.2600e-003	2.2700e-003	104.7853
Total	**0.0356**	**0.0188**	**0.3132**	**1.0000e-003**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**104.0533**	**104.0533**	**2.2600e-003**	**2.2700e-003**	**104.7853**

3.4 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850	0.0000	2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**	**0.0000**	**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0356	0.0188	0.3132	1.0000e-003	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		104.0533	104.0533	2.2600e-003	2.2700e-003	104.7853
Total	**0.0356**	**0.0188**	**0.3132**	**1.0000e-003**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**104.0533**	**104.0533**	**2.2600e-003**	**2.2700e-003**	**104.7853**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0248	1.0260	0.3160	4.7000e-003	0.1626	6.2800e-003	0.1688	0.0468	6.0100e-003	0.0528		504.6232	504.6232	0.0106	0.0746	527.1060
Worker	0.1590	0.0838	1.3990	4.4600e-003	0.5504	2.4900e-003	0.5529	0.1460	2.2900e-003	0.1483		464.7712	464.7712	0.0101	0.0101	468.0409
Total	**0.1838**	**1.1098**	**1.7150**	**9.1600e-003**	**0.7130**	**8.7700e-003**	**0.7217**	**0.1928**	**8.3000e-003**	**0.2011**		**969.3944**	**969.3944**	**0.0207**	**0.0847**	**995.1469**

3.5 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0248	1.0260	0.3160	4.7000e-003	0.1626	6.2800e-003	0.1688	0.0468	6.0100e-003	0.0528		504.6232	504.6232	0.0106	0.0746	527.1060
Worker	0.1590	0.0838	1.3990	4.4600e-003	0.5504	2.4900e-003	0.5529	0.1460	2.2900e-003	0.1483		464.7712	464.7712	0.0101	0.0101	468.0409
Total	**0.1838**	**1.1098**	**1.7150**	**9.1600e-003**	**0.7130**	**8.7700e-003**	**0.7217**	**0.1928**	**8.3000e-003**	**0.2011**		**969.3944**	**969.3944**	**0.0207**	**0.0847**	**995.1469**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0242	1.0200	0.3115	4.6100e-003	0.1626	6.2500e-003	0.1688	0.0468	5.9800e-003	0.0528		495.3739	495.3739	0.0105	0.0732	517.4354
Worker	0.1502	0.0763	1.3212	4.3200e-003	0.5504	2.3700e-003	0.5528	0.1460	2.1800e-003	0.1482		454.1659	454.1659	9.2100e-003	9.5700e-003	457.2484
Total	**0.1744**	**1.0963**	**1.6327**	**8.9300e-003**	**0.7130**	**8.6200e-003**	**0.7216**	**0.1928**	**8.1600e-003**	**0.2010**		**949.5398**	**949.5398**	**0.0197**	**0.0827**	**974.6838**

3.5 Building Construction - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0242	1.0200	0.3115	4.6100e-003	0.1626	6.2500e-003	0.1688	0.0468	5.9800e-003	0.0528		495.3739	495.3739	0.0105	0.0732	517.4354
Worker	0.1502	0.0763	1.3212	4.3200e-003	0.5504	2.3700e-003	0.5528	0.1460	2.1800e-003	0.1482		454.1659	454.1659	9.2100e-003	9.5700e-003	457.2484
Total	**0.1744**	**1.0963**	**1.6327**	**8.9300e-003**	**0.7130**	**8.6200e-003**	**0.7216**	**0.1928**	**8.1600e-003**	**0.2010**		**949.5398**	**949.5398**	**0.0197**	**0.0827**	**974.6838**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0237	1.0128	0.3075	4.5200e-003	0.1626	6.2000e-003	0.1688	0.0468	5.9300e-003	0.0527		485.3838	485.3838	0.0104	0.0717	506.9946
Worker	0.1421	0.0700	1.2555	4.2000e-003	0.5504	2.2400e-003	0.5526	0.1460	2.0600e-003	0.1481		444.5605	444.5605	8.4500e-003	9.1100e-003	447.4862
Total	**0.1659**	**1.0828**	**1.5630**	**8.7200e-003**	**0.7130**	**8.4400e-003**	**0.7214**	**0.1928**	**7.9900e-003**	**0.2008**		**929.9443**	**929.9443**	**0.0189**	**0.0808**	**954.4808**

3.5 Building Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0237	1.0128	0.3075	4.5200e-003	0.1626	6.2000e-003	0.1688	0.0468	5.9300e-003	0.0527		485.3838	485.3838	0.0104	0.0717	506.9946
Worker	0.1421	0.0700	1.2555	4.2000e-003	0.5504	2.2400e-003	0.5526	0.1460	2.0600e-003	0.1481		444.5605	444.5605	8.4500e-003	9.1100e-003	447.4862
Total	**0.1659**	**1.0828**	**1.5630**	**8.7200e-003**	**0.7130**	**8.4400e-003**	**0.7214**	**0.1928**	**7.9900e-003**	**0.2008**		**929.9443**	**929.9443**	**0.0189**	**0.0808**	**954.4808**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0234	1.0070	0.3046	4.4300e-003	0.1626	6.1500e-003	0.1687	0.0468	5.8900e-003	0.0527		475.7375	475.7375	0.0104	0.0702	496.9090
Worker	0.1346	0.0648	1.2005	4.0900e-003	0.5504	2.0900e-003	0.5525	0.1460	1.9300e-003	0.1479		436.0454	436.0454	7.7900e-003	8.7200e-003	438.8397
Total	**0.1580**	**1.0718**	**1.5051**	**8.5200e-003**	**0.7130**	**8.2400e-003**	**0.7212**	**0.1928**	**7.8200e-003**	**0.2006**		**911.7829**	**911.7829**	**0.0181**	**0.0789**	**935.7487**

3.5 Building Construction - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.474 4	2,556.474 4	0.6010		2,571.498 1
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.474 4**	**2,556.474 4**	**0.6010**		**2,571.498 1**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0234	1.0070	0.3046	4.4300e-003	0.1626	6.1500e-003	0.1687	0.0468	5.8900e-003	0.0527		475.7375	475.7375	0.0104	0.0702	496.9090
Worker	0.1346	0.0648	1.2005	4.0900e-003	0.5504	2.0900e-003	0.5525	0.1460	1.9300e-003	0.1479		436.0454	436.0454	7.7900e-003	8.7200e-003	438.8397
Total	**0.1580**	**1.0718**	**1.5051**	**8.5200e-003**	**0.7130**	**8.2400e-003**	**0.7212**	**0.1928**	**7.8200e-003**	**0.2006**		**911.7829**	**911.7829**	**0.0181**	**0.0789**	**935.7487**

3.5 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0230	0.9957	0.3013	4.3300e-003	0.1626	6.0700e-003	0.1687	0.0468	5.8100e-003	0.0526		464.7377	464.7377	0.0103	0.0685	485.4061
Worker	0.1274	0.0604	1.1527	3.9900e-003	0.5504	1.9600e-003	0.5524	0.1460	1.8100e-003	0.1478		428.4458	428.4458	7.2000e-003	8.4000e-003	431.1284
Total	**0.1504**	**1.0560**	**1.4540**	**8.3200e-003**	**0.7130**	**8.0300e-003**	**0.7210**	**0.1928**	**7.6200e-003**	**0.2004**		**893.1835**	**893.1835**	**0.0175**	**0.0769**	**916.5345**

3.5 Building Construction - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0230	0.9957	0.3013	4.3300e-003	0.1626	6.0700e-003	0.1687	0.0468	5.8100e-003	0.0526		464.7377	464.7377	0.0103	0.0685	485.4061
Worker	0.1274	0.0604	1.1527	3.9900e-003	0.5504	1.9600e-003	0.5524	0.1460	1.8100e-003	0.1478		428.4458	428.4458	7.2000e-003	8.4000e-003	431.1284
Total	**0.1504**	**1.0560**	**1.4540**	**8.3200e-003**	**0.7130**	**8.0300e-003**	**0.7210**	**0.1928**	**7.6200e-003**	**0.2004**		**893.1835**	**893.1835**	**0.0175**	**0.0769**	**916.5345**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0309	0.0163	0.2715	8.7000e-004	0.1068	4.8000e-004	0.1073	0.0283	4.4000e-004	0.0288		90.1795	90.1795	1.9600e-003	1.9600e-003	90.8139
Total	**0.0309**	**0.0163**	**0.2715**	**8.7000e-004**	**0.1068**	**4.8000e-004**	**0.1073**	**0.0283**	**4.4000e-004**	**0.0288**		**90.1795**	**90.1795**	**1.9600e-003**	**1.9600e-003**	**90.8139**

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0309	0.0163	0.2715	8.7000e-004	0.1068	4.8000e-004	0.1073	0.0283	4.4000e-004	0.0288		90.1795	90.1795	1.9600e-003	1.9600e-003	90.8139
Total	**0.0309**	**0.0163**	**0.2715**	**8.7000e-004**	**0.1068**	**4.8000e-004**	**0.1073**	**0.0283**	**4.4000e-004**	**0.0288**		**90.1795**	**90.1795**	**1.9600e-003**	**1.9600e-003**	**90.8139**

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0291	0.0148	0.2564	8.4000e-004	0.1068	4.6000e-004	0.1073	0.0283	4.2000e-004	0.0288		88.1217	88.1217	1.7900e-003	1.8600e-003	88.7198
Total	**0.0291**	**0.0148**	**0.2564**	**8.4000e-004**	**0.1068**	**4.6000e-004**	**0.1073**	**0.0283**	**4.2000e-004**	**0.0288**		**88.1217**	**88.1217**	**1.7900e-003**	**1.8600e-003**	**88.7198**

3.6 Architectural Coating - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0291	0.0148	0.2564	8.4000e-004	0.1068	4.6000e-004	0.1073	0.0283	4.2000e-004	0.0288		88.1217	88.1217	1.7900e-003	1.8600e-003	88.7198
Total	**0.0291**	**0.0148**	**0.2564**	**8.4000e-004**	**0.1068**	**4.6000e-004**	**0.1073**	**0.0283**	**4.2000e-004**	**0.0288**		**88.1217**	**88.1217**	**1.7900e-003**	**1.8600e-003**	**88.7198**

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0276	0.0136	0.2436	8.1000e-004	0.1068	4.3000e-004	0.1072	0.0283	4.0000e-004	0.0287		86.2580	86.2580	1.6400e-003	1.7700e-003	86.8257
Total	**0.0276**	**0.0136**	**0.2436**	**8.1000e-004**	**0.1068**	**4.3000e-004**	**0.1072**	**0.0283**	**4.0000e-004**	**0.0287**		**86.2580**	**86.2580**	**1.6400e-003**	**1.7700e-003**	**86.8257**

3.6 Architectural Coating - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0276	0.0136	0.2436	8.1000e-004	0.1068	4.3000e-004	0.1072	0.0283	4.0000e-004	0.0287		86.2580	86.2580	1.6400e-003	1.7700e-003	86.8257
Total	**0.0276**	**0.0136**	**0.2436**	**8.1000e-004**	**0.1068**	**4.3000e-004**	**0.1072**	**0.0283**	**4.0000e-004**	**0.0287**		**86.2580**	**86.2580**	**1.6400e-003**	**1.7700e-003**	**86.8257**

3.6 Architectural Coating - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0261	0.0126	0.2329	7.9000e-004	0.1068	4.1000e-004	0.1072	0.0283	3.7000e-004	0.0287		84.6058	84.6058	1.5100e-003	1.6900e-003	85.1480
Total	**0.0261**	**0.0126**	**0.2329**	**7.9000e-004**	**0.1068**	**4.1000e-004**	**0.1072**	**0.0283**	**3.7000e-004**	**0.0287**		**84.6058**	**84.6058**	**1.5100e-003**	**1.6900e-003**	**85.1480**

3.6 Architectural Coating - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0261	0.0126	0.2329	7.9000e-004	0.1068	4.1000e-004	0.1072	0.0283	3.7000e-004	0.0287		84.6058	84.6058	1.5100e-003	1.6900e-003	85.1480
Total	**0.0261**	**0.0126**	**0.2329**	**7.9000e-004**	**0.1068**	**4.1000e-004**	**0.1072**	**0.0283**	**3.7000e-004**	**0.0287**		**84.6058**	**84.6058**	**1.5100e-003**	**1.6900e-003**	**85.1480**

3.6 Architectural Coating - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0247	0.0117	0.2237	7.7000e-004	0.1068	3.8000e-004	0.1072	0.0283	3.5000e-004	0.0287		83.1313	83.1313	1.4000e-003	1.6300e-003	83.6518
Total	**0.0247**	**0.0117**	**0.2237**	**7.7000e-004**	**0.1068**	**3.8000e-004**	**0.1072**	**0.0283**	**3.5000e-004**	**0.0287**		**83.1313**	**83.1313**	**1.4000e-003**	**1.6300e-003**	**83.6518**

3.6 Architectural Coating - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0247	0.0117	0.2237	7.7000e-004	0.1068	3.8000e-004	0.1072	0.0283	3.5000e-004	0.0287		83.1313	83.1313	1.4000e-003	1.6300e-003	83.6518
Total	**0.0247**	**0.0117**	**0.2237**	**7.7000e-004**	**0.1068**	**3.8000e-004**	**0.1072**	**0.0283**	**3.5000e-004**	**0.0287**		**83.1313**	**83.1313**	**1.4000e-003**	**1.6300e-003**	**83.6518**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Regional Shopping Center	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1044	0.8950	0.3979	5.7000e-003		0.0722	0.0722		0.0722	0.0722		1,139.3545	1,139.3545	0.0218	0.0209	1,146.1251
NaturalGas Unmitigated	0.1044	0.8950	0.3979	5.7000e-003		0.0722	0.0722		0.0722	0.0722		1,139.3545	1,139.3545	0.0218	0.0209	1,146.1251

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Regional Shopping Center	418.892	4.5200e-003	0.0411	0.0345	2.5000e-004		3.1200e-003	3.1200e-003		3.1200e-003	3.1200e-003		49.2814	49.2814	9.4000e-004	9.0000e-004	49.5743
Single Family Housing	9265.62	0.0999	0.8539	0.3634	5.4500e-003		0.0690	0.0690		0.0690	0.0690		1,090.0730	1,090.0730	0.0209	0.0200	1,096.5508
Total		**0.1044**	**0.8950**	**0.3979**	**5.7000e-003**		**0.0722**	**0.0722**		**0.0722**	**0.0722**		**1,139.3545**	**1,139.3545**	**0.0218**	**0.0209**	**1,146.1251**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Regional Shopping Center	0.418892	4.5200e-003	0.0411	0.0345	2.5000e-004		3.1200e-003	3.1200e-003		3.1200e-003	3.1200e-003		49.2814	49.2814	9.4000e-004	9.0000e-004	49.5743
Single Family Housing	9.26562	0.0999	0.8539	0.3634	5.4500e-003		0.0690	0.0690		0.0690	0.0690		1,090.0730	1,090.0730	0.0209	0.0200	1,096.5508
Total		**0.1044**	**0.8950**	**0.3979**	**5.7000e-003**		**0.0722**	**0.0722**		**0.0722**	**0.0722**		**1,139.3545**	**1,139.3545**	**0.0218**	**0.0209**	**1,146.1251**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	10.7894	0.5822	38.7699	0.0929		4.6740	4.6740		4.6740	4.6740	681.3070	18.8804	700.1875	3.2031	0.0000	780.2644
Unmitigated	10.7894	0.5822	38.7699	0.0929		4.6740	4.6740		4.6740	4.6740	681.3070	18.8804	700.1875	3.2031	0.0000	780.2644

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.0685					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.2903					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	3.1157	0.4616	28.2955	0.0923		4.6159	4.6159		4.6159	4.6159	681.3070	0.0000	681.3070	3.1850	0.0000	760.9313
Landscaping	0.3149	0.1206	10.4744	5.5000e-004		0.0581	0.0581		0.0581	0.0581		18.8804	18.8804	0.0181		19.3330
Total	**10.7894**	**0.5822**	**38.7699**	**0.0929**		**4.6740**	**4.6740**		**4.6740**	**4.6740**	**681.3070**	**18.8804**	**700.1875**	**3.2031**	**0.0000**	**780.2644**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.0685					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.2903					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	3.1157	0.4616	28.2955	0.0923		4.6159	4.6159		4.6159	4.6159	681.3070	0.0000	681.3070	3.1850	0.0000	760.9313
Landscaping	0.3149	0.1206	10.4744	5.5000e-004		0.0581	0.0581		0.0581	0.0581		18.8804	18.8804	0.0181		19.3330
Total	**10.7894**	**0.5822**	**38.7699**	**0.0929**		**4.6740**	**4.6740**		**4.6740**	**4.6740**	**681.3070**	**18.8804**	**700.1875**	**3.2031**	**0.0000**	**780.2644**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch - Existing Land Use Designation Alternative

Bay Area AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	127.00	Dwelling Unit	63.70	228,600.00	363
Regional Shopping Center	65.34	1000sqft	3.00	65,340.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site dimensions.

Construction Phase - Grading phase timing adjusted to accomodate soil import.

Grading - Material export updated per site-specific information.

Vehicle Trips - Operational emissions not modeled.

Woodstoves - Operational emissions not modeled.

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	75.00	1,110.00
tblConstructionPhase	NumDays	110.00	120.00
tblFireplaces	NumberGas	31.75	0.00
tblFireplaces	NumberWood	54.61	0.00
tblGrading	MaterialImported	0.00	300,000.00
tblLandUse	LotAcreage	41.23	63.70
tblLandUse	LotAcreage	1.50	3.00
tblVehicleTrips	ST_TR	46.12	0.00
tblVehicleTrips	ST_TR	9.54	0.00
tblVehicleTrips	SU_TR	21.10	0.00
tblVehicleTrips	SU_TR	8.55	0.00
tblVehicleTrips	WD_TR	37.75	0.00
tblVehicleTrips	WD_TR	9.44	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.8959	75.6302	38.2520	0.2489	19.8049	1.6822	21.0349	10.1417	1.5604	11.2733	0.0000	26,391.0696	26,391.0696	2.6226	3.2131	27,414.1295
2025	5.2716	14.8242	19.8309	0.0396	0.8197	0.5883	1.4081	0.2211	0.5565	0.7777	0.0000	3,859.0685	3,859.0685	0.7163	0.0886	3,901.5002
2026	5.2608	14.8069	19.7399	0.0394	0.8197	0.5882	1.4079	0.2211	0.5564	0.7775	0.0000	3,838.0998	3,838.0998	0.6394	0.0865	3,879.8513
2027	5.2509	14.7901	19.6625	0.0391	0.8197	0.5880	1.4077	0.2211	0.5562	0.7773	0.0000	3,817.4789	3,817.4789	0.6382	0.0843	3,858.5628
2028	5.2417	14.7763	19.5979	0.0389	0.8198	0.5877	1.4075	0.2211	0.5560	0.7771	0.0000	3,798.3940	3,798.3940	0.6373	0.0823	3,838.8568
2029	5.2327	14.7578	19.5405	0.0387	0.8198	0.5875	1.4073	0.2211	0.5557	0.7769	0.0000	3,778.9542	3,778.9542	0.6364	0.0802	3,818.7592
Maximum	**5.2716**	**75.6302**	**38.2520**	**0.2489**	**19.8049**	**1.6822**	**21.0349**	**10.1417**	**1.5604**	**11.2733**	**0.0000**	**26,391.0696**	**26,391.0696**	**2.6226**	**3.2131**	**27,414.1295**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.8959	75.6302	38.2520	0.2489	19.8049	1.6822	21.0349	10.1417	1.5604	11.2733	0.0000	26,391.0696	26,391.0696	2.6226	3.2131	27,414.1295
2025	5.2716	14.8242	19.8309	0.0396	0.8197	0.5883	1.4081	0.2211	0.5565	0.7777	0.0000	3,859.0685	3,859.0685	0.7163	0.0886	3,901.5002
2026	5.2608	14.8069	19.7399	0.0394	0.8197	0.5882	1.4079	0.2211	0.5564	0.7775	0.0000	3,838.0998	3,838.0998	0.6394	0.0865	3,879.8513
2027	5.2509	14.7901	19.6625	0.0391	0.8197	0.5880	1.4077	0.2211	0.5562	0.7773	0.0000	3,817.4789	3,817.4789	0.6382	0.0843	3,858.5628
2028	5.2417	14.7763	19.5979	0.0389	0.8198	0.5877	1.4075	0.2211	0.5560	0.7771	0.0000	3,798.3940	3,798.3940	0.6373	0.0823	3,838.8568
2029	5.2327	14.7578	19.5405	0.0387	0.8198	0.5875	1.4073	0.2211	0.5557	0.7769	0.0000	3,778.9542	3,778.9542	0.6364	0.0802	3,818.7592
Maximum	**5.2716**	**75.6302**	**38.2520**	**0.2489**	**19.8049**	**1.6822**	**21.0349**	**10.1417**	**1.5604**	**11.2733**	**0.0000**	**26,391.0696**	**26,391.0696**	**2.6226**	**3.2131**	**27,414.1295**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	10.7894	0.5822	38.7699	0.0929		4.6740	4.6740		4.6740	4.6740	681.3070	18.8804	700.1875	3.2031	0.0000	780.2644
Energy	0.1044	0.8950	0.3979	5.7000e-003		0.0722	0.0722		0.0722	0.0722		1,139.3545	1,139.3545	0.0218	0.0209	1,146.1251
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**10.8938**	**1.4772**	**39.1677**	**0.0986**	**0.0000**	**4.7462**	**4.7462**	**0.0000**	**4.7462**	**4.7462**	**681.3070**	**1,158.2349**	**1,839.5419**	**3.2249**	**0.0209**	**1,926.3894**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	10.7894	0.5822	38.7699	0.0929		4.6740	4.6740		4.6740	4.6740	681.3070	18.8804	700.1875	3.2031	0.0000	780.2644
Energy	0.1044	0.8950	0.3979	5.7000e-003		0.0722	0.0722		0.0722	0.0722		1,139.3545	1,139.3545	0.0218	0.0209	1,146.1251
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**10.8938**	**1.4772**	**39.1677**	**0.0986**	**0.0000**	**4.7462**	**4.7462**	**0.0000**	**4.7462**	**4.7462**	**681.3070**	**1,158.2349**	**1,839.5419**	**3.2249**	**0.0209**	**1,926.3894**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/24/2024	5	40	
2	Grading	Grading	5/25/2024	11/8/2024	5	120	
3	Paving	Paving	11/9/2024	2/21/2025	5	75	
4	Building Construction	Building Construction	2/22/2025	5/25/2029	5	1110	
5	Architectural Coating	Architectural Coating	3/8/2025	6/8/2029	5	1110	

Acres of Grading (Site Preparation Phase): 60

Acres of Grading (Grading Phase): 360

Acres of Paving: 0

Residential Indoor: 462,915; Residential Outdoor: 154,305; Non-Residential Indoor: 98,010; Non-Residential Outdoor: 32,670; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	67.00	24.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310		3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**		**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0468	0.0308	0.3855	1.1500e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		118.8877	118.8877	3.4100e-003	3.3400e-003	119.9678
Total	**0.0468**	**0.0308**	**0.3855**	**1.1500e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**118.8877**	**118.8877**	**3.4100e-003**	**3.3400e-003**	**119.9678**

3.2 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310	0.0000	3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**	**0.0000**	**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0468	0.0308	0.3855	1.1500e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		118.8877	118.8877	3.4100e-003	3.3400e-003	119.9678
Total	**0.0468**	**0.0308**	**0.3855**	**1.1500e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**118.8877**	**118.8877**	**3.4100e-003**	**3.3400e-003**	**119.9678**

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286		6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**		**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6257	43.2190	10.1009	0.1856	5.4661	0.3461	5.8122	1.4983	0.3311	1.8294		20,249.2235	20,249.2235	0.6751	3.2094	21,222.4915
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0520	0.0342	0.4283	1.2800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		132.0975	132.0975	3.7900e-003	3.7100e-003	133.2975
Total	**0.6778**	**43.2532**	**10.5291**	**0.1869**	**5.6304**	**0.3468**	**5.9773**	**1.5419**	**0.3318**	**1.8737**		**20,381.3210**	**20,381.3210**	**0.6789**	**3.2131**	**21,355.7890**

3.3 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286	0.0000	6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**	**0.0000**	**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6257	43.2190	10.1009	0.1856	5.4661	0.3461	5.8122	1.4983	0.3311	1.8294		20,249.2235	20,249.2235	0.6751	3.2094	21,222.4915
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0520	0.0342	0.4283	1.2800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		132.0975	132.0975	3.7900e-003	3.7100e-003	133.2975
Total	**0.6778**	**43.2532**	**10.5291**	**0.1869**	**5.6304**	**0.3468**	**5.9773**	**1.5419**	**0.3318**	**1.8737**		**20,381.3210**	**20,381.3210**	**0.6789**	**3.2131**	**21,355.7890**

3.4 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0390	0.0257	0.3212	9.6000e-004	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		99.0731	99.0731	2.8400e-003	2.7800e-003	99.9731
Total	**0.0390**	**0.0257**	**0.3212**	**9.6000e-004**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**99.0731**	**99.0731**	**2.8400e-003**	**2.7800e-003**	**99.9731**

3.4 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0390	0.0257	0.3212	9.6000e-004	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		99.0731	99.0731	2.8400e-003	2.7800e-003	99.9731
Total	**0.0390**	**0.0257**	**0.3212**	**9.6000e-004**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**99.0731**	**99.0731**	**2.8400e-003**	**2.7800e-003**	**99.9731**

3.4 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0368	0.0231	0.3019	9.3000e-004	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		96.7068	96.7068	2.5900e-003	2.6100e-003	97.5484
Total	**0.0368**	**0.0231**	**0.3019**	**9.3000e-004**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**96.7068**	**96.7068**	**2.5900e-003**	**2.6100e-003**	**97.5484**

3.4 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850	0.0000	2,206.745 2	2,206.745 2	0.7137		2,224.587 8
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9152**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**	**0.0000**	**2,206.745 2**	**2,206.745 2**	**0.7137**		**2,224.587 8**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0368	0.0231	0.3019	9.3000e-004	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		96.7068	96.7068	2.5900e-003	2.6100e-003	97.5484
Total	**0.0368**	**0.0231**	**0.3019**	**9.3000e-004**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**96.7068**	**96.7068**	**2.5900e-003**	**2.6100e-003**	**97.5484**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0238	1.0857	0.3271	4.7100e-003	0.1626	6.3100e-003	0.1689	0.0468	6.0300e-003	0.0528		505.3764	505.3764	0.0105	0.0747	527.9123
Worker	0.1643	0.1033	1.3484	4.1500e-003	0.5504	2.4900e-003	0.5529	0.1460	2.2900e-003	0.1483		431.9572	431.9572	0.0116	0.0116	435.7160
Total	**0.1881**	**1.1890**	**1.6755**	**8.8600e-003**	**0.7130**	**8.8000e-003**	**0.7217**	**0.1928**	**8.3200e-003**	**0.2011**		**937.3336**	**937.3336**	**0.0221**	**0.0864**	**963.6283**

3.5 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0238	1.0857	0.3271	4.7100e-003	0.1626	6.3100e-003	0.1689	0.0468	6.0300e-003	0.0528		505.3764	505.3764	0.0105	0.0747	527.9123
Worker	0.1643	0.1033	1.3484	4.1500e-003	0.5504	2.4900e-003	0.5529	0.1460	2.2900e-003	0.1483		431.9572	431.9572	0.0116	0.0116	435.7160
Total	**0.1881**	**1.1890**	**1.6755**	**8.8600e-003**	**0.7130**	**8.8000e-003**	**0.7217**	**0.1928**	**8.3200e-003**	**0.2011**		**937.3336**	**937.3336**	**0.0221**	**0.0864**	**963.6283**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0232	1.0794	0.3224	4.6200e-003	0.1626	6.2700e-003	0.1688	0.0468	6.0000e-003	0.0528		496.1258	496.1258	0.0104	0.0733	518.2391
Worker	0.1557	0.0940	1.2761	4.0200e-003	0.5504	2.3700e-003	0.5528	0.1460	2.1800e-003	0.1482		422.1432	422.1432	0.0106	0.0110	425.6865
Total	**0.1790**	**1.1734**	**1.5985**	**8.6400e-003**	**0.7130**	**8.6400e-003**	**0.7216**	**0.1928**	**8.1800e-003**	**0.2010**		**918.2690**	**918.2690**	**0.0210**	**0.0843**	**943.9255**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0232	1.0794	0.3224	4.6200e-003	0.1626	6.2700e-003	0.1688	0.0468	6.0000e-003	0.0528		496.1258	496.1258	0.0104	0.0733	518.2391
Worker	0.1557	0.0940	1.2761	4.0200e-003	0.5504	2.3700e-003	0.5528	0.1460	2.1800e-003	0.1482		422.1432	422.1432	0.0106	0.0110	425.6865
Total	**0.1790**	**1.1734**	**1.5985**	**8.6400e-003**	**0.7130**	**8.6400e-003**	**0.7216**	**0.1928**	**8.1800e-003**	**0.2010**		**918.2690**	**918.2690**	**0.0210**	**0.0843**	**943.9255**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0228	1.0718	0.3184	4.5300e-003	0.1626	6.2200e-003	0.1688	0.0468	5.9500e-003	0.0528		486.1329	486.1329	0.0104	0.0718	507.7942
Worker	0.1479	0.0863	1.2147	3.9000e-003	0.5504	2.2400e-003	0.5526	0.1460	2.0600e-003	0.1481		413.2423	413.2423	9.7100e-003	0.0105	416.6049
Total	**0.1706**	**1.1581**	**1.5331**	**8.4300e-003**	**0.7130**	**8.4600e-003**	**0.7214**	**0.1928**	**8.0100e-003**	**0.2008**		**899.3752**	**899.3752**	**0.0201**	**0.0823**	**924.3990**

3.5 Building Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0228	1.0718	0.3184	4.5300e-003	0.1626	6.2200e-003	0.1688	0.0468	5.9500e-003	0.0528		486.1329	486.1329	0.0104	0.0718	507.7942
Worker	0.1479	0.0863	1.2147	3.9000e-003	0.5504	2.2400e-003	0.5526	0.1460	2.0600e-003	0.1481		413.2423	413.2423	9.7100e-003	0.0105	416.6049
Total	**0.1706**	**1.1581**	**1.5331**	**8.4300e-003**	**0.7130**	**8.4600e-003**	**0.7214**	**0.1928**	**8.0100e-003**	**0.2008**		**899.3752**	**899.3752**	**0.0201**	**0.0823**	**924.3990**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0224	1.0658	0.3154	4.4400e-003	0.1626	6.1700e-003	0.1687	0.0468	5.9100e-003	0.0527		476.4822	476.4822	0.0103	0.0704	497.7032
Worker	0.1405	0.0799	1.1630	3.8000e-003	0.5504	2.0900e-003	0.5525	0.1460	1.9300e-003	0.1479		405.3411	405.3411	8.9700e-003	0.0100	408.5523
Total	**0.1628**	**1.1457**	**1.4784**	**8.2400e-003**	**0.7130**	**8.2600e-003**	**0.7212**	**0.1928**	**7.8400e-003**	**0.2006**		**881.8233**	**881.8233**	**0.0193**	**0.0804**	**906.2555**

3.5 Building Construction - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0224	1.0658	0.3154	4.4400e-003	0.1626	6.1700e-003	0.1687	0.0468	5.9100e-003	0.0527		476.4822	476.4822	0.0103	0.0704	497.7032
Worker	0.1405	0.0799	1.1630	3.8000e-003	0.5504	2.0900e-003	0.5525	0.1460	1.9300e-003	0.1479		405.3411	405.3411	8.9700e-003	0.0100	408.5523
Total	**0.1628**	**1.1457**	**1.4784**	**8.2400e-003**	**0.7130**	**8.2600e-003**	**0.7212**	**0.1928**	**7.8400e-003**	**0.2006**		**881.8233**	**881.8233**	**0.0193**	**0.0804**	**906.2555**

3.5 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0220	1.0539	0.3120	4.3300e-003	0.1626	6.0900e-003	0.1687	0.0468	5.8300e-003	0.0526		465.4746	465.4746	0.0102	0.0687	486.1913
Worker	0.1333	0.0744	1.1178	3.7100e-003	0.5504	1.9600e-003	0.5524	0.1460	1.8100e-003	0.1478		398.2792	398.2792	8.3100e-003	9.6500e-003	401.3618
Total	**0.1552**	**1.1282**	**1.4298**	**8.0400e-003**	**0.7130**	**8.0500e-003**	**0.7210**	**0.1928**	**7.6400e-003**	**0.2004**		**863.7537**	**863.7537**	**0.0185**	**0.0783**	**887.5531**

3.5 Building Construction - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0220	1.0539	0.3120	4.3300e-003	0.1626	6.0900e-003	0.1687	0.0468	5.8300e-003	0.0526		465.4746	465.4746	0.0102	0.0687	486.1913
Worker	0.1333	0.0744	1.1178	3.7100e-003	0.5504	1.9600e-003	0.5524	0.1460	1.8100e-003	0.1478		398.2792	398.2792	8.3100e-003	9.6500e-003	401.3618
Total	**0.1552**	**1.1282**	**1.4298**	**8.0400e-003**	**0.7130**	**8.0500e-003**	**0.7210**	**0.1928**	**7.6400e-003**	**0.2004**		**863.7537**	**863.7537**	**0.0185**	**0.0783**	**887.5531**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0319	0.0200	0.2616	8.0000e-004	0.1068	4.8000e-004	0.1073	0.0283	4.4000e-004	0.0288		83.8126	83.8126	2.2400e-003	2.2600e-003	84.5419
Total	**0.0319**	**0.0200**	**0.2616**	**8.0000e-004**	**0.1068**	**4.8000e-004**	**0.1073**	**0.0283**	**4.4000e-004**	**0.0288**		**83.8126**	**83.8126**	**2.2400e-003**	**2.2600e-003**	**84.5419**

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0319	0.0200	0.2616	8.0000e-004	0.1068	4.8000e-004	0.1073	0.0283	4.4000e-004	0.0288		83.8126	83.8126	2.2400e-003	2.2600e-003	84.5419
Total	**0.0319**	**0.0200**	**0.2616**	**8.0000e-004**	**0.1068**	**4.8000e-004**	**0.1073**	**0.0283**	**4.4000e-004**	**0.0288**		**83.8126**	**83.8126**	**2.2400e-003**	**2.2600e-003**	**84.5419**

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0302	0.0183	0.2476	7.8000e-004	0.1068	4.6000e-004	0.1073	0.0283	4.2000e-004	0.0288		81.9084	81.9084	2.0500e-003	2.1400e-003	82.5959
Total	**0.0302**	**0.0183**	**0.2476**	**7.8000e-004**	**0.1068**	**4.6000e-004**	**0.1073**	**0.0283**	**4.2000e-004**	**0.0288**		**81.9084**	**81.9084**	**2.0500e-003**	**2.1400e-003**	**82.5959**

3.6 Architectural Coating - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0302	0.0183	0.2476	7.8000e-004	0.1068	4.6000e-004	0.1073	0.0283	4.2000e-004	0.0288		81.9084	81.9084	2.0500e-003	2.1400e-003	82.5959
Total	**0.0302**	**0.0183**	**0.2476**	**7.8000e-004**	**0.1068**	**4.6000e-004**	**0.1073**	**0.0283**	**4.2000e-004**	**0.0288**		**81.9084**	**81.9084**	**2.0500e-003**	**2.1400e-003**	**82.5959**

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0287	0.0168	0.2357	7.6000e-004	0.1068	4.3000e-004	0.1072	0.0283	4.0000e-004	0.0287		80.1813	80.1813	1.8800e-003	2.0300e-003	80.8338
Total	**0.0287**	**0.0168**	**0.2357**	**7.6000e-004**	**0.1068**	**4.3000e-004**	**0.1072**	**0.0283**	**4.0000e-004**	**0.0287**		**80.1813**	**80.1813**	**1.8800e-003**	**2.0300e-003**	**80.8338**

3.6 Architectural Coating - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0287	0.0168	0.2357	7.6000e-004	0.1068	4.3000e-004	0.1072	0.0283	4.0000e-004	0.0287		80.1813	80.1813	1.8800e-003	2.0300e-003	80.8338
Total	**0.0287**	**0.0168**	**0.2357**	**7.6000e-004**	**0.1068**	**4.3000e-004**	**0.1072**	**0.0283**	**4.0000e-004**	**0.0287**		**80.1813**	**80.1813**	**1.8800e-003**	**2.0300e-003**	**80.8338**

3.6 Architectural Coating - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0273	0.0155	0.2257	7.4000e-004	0.1068	4.1000e-004	0.1072	0.0283	3.7000e-004	0.0287		78.6483	78.6483	1.7400e-003	1.9400e-003	79.2714
Total	**0.0273**	**0.0155**	**0.2257**	**7.4000e-004**	**0.1068**	**4.1000e-004**	**0.1072**	**0.0283**	**3.7000e-004**	**0.0287**		**78.6483**	**78.6483**	**1.7400e-003**	**1.9400e-003**	**79.2714**

3.6 Architectural Coating - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0273	0.0155	0.2257	7.4000e-004	0.1068	4.1000e-004	0.1072	0.0283	3.7000e-004	0.0287		78.6483	78.6483	1.7400e-003	1.9400e-003	79.2714
Total	**0.0273**	**0.0155**	**0.2257**	**7.4000e-004**	**0.1068**	**4.1000e-004**	**0.1072**	**0.0283**	**3.7000e-004**	**0.0287**		**78.6483**	**78.6483**	**1.7400e-003**	**1.9400e-003**	**79.2714**

3.6 Architectural Coating - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0259	0.0144	0.2169	7.2000e-004	0.1068	3.8000e-004	0.1072	0.0283	3.5000e-004	0.0287		77.2781	77.2781	1.6100e-003	1.8700e-003	77.8762
Total	**0.0259**	**0.0144**	**0.2169**	**7.2000e-004**	**0.1068**	**3.8000e-004**	**0.1072**	**0.0283**	**3.5000e-004**	**0.0287**		**77.2781**	**77.2781**	**1.6100e-003**	**1.8700e-003**	**77.8762**

3.6 Architectural Coating - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.5134					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**3.6842**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0259	0.0144	0.2169	7.2000e-004	0.1068	3.8000e-004	0.1072	0.0283	3.5000e-004	0.0287		77.2781	77.2781	1.6100e-003	1.8700e-003	77.8762
Total	**0.0259**	**0.0144**	**0.2169**	**7.2000e-004**	**0.1068**	**3.8000e-004**	**0.1072**	**0.0283**	**3.5000e-004**	**0.0287**		**77.2781**	**77.2781**	**1.6100e-003**	**1.8700e-003**	**77.8762**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Regional Shopping Center	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1044	0.8950	0.3979	5.7000e-003		0.0722	0.0722		0.0722	0.0722		1,139.3545	1,139.3545	0.0218	0.0209	1,146.1251
NaturalGas Unmitigated	0.1044	0.8950	0.3979	5.7000e-003		0.0722	0.0722		0.0722	0.0722		1,139.3545	1,139.3545	0.0218	0.0209	1,146.1251

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Regional Shopping Center	418.892	4.5200e-003	0.0411	0.0345	2.5000e-004		3.1200e-003	3.1200e-003		3.1200e-003	3.1200e-003		49.2814	49.2814	9.4000e-004	9.0000e-004	49.5743
Single Family Housing	9265.62	0.0999	0.8539	0.3634	5.4500e-003		0.0690	0.0690		0.0690	0.0690		1,090.0730	1,090.0730	0.0209	0.0200	1,096.5508
Total		**0.1044**	**0.8950**	**0.3979**	**5.7000e-003**		**0.0722**	**0.0722**		**0.0722**	**0.0722**		**1,139.3545**	**1,139.3545**	**0.0218**	**0.0209**	**1,146.1251**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Regional Shopping Center	0.418892	4.5200e-003	0.0411	0.0345	2.5000e-004		3.1200e-003	3.1200e-003		3.1200e-003	3.1200e-003		49.2814	49.2814	9.4000e-004	9.0000e-004	49.5743
Single Family Housing	9.26562	0.0999	0.8539	0.3634	5.4500e-003		0.0690	0.0690		0.0690	0.0690		1,090.0730	1,090.0730	0.0209	0.0200	1,096.5508
Total		**0.1044**	**0.8950**	**0.3979**	**5.7000e-003**		**0.0722**	**0.0722**		**0.0722**	**0.0722**		**1,139.3545**	**1,139.3545**	**0.0218**	**0.0209**	**1,146.1251**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	10.7894	0.5822	38.7699	0.0929		4.6740	4.6740		4.6740	4.6740	681.3070	18.8804	700.1875	3.2031	0.0000	780.2644
Unmitigated	10.7894	0.5822	38.7699	0.0929		4.6740	4.6740		4.6740	4.6740	681.3070	18.8804	700.1875	3.2031	0.0000	780.2644

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.0685					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.2903					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	3.1157	0.4616	28.2955	0.0923		4.6159	4.6159		4.6159	4.6159	681.3070	0.0000	681.3070	3.1850	0.0000	760.9313
Landscaping	0.3149	0.1206	10.4744	5.5000e-004		0.0581	0.0581		0.0581	0.0581		18.8804	18.8804	0.0181		19.3330
Total	**10.7894**	**0.5822**	**38.7699**	**0.0929**		**4.6740**	**4.6740**		**4.6740**	**4.6740**	**681.3070**	**18.8804**	**700.1875**	**3.2031**	**0.0000**	**780.2644**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.0685					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.2903					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	3.1157	0.4616	28.2955	0.0923		4.6159	4.6159		4.6159	4.6159	681.3070	0.0000	681.3070	3.1850	0.0000	760.9313
Landscaping	0.3149	0.1206	10.4744	5.5000e-004		0.0581	0.0581		0.0581	0.0581		18.8804	18.8804	0.0181		19.3330
Total	**10.7894**	**0.5822**	**38.7699**	**0.0929**		**4.6740**	**4.6740**		**4.6740**	**4.6740**	**681.3070**	**18.8804**	**700.1875**	**3.2031**	**0.0000**	**780.2644**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch - Reduced Density Alternative

Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	13.20	Acre	13.20	574,992.00	0
Congregate Care (Assisted Living)	150.00	Dwelling Unit	1.50	150,000.00	429
Single Family Housing	147.00	Dwelling Unit	31.20	264,600.00	420
Regional Shopping Center	40.00	1000sqft	1.50	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site plan.

Construction Phase - Grading phase timing adjusted to account for soil import.

Grading - Material import updated per site-specific information.

Vehicle Trips - Operational emissions not modeled.

Woodstoves - Operational emissions not modeled.

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	55.00	740.00
tblConstructionPhase	NumDays	75.00	120.00
tblConstructionPhase	PhaseEndDate	6/25/2027	11/12/2027
tblConstructionPhase	PhaseEndDate	8/23/2024	10/25/2024
tblConstructionPhase	PhaseEndDate	9/10/2027	1/10/2025
tblConstructionPhase	PhaseStartDate	9/11/2027	1/25/2025
tblConstructionPhase	PhaseStartDate	8/24/2024	1/11/2025
tblConstructionPhase	PhaseStartDate	6/26/2027	10/26/2024
tblFireplaces	NumberGas	22.50	0.00
tblFireplaces	NumberGas	36.75	0.00
tblFireplaces	NumberWood	25.50	0.00
tblFireplaces	NumberWood	63.21	0.00
tblGrading	MaterialImported	0.00	300,000.00
tblLandUse	LotAcreage	9.38	1.50
tblLandUse	LotAcreage	47.73	31.20
tblLandUse	LotAcreage	0.92	1.50
tblVehicleTrips	ST_TR	2.93	0.00
tblVehicleTrips	ST_TR	46.12	0.00
tblVehicleTrips	ST_TR	9.54	0.00
tblVehicleTrips	SU_TR	3.15	0.00
tblVehicleTrips	SU_TR	21.10	0.00
tblVehicleTrips	SU_TR	8.55	0.00
tblVehicleTrips	WD_TR	2.60	0.00
tblVehicleTrips	WD_TR	37.75	0.00
tblVehicleTrips	WD_TR	9.44	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.3143	5.1212	2.9213	0.0161	1.1955	0.1304	1.3259	0.4644	0.1207	0.5851	0.0000	1,536.9502	1,536.9502	0.1744	0.1749	1,593.4228
2025	1.4243	2.5848	3.7565	0.0111	0.6054	0.0814	0.6868	0.1636	0.0769	0.2406	0.0000	1,022.8589	1,022.8589	0.0891	0.0568	1,042.0054
2026	1.5016	2.6248	3.7597	0.0112	0.6274	0.0824	0.7098	0.1696	0.0779	0.2475	0.0000	1,035.6419	1,035.6419	0.0886	0.0572	1,054.8910
2027	1.3392	2.2684	3.2189	9.5600e-003	0.5466	0.0715	0.6180	0.1477	0.0676	0.2153	0.0000	887.8669	887.8669	0.0761	0.0483	904.1684
Maximum	**1.5016**	**5.1212**	**3.7597**	**0.0161**	**1.1955**	**0.1304**	**1.3259**	**0.4644**	**0.1207**	**0.5851**	**0.0000**	**1,536.9502**	**1,536.9502**	**0.1744**	**0.1749**	**1,593.4228**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.3143	5.1212	2.9213	0.0161	1.1955	0.1304	1.3259	0.4644	0.1207	0.5851	0.0000	1,536.9497	1,536.9497	0.1744	0.1749	1,593.4223
2025	1.4243	2.5848	3.7565	0.0111	0.6054	0.0814	0.6868	0.1636	0.0769	0.2406	0.0000	1,022.8585	1,022.8585	0.0891	0.0568	1,042.0050
2026	1.5016	2.6248	3.7597	0.0112	0.6274	0.0824	0.7098	0.1696	0.0779	0.2475	0.0000	1,035.6415	1,035.6415	0.0886	0.0572	1,054.8906
2027	1.3392	2.2684	3.2189	9.5600e-003	0.5466	0.0715	0.6180	0.1477	0.0676	0.2153	0.0000	887.8665	887.8665	0.0761	0.0483	904.1680
Maximum	**1.5016**	**5.1212**	**3.7597**	**0.0161**	**1.1955**	**0.1304**	**1.3259**	**0.4644**	**0.1207**	**0.5851**	**0.0000**	**1,536.9497**	**1,536.9497**	**0.1744**	**0.1749**	**1,593.4223**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**4-1-2024**	**6-30-2024**	1.8334	1.8334
2	**7-1-2024**	**9-30-2024**	2.5366	2.5366
3	**10-1-2024**	**12-31-2024**	0.9782	0.9782
4	**1-1-2025**	**3-31-2025**	0.9004	0.9004
5	**4-1-2025**	**6-30-2025**	1.0256	1.0256
6	**7-1-2025**	**9-30-2025**	1.0369	1.0369
7	**10-1-2025**	**12-31-2025**	1.0536	1.0536
8	**1-1-2026**	**3-31-2026**	1.0252	1.0252

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

9	**4-1-2026**	**6-30-2026**	1.0205	1.0205
10	**7-1-2026**	**9-30-2026**	1.0317	1.0317
11	**10-1-2026**	**12-31-2026**	1.0480	1.0480
12	**1-1-2027**	**3-31-2027**	1.0201	1.0201
13	**4-1-2027**	**6-30-2027**	1.0156	1.0156
14	**7-1-2027**	**9-30-2027**	1.0268	1.0268
		Highest	2.5366	2.5366

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.2533	0.0328	2.6556	1.5900e-003		0.0860	0.0860		0.0860	0.0860	9.8727	3.6032	13.4759	0.0496	0.0000	14.7161
Energy	0.0284	0.2429	0.1053	1.5500e-003		0.0196	0.0196		0.0196	0.0196	0.0000	479.6345	479.6345	0.0375	9.0500e-003	483.2685
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	72.1186	0.0000	72.1186	4.2621	0.0000	178.6709
Water						0.0000	0.0000		0.0000	0.0000	7.0791	15.7099	22.7890	0.7296	0.0175	46.2377
Total	**2.2817**	**0.2757**	**2.7609**	**3.1400e-003**	**0.0000**	**0.1056**	**0.1056**	**0.0000**	**0.1056**	**0.1056**	**89.0705**	**498.9475**	**588.0180**	**5.0789**	**0.0265**	**722.8931**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.2533	0.0328	2.6556	1.5900e-003		0.0860	0.0860		0.0860	0.0860	9.8727	3.6032	13.4759	0.0496	0.0000	14.7161
Energy	0.0284	0.2429	0.1053	1.5500e-003		0.0196	0.0196		0.0196	0.0196	0.0000	479.6345	479.6345	0.0375	9.0500e-003	483.2685
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	72.1186	0.0000	72.1186	4.2621	0.0000	178.6709
Water						0.0000	0.0000		0.0000	0.0000	7.0791	15.7099	22.7890	0.7296	0.0175	46.2377
Total	**2.2817**	**0.2757**	**2.7609**	**3.1400e-003**	**0.0000**	**0.1056**	**0.1056**	**0.0000**	**0.1056**	**0.1056**	**89.0705**	**498.9475**	**588.0180**	**5.0789**	**0.0265**	**722.8931**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/10/2024	5	30	
2	Grading	Grading	5/11/2024	10/25/2024	5	120	
3	Building Construction	Building Construction	1/11/2025	11/12/2027	5	740	

4	Paving	Paving	10/26/2024	1/10/2025	5	55	
5	Architectural Coating	Architectural Coating	1/25/2025	11/26/2027	5	740	

Acres of Grading (Site Preparation Phase): 45

Acres of Grading (Grading Phase): 360

Acres of Paving: 13.2

Residential Indoor: 839,565; Residential Outdoor: 279,855; Non-Residential Indoor: 60,000; Non-Residential Outdoor: 20,000; Striped Parking Area: 34,500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	415.00	133.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	83.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2949	0.0000	0.2949	0.1515	0.0000	0.1515	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0399	0.4076	0.2750	5.7000e-004		0.0184	0.0184		0.0170	0.0170	0.0000	50.1856	50.1856	0.0162	0.0000	50.5914
Total	**0.0399**	**0.4076**	**0.2750**	**5.7000e-004**	**0.2949**	**0.0184**	**0.3133**	**0.1515**	**0.0170**	**0.1685**	**0.0000**	**50.1856**	**50.1856**	**0.0162**	**0.0000**	**50.5914**

3.2 Site Preparation - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	4.2000e-004	5.5900e-003	2.0000e-005	2.1300e-003	1.0000e-005	2.1400e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.6309	1.6309	4.0000e-005	4.0000e-005	1.6447
Total	**6.5000e-004**	**4.2000e-004**	**5.5900e-003**	**2.0000e-005**	**2.1300e-003**	**1.0000e-005**	**2.1400e-003**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**1.6309**	**1.6309**	**4.0000e-005**	**4.0000e-005**	**1.6447**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2949	0.0000	0.2949	0.1515	0.0000	0.1515	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0399	0.4076	0.2750	5.7000e-004		0.0184	0.0184		0.0170	0.0170	0.0000	50.1855	50.1855	0.0162	0.0000	50.5913
Total	**0.0399**	**0.4076**	**0.2750**	**5.7000e-004**	**0.2949**	**0.0184**	**0.3133**	**0.1515**	**0.0170**	**0.1685**	**0.0000**	**50.1855**	**50.1855**	**0.0162**	**0.0000**	**50.5913**

3.2 Site Preparation - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	4.2000e-004	5.5900e-003	2.0000e-005	2.1300e-003	1.0000e-005	2.1400e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.6309	1.6309	4.0000e-005	4.0000e-005	1.6447
Total	**6.5000e-004**	**4.2000e-004**	**5.5900e-003**	**2.0000e-005**	**2.1300e-003**	**1.0000e-005**	**2.1400e-003**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**1.6309**	**1.6309**	**4.0000e-005**	**4.0000e-005**	**1.6447**

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5692	0.0000	0.5692	0.2218	0.0000	0.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1931	1.9426	1.6634	3.7200e-003		0.0801	0.0801		0.0737	0.0737	0.0000	327.1171	327.1171	0.1058	0.0000	329.7621
Total	**0.1931**	**1.9426**	**1.6634**	**3.7200e-003**	**0.5692**	**0.0801**	**0.6493**	**0.2218**	**0.0737**	**0.2955**	**0.0000**	**327.1171**	**327.1171**	**0.1058**	**0.0000**	**329.7621**

3.3 Grading - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0390	2.5443	0.6014	0.0111	0.3171	0.0207	0.3379	0.0872	0.0199	0.1071	0.0000	1,101.5768	1,101.5768	0.0368	0.1746	1,154.5248
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	1.8800e-003	0.0249	8.0000e-005	9.4800e-003	5.0000e-005	9.5300e-003	2.5200e-003	4.0000e-005	2.5700e-003	0.0000	7.2483	7.2483	1.9000e-004	1.9000e-004	7.3098
Total	**0.0418**	**2.5461**	**0.6263**	**0.0112**	**0.3266**	**0.0208**	**0.3474**	**0.0898**	**0.0199**	**0.1097**	**0.0000**	**1,108.8251**	**1,108.8251**	**0.0370**	**0.1748**	**1,161.8346**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5692	0.0000	0.5692	0.2218	0.0000	0.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1931	1.9426	1.6634	3.7200e-003		0.0801	0.0801		0.0737	0.0737	0.0000	327.1168	327.1168	0.1058	0.0000	329.7617
Total	**0.1931**	**1.9426**	**1.6634**	**3.7200e-003**	**0.5692**	**0.0801**	**0.6493**	**0.2218**	**0.0737**	**0.2955**	**0.0000**	**327.1168**	**327.1168**	**0.1058**	**0.0000**	**329.7617**

3.3 Grading - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0390	2.5443	0.6014	0.0111	0.3171	0.0207	0.3379	0.0872	0.0199	0.1071	0.0000	1,101.576 8	1,101.576 8	0.0368	0.1746	1,154.524 8
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	1.8800e-003	0.0249	8.0000e-005	9.4800e-003	5.0000e-005	9.5300e-003	2.5200e-003	4.0000e-005	2.5700e-003	0.0000	7.2483	7.2483	1.9000e-004	1.9000e-004	7.3098
Total	**0.0418**	**2.5461**	**0.6263**	**0.0112**	**0.3266**	**0.0208**	**0.3474**	**0.0898**	**0.0199**	**0.1097**	**0.0000**	**1,108.825 1**	**1,108.825 1**	**0.0370**	**0.1748**	**1,161.834 6**

3.4 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1730	1.5774	2.0347	3.4100e-003		0.0667	0.0667		0.0628	0.0628	0.0000	293.3781	293.3781	0.0690	0.0000	295.1022
Total	**0.1730**	**1.5774**	**2.0347**	**3.4100e-003**		**0.0667**	**0.0667**		**0.0628**	**0.0628**	**0.0000**	**293.3781**	**293.3781**	**0.0690**	**0.0000**	**295.1022**

3.4 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0170	0.7456	0.2251	3.3000e-003	0.1104	4.4100e-003	0.1148	0.0319	4.2200e-003	0.0362	0.0000	321.1185	321.1185	6.7000e-003	0.0475	335.4332
Worker	0.1183	0.0740	1.0213	3.2700e-003	0.4148	1.9500e-003	0.4168	0.1104	1.7900e-003	0.1122	0.0000	309.5214	309.5214	7.7000e-003	7.7900e-003	312.0361
Total	**0.1353**	**0.8195**	**1.2463**	**6.5700e-003**	**0.5252**	**6.3600e-003**	**0.5316**	**0.1423**	**6.0100e-003**	**0.1483**	**0.0000**	**630.6399**	**630.6399**	**0.0144**	**0.0553**	**647.4693**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1730	1.5774	2.0347	3.4100e-003		0.0667	0.0667		0.0628	0.0628	0.0000	293.3778	293.3778	0.0690	0.0000	295.1019
Total	**0.1730**	**1.5774**	**2.0347**	**3.4100e-003**		**0.0667**	**0.0667**		**0.0628**	**0.0628**	**0.0000**	**293.3778**	**293.3778**	**0.0690**	**0.0000**	**295.1019**

3.4 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0170	0.7456	0.2251	3.3000e-003	0.1104	4.4100e-003	0.1148	0.0319	4.2200e-003	0.0362	0.0000	321.1185	321.1185	6.7000e-003	0.0475	335.4332
Worker	0.1183	0.0740	1.0213	3.2700e-003	0.4148	1.9500e-003	0.4168	0.1104	1.7900e-003	0.1122	0.0000	309.5214	309.5214	7.7000e-003	7.7900e-003	312.0361
Total	**0.1353**	**0.8195**	**1.2463**	**6.5700e-003**	**0.5252**	**6.3600e-003**	**0.5316**	**0.1423**	**6.0100e-003**	**0.1483**	**0.0000**	**630.6399**	**630.6399**	**0.0144**	**0.0553**	**647.4693**

3.4 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.4 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0171	0.7647	0.2289	3.3400e-003	0.1139	4.5300e-003	0.1184	0.0329	4.3300e-003	0.0373	0.0000	325.2040	325.2040	6.8800e-003	0.0481	339.6944
Worker	0.1154	0.0695	0.9964	3.2700e-003	0.4279	1.9200e-003	0.4299	0.1139	1.7600e-003	0.1156	0.0000	312.0525	312.0525	7.2600e-003	7.6000e-003	314.4981
Total	**0.1325**	**0.8341**	**1.2252**	**6.6100e-003**	**0.5418**	**6.4500e-003**	**0.5483**	**0.1468**	**6.0900e-003**	**0.1529**	**0.0000**	**637.2565**	**637.2565**	**0.0141**	**0.0557**	**654.1925**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

3.4 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0171	0.7647	0.2289	3.3400e-003	0.1139	4.5300e-003	0.1184	0.0329	4.3300e-003	0.0373	0.0000	325.2040	325.2040	6.8800e-003	0.0481	339.6944
Worker	0.1154	0.0695	0.9964	3.2700e-003	0.4279	1.9200e-003	0.4299	0.1139	1.7600e-003	0.1156	0.0000	312.0525	312.0525	7.2600e-003	7.6000e-003	314.4981
Total	**0.1325**	**0.8341**	**1.2252**	**6.6100e-003**	**0.5418**	**6.4500e-003**	**0.5483**	**0.1468**	**6.0900e-003**	**0.1529**	**0.0000**	**637.2565**	**637.2565**	**0.0141**	**0.0557**	**654.1925**

3.4 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1545	1.4091	1.8176	3.0500e-003		0.0596	0.0596		0.0561	0.0561	0.0000	262.0690	262.0690	0.0616	0.0000	263.6091
Total	**0.1545**	**1.4091**	**1.8176**	**3.0500e-003**		**0.0596**	**0.0596**		**0.0561**	**0.0561**	**0.0000**	**262.0690**	**262.0690**	**0.0616**	**0.0000**	**263.6091**

3.4 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0145	0.6574	0.1957	2.8300e-003	0.0986	3.8900e-003	0.1025	0.0285	3.7200e-003	0.0323	0.0000	275.9184	275.9184	5.9000e-003	0.0408	288.2091
Worker	0.0947	0.0552	0.8207	2.7500e-003	0.3706	1.5700e-003	0.3721	0.0986	1.4400e-003	0.1000	0.0000	264.5086	264.5086	5.7800e-003	6.2600e-003	266.5184
Total	**0.1092**	**0.7127**	**1.0164**	**5.5800e-003**	**0.4692**	**5.4600e-003**	**0.4746**	**0.1271**	**5.1600e-003**	**0.1323**	**0.0000**	**540.4270**	**540.4270**	**0.0117**	**0.0470**	**554.7276**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1545	1.4091	1.8176	3.0500e-003		0.0596	0.0596		0.0561	0.0561	0.0000	262.0687	262.0687	0.0616	0.0000	263.6088
Total	**0.1545**	**1.4091**	**1.8176**	**3.0500e-003**		**0.0596**	**0.0596**		**0.0561**	**0.0561**	**0.0000**	**262.0687**	**262.0687**	**0.0616**	**0.0000**	**263.6088**

3.4 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0145	0.6574	0.1957	2.8300e-003	0.0986	3.8900e-003	0.1025	0.0285	3.7200e-003	0.0323	0.0000	275.9184	275.9184	5.9000e-003	0.0408	288.2091
Worker	0.0947	0.0552	0.8207	2.7500e-003	0.3706	1.5700e-003	0.3721	0.0986	1.4400e-003	0.1000	0.0000	264.5086	264.5086	5.7800e-003	6.2600e-003	266.5184
Total	**0.1092**	**0.7127**	**1.0164**	**5.5800e-003**	**0.4692**	**5.4600e-003**	**0.4746**	**0.1271**	**5.1600e-003**	**0.1323**	**0.0000**	**540.4270**	**540.4270**	**0.0117**	**0.0470**	**554.7276**

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0232	0.2238	0.3437	5.4000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	47.0624	47.0624	0.0152	0.0000	47.4429
Paving	0.0148					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0380**	**0.2238**	**0.3437**	**5.4000e-004**		**0.0110**	**0.0110**		**0.0101**	**0.0101**	**0.0000**	**47.0624**	**47.0624**	**0.0152**	**0.0000**	**47.4429**

3.5 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.4000e-004	5.5000e-004	7.3000e-003	2.0000e-005	2.7900e-003	1.0000e-005	2.8000e-003	7.4000e-004	1.0000e-005	7.5000e-004	0.0000	2.1292	2.1292	6.0000e-005	6.0000e-005	2.1472
Total	**8.4000e-004**	**5.5000e-004**	**7.3000e-003**	**2.0000e-005**	**2.7900e-003**	**1.0000e-005**	**2.8000e-003**	**7.4000e-004**	**1.0000e-005**	**7.5000e-004**	**0.0000**	**2.1292**	**2.1292**	**6.0000e-005**	**6.0000e-005**	**2.1472**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0232	0.2238	0.3437	5.4000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	47.0623	47.0623	0.0152	0.0000	47.4428
Paving	0.0148					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0380**	**0.2238**	**0.3437**	**5.4000e-004**		**0.0110**	**0.0110**		**0.0101**	**0.0101**	**0.0000**	**47.0623**	**47.0623**	**0.0152**	**0.0000**	**47.4428**

3.5 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.4000e-004	5.5000e-004	7.3000e-003	2.0000e-005	2.7900e-003	1.0000e-005	2.8000e-003	7.4000e-004	1.0000e-005	7.5000e-004	0.0000	2.1292	2.1292	6.0000e-005	6.0000e-005	2.1472
Total	**8.4000e-004**	**5.5000e-004**	**7.3000e-003**	**2.0000e-005**	**2.7900e-003**	**1.0000e-005**	**2.8000e-003**	**7.4000e-004**	**1.0000e-005**	**7.5000e-004**	**0.0000**	**2.1292**	**2.1292**	**6.0000e-005**	**6.0000e-005**	**2.1472**

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6600e-003	0.0343	0.0583	9.0000e-005		1.6700e-003	1.6700e-003		1.5400e-003	1.5400e-003	0.0000	8.0077	8.0077	2.5900e-003	0.0000	8.0725
Paving	2.5200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.1800e-003**	**0.0343**	**0.0583**	**9.0000e-005**		**1.6700e-003**	**1.6700e-003**		**1.5400e-003**	**1.5400e-003**	**0.0000**	**8.0077**	**8.0077**	**2.5900e-003**	**0.0000**	**8.0725**

3.5 Paving - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	8.0000e-005	1.1700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3538	0.3538	1.0000e-005	1.0000e-005	0.3566
Total	**1.4000e-004**	**8.0000e-005**	**1.1700e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.3538**	**0.3538**	**1.0000e-005**	**1.0000e-005**	**0.3566**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6600e-003	0.0343	0.0583	9.0000e-005		1.6700e-003	1.6700e-003		1.5400e-003	1.5400e-003	0.0000	8.0077	8.0077	2.5900e-003	0.0000	8.0724
Paving	2.5200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.1800e-003**	**0.0343**	**0.0583**	**9.0000e-005**		**1.6700e-003**	**1.6700e-003**		**1.5400e-003**	**1.5400e-003**	**0.0000**	**8.0077**	**8.0077**	**2.5900e-003**	**0.0000**	**8.0724**

3.5 Paving - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	8.0000e-005	1.1700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3538	0.3538	1.0000e-005	1.0000e-005	0.3566
Total	**1.4000e-004**	**8.0000e-005**	**1.1700e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.3538**	**0.3538**	**1.0000e-005**	**1.0000e-005**	**0.3566**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0663					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.1392	0.2198	3.6000e-004		6.2600e-003	6.2600e-003		6.2600e-003	6.2600e-003	0.0000	31.0220	31.0220	1.6900e-003	0.0000	31.0643
Total	**1.0870**	**0.1392**	**0.2198**	**3.6000e-004**		**6.2600e-003**	**6.2600e-003**		**6.2600e-003**	**6.2600e-003**	**0.0000**	**31.0220**	**31.0220**	**1.6900e-003**	**0.0000**	**31.0643**

3.6 Architectural Coating - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0227	0.0142	0.1962	6.3000e-004	0.0797	3.7000e-004	0.0801	0.0212	3.4000e-004	0.0215	0.0000	59.4575	59.4575	1.4800e-003	1.5000e-003	59.9405
Total	**0.0227**	**0.0142**	**0.1962**	**6.3000e-004**	**0.0797**	**3.7000e-004**	**0.0801**	**0.0212**	**3.4000e-004**	**0.0215**	**0.0000**	**59.4575**	**59.4575**	**1.4800e-003**	**1.5000e-003**	**59.9405**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0663					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.1392	0.2198	3.6000e-004		6.2600e-003	6.2600e-003		6.2600e-003	6.2600e-003	0.0000	31.0220	31.0220	1.6900e-003	0.0000	31.0643
Total	**1.0870**	**0.1392**	**0.2198**	**3.6000e-004**		**6.2600e-003**	**6.2600e-003**		**6.2600e-003**	**6.2600e-003**	**0.0000**	**31.0220**	**31.0220**	**1.6900e-003**	**0.0000**	**31.0643**

3.6 Architectural Coating - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0227	0.0142	0.1962	6.3000e-004	0.0797	3.7000e-004	0.0801	0.0212	3.4000e-004	0.0215	0.0000	59.4575	59.4575	1.4800e-003	1.5000e-003	59.9405
Total	**0.0227**	**0.0142**	**0.1962**	**6.3000e-004**	**0.0797**	**3.7000e-004**	**0.0801**	**0.0212**	**3.4000e-004**	**0.0215**	**0.0000**	**59.4575**	**59.4575**	**1.4800e-003**	**1.5000e-003**	**59.9405**

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1452					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3200	33.3200	1.8200e-003	0.0000	33.3654
Total	**1.1675**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3200**	**33.3200**	**1.8200e-003**	**0.0000**	**33.3654**

3.6 Architectural Coating - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0231	0.0139	0.1993	6.5000e-004	0.0856	3.8000e-004	0.0860	0.0228	3.5000e-004	0.0231	0.0000	62.4105	62.4105	1.4500e-003	1.5200e-003	62.8996
Total	**0.0231**	**0.0139**	**0.1993**	**6.5000e-004**	**0.0856**	**3.8000e-004**	**0.0860**	**0.0228**	**3.5000e-004**	**0.0231**	**0.0000**	**62.4105**	**62.4105**	**1.4500e-003**	**1.5200e-003**	**62.8996**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1452					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3199	33.3199	1.8200e-003	0.0000	33.3654
Total	**1.1675**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3199**	**33.3199**	**1.8200e-003**	**0.0000**	**33.3654**

3.6 Architectural Coating - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0231	0.0139	0.1993	6.5000e-004	0.0856	3.8000e-004	0.0860	0.0228	3.5000e-004	0.0231	0.0000	62.4105	62.4105	1.4500e-003	1.5200e-003	62.8996
Total	**0.0231**	**0.0139**	**0.1993**	**6.5000e-004**	**0.0856**	**3.8000e-004**	**0.0860**	**0.0228**	**3.5000e-004**	**0.0231**	**0.0000**	**62.4105**	**62.4105**	**1.4500e-003**	**1.5200e-003**	**62.8996**

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0355					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0202	0.1352	0.2135	3.5000e-004		6.0800e-003	6.0800e-003		6.0800e-003	6.0800e-003	0.0000	30.1284	30.1284	1.6400e-003	0.0000	30.1695
Total	**1.0557**	**0.1352**	**0.2135**	**3.5000e-004**		**6.0800e-003**	**6.0800e-003**		**6.0800e-003**	**6.0800e-003**	**0.0000**	**30.1284**	**30.1284**	**1.6400e-003**	**0.0000**	**30.1695**

3.6 Architectural Coating - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0198	0.0115	0.1714	5.8000e-004	0.0774	3.3000e-004	0.0777	0.0206	3.0000e-004	0.0209	0.0000	55.2425	55.2425	1.2100e-003	1.3100e-003	55.6623
Total	**0.0198**	**0.0115**	**0.1714**	**5.8000e-004**	**0.0774**	**3.3000e-004**	**0.0777**	**0.0206**	**3.0000e-004**	**0.0209**	**0.0000**	**55.2425**	**55.2425**	**1.2100e-003**	**1.3100e-003**	**55.6623**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0355					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0202	0.1352	0.2135	3.5000e-004		6.0800e-003	6.0800e-003		6.0800e-003	6.0800e-003	0.0000	30.1284	30.1284	1.6400e-003	0.0000	30.1694
Total	**1.0557**	**0.1352**	**0.2135**	**3.5000e-004**		**6.0800e-003**	**6.0800e-003**		**6.0800e-003**	**6.0800e-003**	**0.0000**	**30.1284**	**30.1284**	**1.6400e-003**	**0.0000**	**30.1694**

3.6 Architectural Coating - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0198	0.0115	0.1714	5.8000e-004	0.0774	3.3000e-004	0.0777	0.0206	3.0000e-004	0.0209	0.0000	55.2425	55.2425	1.2100e-003	1.3100e-003	55.6623
Total	**0.0198**	**0.0115**	**0.1714**	**5.8000e-004**	**0.0774**	**3.3000e-004**	**0.0777**	**0.0206**	**3.0000e-004**	**0.0209**	**0.0000**	**55.2425**	**55.2425**	**1.2100e-003**	**1.3100e-003**	**55.6623**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	0.00	0.00	0.00		
Other Asphalt Surfaces	0.00	0.00	0.00		
Regional Shopping Center	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Congregate Care (Assisted Living)	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Other Asphalt Surfaces	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	198.6530	198.6530	0.0321	3.9000e-003	200.6173
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	198.6530	198.6530	0.0321	3.9000e-003	200.6173
NaturalGas Mitigated	0.0284	0.2429	0.1053	1.5500e-003		0.0196	0.0196		0.0196	0.0196	0.0000	280.9815	280.9815	5.3900e-003	5.1500e-003	282.6512
NaturalGas Unmitigated	0.0284	0.2429	0.1053	1.5500e-003		0.0196	0.0196		0.0196	0.0196	0.0000	280.9815	280.9815	5.3900e-003	5.1500e-003	282.6512

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Congregate Care (Assisted Living)	1.25725e+006	6.7800e-003	0.0579	0.0247	3.7000e-004		4.6800e-003	4.6800e-003		4.6800e-003	4.6800e-003	0.0000	67.0918	67.0918	1.2900e-003	1.2300e-003	67.4905
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	93600	5.0000e-004	4.5900e-003	3.8500e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9949	4.9949	1.0000e-004	9.0000e-005	5.0245
Single Family Housing	3.91454e+006	0.0211	0.1804	0.0768	1.1500e-003		0.0146	0.0146		0.0146	0.0146	0.0000	208.8949	208.8949	4.0000e-003	3.8300e-003	210.1363
Total		**0.0284**	**0.2429**	**0.1053**	**1.5500e-003**		**0.0196**	**0.0196**		**0.0196**	**0.0196**	**0.0000**	**280.9815**	**280.9815**	**5.3900e-003**	**5.1500e-003**	**282.6512**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Congregate Care (Assisted Living)	1.25725e+006	6.7800e-003	0.0579	0.0247	3.7000e-004		4.6800e-003	4.6800e-003		4.6800e-003	4.6800e-003	0.0000	67.0918	67.0918	1.2900e-003	1.2300e-003	67.4905
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	93600	5.0000e-004	4.5900e-003	3.8500e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9949	4.9949	1.0000e-004	9.0000e-005	5.0245
Single Family Housing	3.91454e+006	0.0211	0.1804	0.0768	1.1500e-003		0.0146	0.0146		0.0146	0.0146	0.0000	208.8949	208.8949	4.0000e-003	3.8300e-003	210.1363
Total		**0.0284**	**0.2429**	**0.1053**	**1.5500e-003**		**0.0196**	**0.0196**		**0.0196**	**0.0196**	**0.0000**	**280.9815**	**280.9815**	**5.3900e-003**	**5.1500e-003**	**282.6512**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Congregate Care (Assisted Living)	579965	53.6605	8.6800e-003	1.0500e-003	54.1911
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	415600	38.4529	6.2200e-003	7.5000e-004	38.8331
Single Family Housing	1.15148e+006	106.5396	0.0172	2.0900e-003	107.5931
Total		**198.6530**	**0.0321**	**3.8900e-003**	**200.6173**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Congregate Care (Assisted Living)	579965	53.6605	8.6800e-003	1.0500e-003	54.1911
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	415600	38.4529	6.2200e-003	7.5000e-004	38.8331
Single Family Housing	1.15148e+006	106.5396	0.0172	2.0900e-003	107.5931
Total		**198.6530**	**0.0321**	**3.8900e-003**	**200.6173**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.2533	0.0328	2.6556	1.5900e-003		0.0860	0.0860		0.0860	0.0860	9.8727	3.6032	13.4759	0.0496	0.0000	14.7161
Unmitigated	2.2533	0.0328	2.6556	1.5900e-003		0.0860	0.0860		0.0860	0.0860	9.8727	3.6032	13.4759	0.0496	0.0000	14.7161

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3247					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.8126					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0498	7.3700e-003	0.4520	1.4700e-003		0.0737	0.0737		0.0737	0.0737	9.8727	0.0000	9.8727	0.0462	0.0000	11.0266
Landscaping	0.0662	0.0254	2.2037	1.2000e-004		0.0122	0.0122		0.0122	0.0122	0.0000	3.6032	3.6032	3.4500e-003	0.0000	3.6895
Total	**2.2533**	**0.0328**	**2.6556**	**1.5900e-003**		**0.0860**	**0.0860**		**0.0860**	**0.0860**	**9.8727**	**3.6032**	**13.4759**	**0.0496**	**0.0000**	**14.7161**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3247					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.8126					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0498	7.3700e-003	0.4520	1.4700e-003		0.0737	0.0737		0.0737	0.0737	9.8727	0.0000	9.8727	0.0462	0.0000	11.0266
Landscaping	0.0662	0.0254	2.2037	1.2000e-004		0.0122	0.0122		0.0122	0.0122	0.0000	3.6032	3.6032	3.4500e-003	0.0000	3.6895
Total	**2.2533**	**0.0328**	**2.6556**	**1.5900e-003**		**0.0860**	**0.0860**		**0.0860**	**0.0860**	**9.8727**	**3.6032**	**13.4759**	**0.0496**	**0.0000**	**14.7161**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	22.7890	0.7296	0.0175	46.2377
Unmitigated	22.7890	0.7296	0.0175	46.2377

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Congregate Care (Assisted Living)	9.7731 / 6.1613	9.9887	0.3196	7.6500e-003	20.2590
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	2.9629 / 1.81597	3.0114	0.0969	2.3200e-003	6.1249
Single Family Housing	9.57764 / 6.03808	9.7889	0.3132	7.5000e-003	19.8538
Total		**22.7890**	**0.7296**	**0.0175**	**46.2377**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Congregate Care (Assisted Living)	9.7731 / 6.1613	9.9887	0.3196	7.6500e-003	20.2590
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	2.9629 / 1.81597	3.0114	0.0969	2.3200e-003	6.1249
Single Family Housing	9.57764 / 6.03808	9.7889	0.3132	7.5000e-003	19.8538
Total		**22.7890**	**0.7296**	**0.0175**	**46.2377**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	72.1186	4.2621	0.0000	178.6709
Unmitigated	72.1186	4.2621	0.0000	178.6709

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Congregate Care (Assisted Living)	136.88	27.7854	1.6421	0.0000	68.8372
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	42	8.5256	0.5039	0.0000	21.1219
Single Family Housing	176.4	35.8076	2.1162	0.0000	88.7118
Total		**72.1186**	**4.2621**	**0.0000**	**178.6709**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Congregate Care (Assisted Living)	136.88	27.7854	1.6421	0.0000	68.8372
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	42	8.5256	0.5039	0.0000	21.1219
Single Family Housing	176.4	35.8076	2.1162	0.0000	88.7118
Total		**72.1186**	**4.2621**	**0.0000**	**178.6709**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch - Reduced Density Alternative

Bay Area AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	13.20	Acre	13.20	574,992.00	0
Congregate Care (Assisted Living)	150.00	Dwelling Unit	1.50	150,000.00	429
Single Family Housing	147.00	Dwelling Unit	31.20	264,600.00	420
Regional Shopping Center	40.00	1000sqft	1.50	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site plan.

Construction Phase - Grading phase timing adjusted to account for soil import.

Grading - Material import updated per site-specific information.

Vehicle Trips - Operational emissions not modeled.

Woodstoves - Operational emissions not modeled.

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	55.00	740.00
tblConstructionPhase	NumDays	75.00	120.00
tblConstructionPhase	PhaseEndDate	6/25/2027	11/12/2027
tblConstructionPhase	PhaseEndDate	8/23/2024	10/25/2024
tblConstructionPhase	PhaseEndDate	9/10/2027	1/10/2025
tblConstructionPhase	PhaseStartDate	9/11/2027	1/25/2025
tblConstructionPhase	PhaseStartDate	8/24/2024	1/11/2025
tblConstructionPhase	PhaseStartDate	6/26/2027	10/26/2024
tblFireplaces	NumberGas	22.50	0.00
tblFireplaces	NumberGas	36.75	0.00
tblFireplaces	NumberWood	25.50	0.00
tblFireplaces	NumberWood	63.21	0.00
tblGrading	MaterialImported	0.00	300,000.00
tblLandUse	LotAcreage	9.38	1.50
tblLandUse	LotAcreage	47.73	31.20
tblLandUse	LotAcreage	0.92	1.50
tblVehicleTrips	ST_TR	2.93	0.00
tblVehicleTrips	ST_TR	46.12	0.00
tblVehicleTrips	ST_TR	9.54	0.00
tblVehicleTrips	SU_TR	3.15	0.00
tblVehicleTrips	SU_TR	21.10	0.00
tblVehicleTrips	SU_TR	8.55	0.00
tblVehicleTrips	WD_TR	2.60	0.00
tblVehicleTrips	WD_TR	37.75	0.00
tblVehicleTrips	WD_TR	9.44	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.9350	73.2659	38.1418	0.2489	19.8049	1.6817	21.0349	10.1417	1.5599	11.2733	0.0000	26,381.7992	26,381.7992	2.6244	3.2094	27,403.7961
2025	11.6332	19.9235	30.0438	0.0891	4.9918	0.6324	5.6242	1.3445	0.5981	1.9425	0.0000	9,088.9442	9,088.9442	0.7499	0.4884	9,253.2471
2026	11.5644	19.8347	29.4404	0.0876	4.9918	0.6313	5.6231	1.3445	0.5971	1.9416	0.0000	8,958.8599	8,958.8599	0.7430	0.4765	9,119.4370
2027	11.5019	19.7483	28.9299	0.0862	4.9918	0.6301	5.6219	1.3445	0.5959	1.9404	0.0000	8,832.1030	8,832.1030	0.7368	0.4647	8,989.0164
Maximum	**11.6332**	**73.2659**	**38.1418**	**0.2489**	**19.8049**	**1.6817**	**21.0349**	**10.1417**	**1.5599**	**11.2733**	**0.0000**	**26,381.7992**	**26,381.7992**	**2.6244**	**3.2094**	**27,403.7961**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.9350	73.2659	38.1418	0.2489	19.8049	1.6817	21.0349	10.1417	1.5599	11.2733	0.0000	26,381.7992	26,381.7992	2.6244	3.2094	27,403.7961
2025	11.6332	19.9235	30.0438	0.0891	4.9918	0.6324	5.6242	1.3445	0.5981	1.9425	0.0000	9,088.9442	9,088.9442	0.7499	0.4884	9,253.2471
2026	11.5644	19.8347	29.4404	0.0876	4.9918	0.6313	5.6231	1.3445	0.5971	1.9416	0.0000	8,958.8599	8,958.8599	0.7430	0.4765	9,119.4370
2027	11.5019	19.7483	28.9299	0.0862	4.9918	0.6301	5.6219	1.3445	0.5959	1.9404	0.0000	8,832.1030	8,832.1030	0.7368	0.4647	8,989.0164
Maximum	**11.6332**	**73.2659**	**38.1418**	**0.2489**	**19.8049**	**1.6817**	**21.0349**	**10.1417**	**1.5599**	**11.2733**	**0.0000**	**26,381.7992**	**26,381.7992**	**2.6244**	**3.2094**	**27,403.7961**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	17.7237	1.0638	72.4070	0.1577		7.9535	7.9535		7.9535	7.9535	1,153.8781	44.1317	1,198.0098	5.4364	0.0000	1,333.9204
Energy	0.1556	1.3309	0.5768	8.4900e-003		0.1075	0.1075		0.1075	0.1075		1,697.1457	1,697.1457	0.0325	0.0311	1,707.2309
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**17.8793**	**2.3947**	**72.9838**	**0.1661**	**0.0000**	**8.0609**	**8.0609**	**0.0000**	**8.0609**	**8.0609**	**1,153.8781**	**1,741.2773**	**2,895.1554**	**5.4690**	**0.0311**	**3,041.1514**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	17.7237	1.0638	72.4070	0.1577		7.9535	7.9535		7.9535	7.9535	1,153.8781	44.1317	1,198.0098	5.4364	0.0000	1,333.9204
Energy	0.1556	1.3309	0.5768	8.4900e-003		0.1075	0.1075		0.1075	0.1075		1,697.1457	1,697.1457	0.0325	0.0311	1,707.2309
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**17.8793**	**2.3947**	**72.9838**	**0.1661**	**0.0000**	**8.0609**	**8.0609**	**0.0000**	**8.0609**	**8.0609**	**1,153.8781**	**1,741.2773**	**2,895.1554**	**5.4690**	**0.0311**	**3,041.1514**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/10/2024	5	30	
2	Grading	Grading	5/11/2024	10/25/2024	5	120	
3	Building Construction	Building Construction	1/11/2025	11/12/2027	5	740	
4	Paving	Paving	10/26/2024	1/10/2025	5	55	
5	Architectural Coating	Architectural Coating	1/25/2025	11/26/2027	5	740	

Acres of Grading (Site Preparation Phase): 45

Acres of Grading (Grading Phase): 360

Acres of Paving: 13.2

Residential Indoor: 839,565; Residential Outdoor: 279,855; Non-Residential Indoor: 60,000; Non-Residential Outdoor: 20,000; Striped Parking Area: 34,500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	415.00	133.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	83.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310		3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**		**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0455	0.0250	0.4010	1.2400e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		127.9370	127.9370	2.9900e-003	2.9000e-003	128.8764
Total	**0.0455**	**0.0250**	**0.4010**	**1.2400e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**127.9370**	**127.9370**	**2.9900e-003**	**2.9000e-003**	**128.8764**

3.2 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310	0.0000	3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**	**0.0000**	**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0455	0.0250	0.4010	1.2400e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		127.9370	127.9370	2.9900e-003	2.9000e-003	128.8764
Total	**0.0455**	**0.0250**	**0.4010**	**1.2400e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**127.9370**	**127.9370**	**2.9900e-003**	**2.9000e-003**	**128.8764**

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286		6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**		**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6663	40.8612	9.9734	0.1854	5.4661	0.3455	5.8117	1.4983	0.3306	1.8289		20,229.8983	20,229.8983	0.6774	3.2061	21,202.2596
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0505	0.0278	0.4456	1.3800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		142.1522	142.1522	3.3200e-003	3.2200e-003	143.1960
Total	**0.7169**	**40.8890**	**10.4190**	**0.1868**	**5.6304**	**0.3463**	**5.9767**	**1.5419**	**0.3313**	**1.8732**		**20,372.0505**	**20,372.0505**	**0.6807**	**3.2094**	**21,345.4556**

3.3 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286	0.0000	6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**	**0.0000**	**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6663	40.8612	9.9734	0.1854	5.4661	0.3455	5.8117	1.4983	0.3306	1.8289		20,229.8983	20,229.8983	0.6774	3.2061	21,202.2596
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0505	0.0278	0.4456	1.3800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		142.1522	142.1522	3.3200e-003	3.2200e-003	143.1960
Total	**0.7169**	**40.8890**	**10.4190**	**0.1868**	**5.6304**	**0.3463**	**5.9767**	**1.5419**	**0.3313**	**1.8732**		**20,372.0505**	**20,372.0505**	**0.6807**	**3.2094**	**21,345.4556**

3.4 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1372	5.6858	1.7513	0.0261	0.9008	0.0348	0.9356	0.2593	0.0333	0.2926		2,796.4535	2,796.4535	0.0585	0.4132	2,921.0457
Worker	0.9850	0.5188	8.6656	0.0276	3.4091	0.0154	3.4245	0.9043	0.0142	0.9184		2,878.8069	2,878.8069	0.0626	0.0627	2,899.0595
Total	**1.1221**	**6.2045**	**10.4169**	**0.0537**	**4.3100**	**0.0502**	**4.3602**	**1.1636**	**0.0475**	**1.2111**		**5,675.2604**	**5,675.2604**	**0.1211**	**0.4759**	**5,820.1053**

3.4 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.474 4	2,556.474 4	0.6010		2,571.498 1
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.474 4**	**2,556.474 4**	**0.6010**		**2,571.498 1**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1372	5.6858	1.7513	0.0261	0.9008	0.0348	0.9356	0.2593	0.0333	0.2926		2,796.453 5	2,796.453 5	0.0585	0.4132	2,921.045 7
Worker	0.9850	0.5188	8.6656	0.0276	3.4091	0.0154	3.4245	0.9043	0.0142	0.9184		2,878.806 9	2,878.806 9	0.0626	0.0627	2,899.059 5
Total	**1.1221**	**6.2045**	**10.4169**	**0.0537**	**4.3100**	**0.0502**	**4.3602**	**1.1636**	**0.0475**	**1.2111**		**5,675.260 4**	**5,675.260 4**	**0.1211**	**0.4759**	**5,820.105 3**

3.4 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1342	5.6526	1.7261	0.0256	0.9009	0.0346	0.9355	0.2594	0.0331	0.2925		2,745.1970	2,745.1970	0.0583	0.4054	2,867.4547
Worker	0.9301	0.4724	8.1837	0.0268	3.4091	0.0147	3.4238	0.9043	0.0135	0.9178		2,813.1171	2,813.1171	0.0571	0.0593	2,832.2103
Total	**1.0643**	**6.1250**	**9.9098**	**0.0523**	**4.3100**	**0.0493**	**4.3593**	**1.1636**	**0.0467**	**1.2103**		**5,558.3140**	**5,558.3140**	**0.1153**	**0.4647**	**5,699.6650**

3.4 Building Construction - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1342	5.6526	1.7261	0.0256	0.9009	0.0346	0.9355	0.2594	0.0331	0.2925		2,745.1970	2,745.1970	0.0583	0.4054	2,867.4547
Worker	0.9301	0.4724	8.1837	0.0268	3.4091	0.0147	3.4238	0.9043	0.0135	0.9178		2,813.1171	2,813.1171	0.0571	0.0593	2,832.2103
Total	**1.0643**	**6.1250**	**9.9098**	**0.0523**	**4.3100**	**0.0493**	**4.3593**	**1.1636**	**0.0467**	**1.2103**		**5,558.3140**	**5,558.3140**	**0.1153**	**0.4647**	**5,699.6650**

3.4 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1316	5.6127	1.7041	0.0251	0.9009	0.0344	0.9353	0.2594	0.0329	0.2922		2,689.8351	2,689.8351	0.0577	0.3970	2,809.5952
Worker	0.8802	0.4337	7.7766	0.0260	3.4091	0.0139	3.4230	0.9043	0.0128	0.9170		2,753.6213	2,753.6213	0.0523	0.0564	2,771.7427
Total	**1.0118**	**6.0463**	**9.4808**	**0.0511**	**4.3100**	**0.0482**	**4.3582**	**1.1636**	**0.0456**	**1.2092**		**5,443.4563**	**5,443.4563**	**0.1100**	**0.4535**	**5,581.3379**

3.4 Building Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1316	5.6127	1.7041	0.0251	0.9009	0.0344	0.9353	0.2594	0.0329	0.2922		2,689.8351	2,689.8351	0.0577	0.3970	2,809.5952
Worker	0.8802	0.4337	7.7766	0.0260	3.4091	0.0139	3.4230	0.9043	0.0128	0.9170		2,753.6213	2,753.6213	0.0523	0.0564	2,771.7427
Total	**1.0118**	**6.0463**	**9.4808**	**0.0511**	**4.3100**	**0.0482**	**4.3582**	**1.1636**	**0.0456**	**1.2092**		**5,443.4563**	**5,443.4563**	**0.1100**	**0.4535**	**5,581.3379**

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.6288					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6170**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0379	0.0208	0.3342	1.0300e-003	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		106.6142	106.6142	2.4900e-003	2.4200e-003	107.3970
Total	**0.0379**	**0.0208**	**0.3342**	**1.0300e-003**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**106.6142**	**106.6142**	**2.4900e-003**	**2.4200e-003**	**107.3970**

3.5 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.6288					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6170**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0379	0.0208	0.3342	1.0300e-003	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		106.6142	106.6142	2.4900e-003	2.4200e-003	107.3970
Total	**0.0379**	**0.0208**	**0.3342**	**1.0300e-003**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**106.6142**	**106.6142**	**2.4900e-003**	**2.4200e-003**	**107.3970**

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.6288					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.5440**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0356	0.0188	0.3132	1.0000e-003	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		104.0533	104.0533	2.2600e-003	2.2700e-003	104.7853
Total	**0.0356**	**0.0188**	**0.3132**	**1.0000e-003**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**104.0533**	**104.0533**	**2.2600e-003**	**2.2700e-003**	**104.7853**

3.5 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850	0.0000	2,206.745 2	2,206.745 2	0.7137		2,224.587 8
Paving	0.6288					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.5440**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**	**0.0000**	**2,206.745 2**	**2,206.745 2**	**0.7137**		**2,224.587 8**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0356	0.0188	0.3132	1.0000e-003	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		104.0533	104.0533	2.2600e-003	2.2700e-003	104.7853
Total	**0.0356**	**0.0188**	**0.3132**	**1.0000e-003**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**104.0533**	**104.0533**	**2.2600e-003**	**2.2700e-003**	**104.7853**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1970	0.1038	1.7331	5.5300e-003	0.6818	3.0800e-003	0.6849	0.1809	2.8400e-003	0.1837		575.7614	575.7614	0.0125	0.0125	579.8119
Total	**0.1970**	**0.1038**	**1.7331**	**5.5300e-003**	**0.6818**	**3.0800e-003**	**0.6849**	**0.1809**	**2.8400e-003**	**0.1837**		**575.7614**	**575.7614**	**0.0125**	**0.0125**	**579.8119**

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1970	0.1038	1.7331	5.5300e-003	0.6818	3.0800e-003	0.6849	0.1809	2.8400e-003	0.1837		575.7614	575.7614	0.0125	0.0125	579.8119
Total	**0.1970**	**0.1038**	**1.7331**	**5.5300e-003**	**0.6818**	**3.0800e-003**	**0.6849**	**0.1809**	**2.8400e-003**	**0.1837**		**575.7614**	**575.7614**	**0.0125**	**0.0125**	**579.8119**

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1860	0.0945	1.6368	5.3600e-003	0.6818	2.9400e-003	0.6848	0.1809	2.7000e-003	0.1836		562.6234	562.6234	0.0114	0.0119	566.4421
Total	**0.1860**	**0.0945**	**1.6368**	**5.3600e-003**	**0.6818**	**2.9400e-003**	**0.6848**	**0.1809**	**2.7000e-003**	**0.1836**		**562.6234**	**562.6234**	**0.0114**	**0.0119**	**566.4421**

3.6 Architectural Coating - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1860	0.0945	1.6368	5.3600e-003	0.6818	2.9400e-003	0.6848	0.1809	2.7000e-003	0.1836		562.6234	562.6234	0.0114	0.0119	566.4421
Total	**0.1860**	**0.0945**	**1.6368**	**5.3600e-003**	**0.6818**	**2.9400e-003**	**0.6848**	**0.1809**	**2.7000e-003**	**0.1836**		**562.6234**	**562.6234**	**0.0114**	**0.0119**	**566.4421**

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1760	0.0867	1.5553	5.2000e-003	0.6818	2.7700e-003	0.6846	0.1809	2.5500e-003	0.1834		550.7243	550.7243	0.0105	0.0113	554.3485
Total	**0.1760**	**0.0867**	**1.5553**	**5.2000e-003**	**0.6818**	**2.7700e-003**	**0.6846**	**0.1809**	**2.5500e-003**	**0.1834**		**550.7243**	**550.7243**	**0.0105**	**0.0113**	**554.3485**

3.6 Architectural Coating - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1760	0.0867	1.5553	5.2000e-003	0.6818	2.7700e-003	0.6846	0.1809	2.5500e-003	0.1834		550.7243	550.7243	0.0105	0.0113	554.3485
Total	**0.1760**	**0.0867**	**1.5553**	**5.2000e-003**	**0.6818**	**2.7700e-003**	**0.6846**	**0.1809**	**2.5500e-003**	**0.1834**		**550.7243**	**550.7243**	**0.0105**	**0.0113**	**554.3485**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	0.00	0.00	0.00		
Other Asphalt Surfaces	0.00	0.00	0.00		
Regional Shopping Center	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Congregate Care (Assisted	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Other Asphalt Surfaces	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1556	1.3309	0.5768	8.4900e-003		0.1075	0.1075		0.1075	0.1075		1,697.1457	1,697.1457	0.0325	0.0311	1,707.2309
NaturalGas Unmitigated	0.1556	1.3309	0.5768	8.4900e-003		0.1075	0.1075		0.1075	0.1075		1,697.1457	1,697.1457	0.0325	0.0311	1,707.2309

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3444.53	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	256.438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	10724.8	0.1157	0.9884	0.4206	6.3100e-003		0.0799	0.0799		0.0799	0.0799		1,261.7381	1,261.7381	0.0242	0.0231	1,269.2360
Total		**0.1556**	**1.3309**	**0.5768**	**8.4900e-003**		**0.1075**	**0.1075**		**0.1075**	**0.1075**		**1,697.1457**	**1,697.1457**	**0.0325**	**0.0311**	**1,707.2309**

5.2 Energy by Land Use - NaturalGas

<u>Mitigated</u>

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3.44453	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.256438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	10.7248	0.1157	0.9884	0.4206	6.3100e-003		0.0799	0.0799		0.0799	0.0799		1,261.7381	1,261.7381	0.0242	0.0231	1,269.2360
Total		**0.1556**	**1.3309**	**0.5768**	**8.4900e-003**		**0.1075**	**0.1075**		**0.1075**	**0.1075**		**1,697.1457**	**1,697.1457**	**0.0325**	**0.0311**	**1,707.2309**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	17.7237	1.0638	72.4070	0.1577		7.9535	7.9535		7.9535	7.9535	1,153.878 1	44.1317	1,198.009 8	5.4364	0.0000	1,333.920 4
Unmitigated	17.7237	1.0638	72.4070	0.1577		7.9535	7.9535		7.9535	7.9535	1,153.878 1	44.1317	1,198.009 8	5.4364	0.0000	1,333.920 4

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.7792					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	9.9321					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	5.2769	0.7818	47.9219	0.1564		7.8176	7.8176		7.8176	7.8176	1,153.878 1	0.0000	1,153.878 1	5.3942	0.0000	1,288.731 8
Landscaping	0.7355	0.2820	24.4851	1.2900e-003		0.1359	0.1359		0.1359	0.1359		44.1317	44.1317	0.0423		45.1887
Total	**17.7237**	**1.0638**	**72.4070**	**0.1576**		**7.9535**	**7.9535**		**7.9535**	**7.9535**	**1,153.878 1**	**44.1317**	**1,198.009 8**	**5.4364**	**0.0000**	**1,333.920 4**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.7792					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	9.9321					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	5.2769	0.7818	47.9219	0.1564		7.8176	7.8176		7.8176	7.8176	1,153.878 1	0.0000	1,153.878 1	5.3942	0.0000	1,288.731 8
Landscaping	0.7355	0.2820	24.4851	1.2900e-003		0.1359	0.1359		0.1359	0.1359		44.1317	44.1317	0.0423		45.1887
Total	**17.7237**	**1.0638**	**72.4070**	**0.1576**		**7.9535**	**7.9535**		**7.9535**	**7.9535**	**1,153.878 1**	**44.1317**	**1,198.009 8**	**5.4364**	**0.0000**	**1,333.920 4**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Albers Ranch - Reduced Density Alternative

Bay Area AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	13.20	Acre	13.20	574,992.00	0
Congregate Care (Assisted Living)	150.00	Dwelling Unit	1.50	150,000.00	429
Single Family Housing	147.00	Dwelling Unit	31.20	264,600.00	420
Regional Shopping Center	40.00	1000sqft	1.50	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage adjusted to match site plan.

Construction Phase - Grading phase timing adjusted to account for soil import.

Grading - Material import updated per site-specific information.

Vehicle Trips - Operational emissions not modeled.

Woodstoves - Operational emissions not modeled.

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	55.00	740.00
tblConstructionPhase	NumDays	75.00	120.00
tblConstructionPhase	PhaseEndDate	6/25/2027	11/12/2027
tblConstructionPhase	PhaseEndDate	8/23/2024	10/25/2024
tblConstructionPhase	PhaseEndDate	9/10/2027	1/10/2025
tblConstructionPhase	PhaseStartDate	9/11/2027	1/25/2025
tblConstructionPhase	PhaseStartDate	8/24/2024	1/11/2025
tblConstructionPhase	PhaseStartDate	6/26/2027	10/26/2024
tblFireplaces	NumberGas	22.50	0.00
tblFireplaces	NumberGas	36.75	0.00
tblFireplaces	NumberWood	25.50	0.00
tblFireplaces	NumberWood	63.21	0.00
tblGrading	MaterialImported	0.00	300,000.00
tblLandUse	LotAcreage	9.38	1.50
tblLandUse	LotAcreage	47.73	31.20
tblLandUse	LotAcreage	0.92	1.50
tblVehicleTrips	ST_TR	2.93	0.00
tblVehicleTrips	ST_TR	46.12	0.00
tblVehicleTrips	ST_TR	9.54	0.00
tblVehicleTrips	SU_TR	3.15	0.00
tblVehicleTrips	SU_TR	21.10	0.00
tblVehicleTrips	SU_TR	8.55	0.00
tblVehicleTrips	WD_TR	2.60	0.00
tblVehicleTrips	WD_TR	37.75	0.00
tblVehicleTrips	WD_TR	9.44	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.8959	75.6302	38.2520	0.2489	19.8049	1.6822	21.0349	10.1417	1.5604	11.2733	0.0000	26,391.0696	26,391.0696	2.6226	3.2131	27,414.1295
2025	11.6672	20.3994	29.7288	0.0868	4.9918	0.6325	5.6243	1.3445	0.5982	1.9427	0.0000	8,849.2166	8,849.2166	0.7603	0.5008	9,017.4496
2026	11.6003	20.2958	29.1656	0.0854	4.9918	0.6314	5.6232	1.3445	0.5972	1.9417	0.0000	8,725.0075	8,725.0075	0.7527	0.4882	8,889.2955
2027	11.5390	20.1964	28.6867	0.0840	4.9918	0.6302	5.6220	1.3445	0.5960	1.9405	0.0000	8,603.4710	8,603.4710	0.7458	0.4758	8,763.9116
Maximum	**11.6672**	**75.6302**	**38.2520**	**0.2489**	**19.8049**	**1.6822**	**21.0349**	**10.1417**	**1.5604**	**11.2733**	**0.0000**	**26,391.0696**	**26,391.0696**	**2.6226**	**3.2131**	**27,414.1295**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.8959	75.6302	38.2520	0.2489	19.8049	1.6822	21.0349	10.1417	1.5604	11.2733	0.0000	26,391.0696	26,391.0696	2.6226	3.2131	27,414.1295
2025	11.6672	20.3994	29.7288	0.0868	4.9918	0.6325	5.6243	1.3445	0.5982	1.9427	0.0000	8,849.2166	8,849.2166	0.7603	0.5008	9,017.4496
2026	11.6003	20.2958	29.1656	0.0854	4.9918	0.6314	5.6232	1.3445	0.5972	1.9417	0.0000	8,725.0075	8,725.0075	0.7527	0.4882	8,889.2955
2027	11.5390	20.1964	28.6867	0.0840	4.9918	0.6302	5.6220	1.3445	0.5960	1.9405	0.0000	8,603.4710	8,603.4710	0.7458	0.4758	8,763.9116
Maximum	**11.6672**	**75.6302**	**38.2520**	**0.2489**	**19.8049**	**1.6822**	**21.0349**	**10.1417**	**1.5604**	**11.2733**	**0.0000**	**26,391.0696**	**26,391.0696**	**2.6226**	**3.2131**	**27,414.1295**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	17.7237	1.0638	72.4070	0.1577		7.9535	7.9535		7.9535	7.9535	1,153.8781	44.1317	1,198.0098	5.4364	0.0000	1,333.9204
Energy	0.1556	1.3309	0.5768	8.4900e-003		0.1075	0.1075		0.1075	0.1075		1,697.1457	1,697.1457	0.0325	0.0311	1,707.2309
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**17.8793**	**2.3947**	**72.9838**	**0.1661**	**0.0000**	**8.0609**	**8.0609**	**0.0000**	**8.0609**	**8.0609**	**1,153.8781**	**1,741.2773**	**2,895.1554**	**5.4690**	**0.0311**	**3,041.1514**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	17.7237	1.0638	72.4070	0.1577		7.9535	7.9535		7.9535	7.9535	1,153.8781	44.1317	1,198.0098	5.4364	0.0000	1,333.9204
Energy	0.1556	1.3309	0.5768	8.4900e-003		0.1075	0.1075		0.1075	0.1075		1,697.1457	1,697.1457	0.0325	0.0311	1,707.2309
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**17.8793**	**2.3947**	**72.9838**	**0.1661**	**0.0000**	**8.0609**	**8.0609**	**0.0000**	**8.0609**	**8.0609**	**1,153.8781**	**1,741.2773**	**2,895.1554**	**5.4690**	**0.0311**	**3,041.1514**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2024	5/10/2024	5	30	
2	Grading	Grading	5/11/2024	10/25/2024	5	120	
3	Building Construction	Building Construction	1/11/2025	11/12/2027	5	740	
4	Paving	Paving	10/26/2024	1/10/2025	5	55	
5	Architectural Coating	Architectural Coating	1/25/2025	11/26/2027	5	740	

Acres of Grading (Site Preparation Phase): 45

Acres of Grading (Grading Phase): 360

Acres of Paving: 13.2

Residential Indoor: 839,565; Residential Outdoor: 279,855; Non-Residential Indoor: 60,000; Non-Residential Outdoor: 20,000; Striped Parking Area: 34,500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	37,500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	415.00	133.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	83.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310		3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**		**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0468	0.0308	0.3855	1.1500e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		118.8877	118.8877	3.4100e-003	3.3400e-003	119.9678
Total	**0.0468**	**0.0308**	**0.3855**	**1.1500e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**118.8877**	**118.8877**	**3.4100e-003**	**3.3400e-003**	**119.9678**

3.2 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310	0.0000	3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**	**0.0000**	**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0468	0.0308	0.3855	1.1500e-003	0.1479	7.0000e-004	0.1486	0.0392	6.4000e-004	0.0399		118.8877	118.8877	3.4100e-003	3.3400e-003	119.9678
Total	**0.0468**	**0.0308**	**0.3855**	**1.1500e-003**	**0.1479**	**7.0000e-004**	**0.1486**	**0.0392**	**6.4000e-004**	**0.0399**		**118.8877**	**118.8877**	**3.4100e-003**	**3.3400e-003**	**119.9678**

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286		6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**		**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6257	43.2190	10.1009	0.1856	5.4661	0.3461	5.8122	1.4983	0.3311	1.8294		20,249.2235	20,249.2235	0.6751	3.2094	21,222.4915
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0520	0.0342	0.4283	1.2800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		132.0975	132.0975	3.7900e-003	3.7100e-003	133.2975
Total	**0.6778**	**43.2532**	**10.5291**	**0.1869**	**5.6304**	**0.3468**	**5.9773**	**1.5419**	**0.3318**	**1.8737**		**20,381.3210**	**20,381.3210**	**0.6789**	**3.2131**	**21,355.7890**

3.3 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4863	0.0000	9.4863	3.6966	0.0000	3.6966			0.0000			0.0000
Off-Road	3.2181	32.3770	27.7228	0.0621		1.3354	1.3354		1.2286	1.2286	0.0000	6,009.7487	6,009.7487	1.9437		6,058.3405
Total	**3.2181**	**32.3770**	**27.7228**	**0.0621**	**9.4863**	**1.3354**	**10.8217**	**3.6966**	**1.2286**	**4.9251**	**0.0000**	**6,009.7487**	**6,009.7487**	**1.9437**		**6,058.3405**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6257	43.2190	10.1009	0.1856	5.4661	0.3461	5.8122	1.4983	0.3311	1.8294		20,249.2235	20,249.2235	0.6751	3.2094	21,222.4915
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0520	0.0342	0.4283	1.2800e-003	0.1643	7.8000e-004	0.1651	0.0436	7.1000e-004	0.0443		132.0975	132.0975	3.7900e-003	3.7100e-003	133.2975
Total	**0.6778**	**43.2532**	**10.5291**	**0.1869**	**5.6304**	**0.3468**	**5.9773**	**1.5419**	**0.3318**	**1.8737**		**20,381.3210**	**20,381.3210**	**0.6789**	**3.2131**	**21,355.7890**

3.4 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1319	6.0165	1.8126	0.0261	0.9008	0.0349	0.9358	0.2593	0.0334	0.2928		2,800.6275	2,800.6275	0.0582	0.4142	2,925.5140
Worker	1.0177	0.6398	8.3520	0.0257	3.4091	0.0154	3.4245	0.9043	0.0142	0.9184		2,675.5556	2,675.5556	0.0715	0.0721	2,698.8381
Total	**1.1496**	**6.6563**	**10.1646**	**0.0518**	**4.3100**	**0.0504**	**4.3603**	**1.1636**	**0.0476**	**1.2112**		**5,476.1831**	**5,476.1831**	**0.1297**	**0.4863**	**5,624.3521**

3.4 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1319	6.0165	1.8126	0.0261	0.9008	0.0349	0.9358	0.2593	0.0334	0.2928		2,800.6275	2,800.6275	0.0582	0.4142	2,925.5140
Worker	1.0177	0.6398	8.3520	0.0257	3.4091	0.0154	3.4245	0.9043	0.0142	0.9184		2,675.5556	2,675.5556	0.0715	0.0721	2,698.8381
Total	**1.1496**	**6.6563**	**10.1646**	**0.0518**	**4.3100**	**0.0504**	**4.3603**	**1.1636**	**0.0476**	**1.2112**		**5,476.1831**	**5,476.1831**	**0.1297**	**0.4863**	**5,624.3521**

3.4 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1288	5.9817	1.7868	0.0256	0.9009	0.0348	0.9356	0.2594	0.0332	0.2926		2,749.3638	2,749.3638	0.0579	0.4064	2,871.9081
Worker	0.9646	0.5825	7.9042	0.0249	3.4091	0.0147	3.4238	0.9043	0.0135	0.9178		2,614.7677	2,614.7677	0.0654	0.0682	2,636.7146
Total	**1.0934**	**6.5642**	**9.6910**	**0.0505**	**4.3100**	**0.0494**	**4.3594**	**1.1636**	**0.0468**	**1.2104**		**5,364.1315**	**5,364.1315**	**0.1233**	**0.4745**	**5,508.6227**

3.4 Building Construction - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1288	5.9817	1.7868	0.0256	0.9009	0.0348	0.9356	0.2594	0.0332	0.2926		2,749.3638	2,749.3638	0.0579	0.4064	2,871.9081
Worker	0.9646	0.5825	7.9042	0.0249	3.4091	0.0147	3.4238	0.9043	0.0135	0.9178		2,614.7677	2,614.7677	0.0654	0.0682	2,636.7146
Total	**1.0934**	**6.5642**	**9.6910**	**0.0505**	**4.3100**	**0.0494**	**4.3594**	**1.1636**	**0.0468**	**1.2104**		**5,364.1315**	**5,364.1315**	**0.1233**	**0.4745**	**5,508.6227**

3.4 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1261	5.9397	1.7644	0.0251	0.9009	0.0345	0.9354	0.2594	0.0330	0.2923		2,693.9863	2,693.9863	0.0573	0.3980	2,814.0262
Worker	0.9158	0.5346	7.5238	0.0242	3.4091	0.0139	3.4230	0.9043	0.0128	0.9170		2,559.6352	2,559.6352	0.0601	0.0649	2,580.4629
Total	**1.0418**	**6.4743**	**9.2881**	**0.0493**	**4.3100**	**0.0483**	**4.3583**	**1.1636**	**0.0457**	**1.2094**		**5,253.6215**	**5,253.6215**	**0.1175**	**0.4629**	**5,394.4890**

3.4 Building Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1261	5.9397	1.7644	0.0251	0.9009	0.0345	0.9354	0.2594	0.0330	0.2923		2,693.9863	2,693.9863	0.0573	0.3980	2,814.0262
Worker	0.9158	0.5346	7.5238	0.0242	3.4091	0.0139	3.4230	0.9043	0.0128	0.9170		2,559.6352	2,559.6352	0.0601	0.0649	2,580.4629
Total	**1.0418**	**6.4743**	**9.2881**	**0.0493**	**4.3100**	**0.0483**	**4.3583**	**1.1636**	**0.0457**	**1.2094**		**5,253.6215**	**5,253.6215**	**0.1175**	**0.4629**	**5,394.4890**

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.547 2	2,207.547 2	0.7140		2,225.396 3
Paving	0.6288					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6170**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.547 2**	**2,207.547 2**	**0.7140**		**2,225.396 3**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0390	0.0257	0.3212	9.6000e-004	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		99.0731	99.0731	2.8400e-003	2.7800e-003	99.9731
Total	**0.0390**	**0.0257**	**0.3212**	**9.6000e-004**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**99.0731**	**99.0731**	**2.8400e-003**	**2.7800e-003**	**99.9731**

3.5 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.6288					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6170**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0390	0.0257	0.3212	9.6000e-004	0.1232	5.8000e-004	0.1238	0.0327	5.4000e-004	0.0332		99.0731	99.0731	2.8400e-003	2.7800e-003	99.9731
Total	**0.0390**	**0.0257**	**0.3212**	**9.6000e-004**	**0.1232**	**5.8000e-004**	**0.1238**	**0.0327**	**5.4000e-004**	**0.0332**		**99.0731**	**99.0731**	**2.8400e-003**	**2.7800e-003**	**99.9731**

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.6288					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.5440**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0368	0.0231	0.3019	9.3000e-004	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		96.7068	96.7068	2.5900e-003	2.6100e-003	97.5484
Total	**0.0368**	**0.0231**	**0.3019**	**9.3000e-004**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**96.7068**	**96.7068**	**2.5900e-003**	**2.6100e-003**	**97.5484**

3.5 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850	0.0000	2,206.745 2	2,206.745 2	0.7137		2,224.587 8
Paving	0.6288					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.5440**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**	**0.0000**	**2,206.745 2**	**2,206.745 2**	**0.7137**		**2,224.587 8**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0368	0.0231	0.3019	9.3000e-004	0.1232	5.6000e-004	0.1238	0.0327	5.1000e-004	0.0332		96.7068	96.7068	2.5900e-003	2.6100e-003	97.5484
Total	**0.0368**	**0.0231**	**0.3019**	**9.3000e-004**	**0.1232**	**5.6000e-004**	**0.1238**	**0.0327**	**5.1000e-004**	**0.0332**		**96.7068**	**96.7068**	**2.5900e-003**	**2.6100e-003**	**97.5484**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2035	0.1280	1.6704	5.1400e-003	0.6818	3.0800e-003	0.6849	0.1809	2.8400e-003	0.1837		535.1111	535.1111	0.0143	0.0144	539.7676
Total	**0.2035**	**0.1280**	**1.6704**	**5.1400e-003**	**0.6818**	**3.0800e-003**	**0.6849**	**0.1809**	**2.8400e-003**	**0.1837**		**535.1111**	**535.1111**	**0.0143**	**0.0144**	**539.7676**

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2035	0.1280	1.6704	5.1400e-003	0.6818	3.0800e-003	0.6849	0.1809	2.8400e-003	0.1837		535.1111	535.1111	0.0143	0.0144	539.7676
Total	**0.2035**	**0.1280**	**1.6704**	**5.1400e-003**	**0.6818**	**3.0800e-003**	**0.6849**	**0.1809**	**2.8400e-003**	**0.1837**		**535.1111**	**535.1111**	**0.0143**	**0.0144**	**539.7676**

3.6 Architectural Coating - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1929	0.1165	1.5808	4.9800e-003	0.6818	2.9400e-003	0.6848	0.1809	2.7000e-003	0.1836		522.9535	522.9535	0.0131	0.0136	527.3429
Total	**0.1929**	**0.1165**	**1.5808**	**4.9800e-003**	**0.6818**	**2.9400e-003**	**0.6848**	**0.1809**	**2.7000e-003**	**0.1836**		**522.9535**	**522.9535**	**0.0131**	**0.0136**	**527.3429**

3.6 Architectural Coating - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1929	0.1165	1.5808	4.9800e-003	0.6818	2.9400e-003	0.6848	0.1809	2.7000e-003	0.1836		522.9535	522.9535	0.0131	0.0136	527.3429
Total	**0.1929**	**0.1165**	**1.5808**	**4.9800e-003**	**0.6818**	**2.9400e-003**	**0.6848**	**0.1809**	**2.7000e-003**	**0.1836**		**522.9535**	**522.9535**	**0.0131**	**0.0136**	**527.3429**

3.6 Architectural Coating - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1832	0.1069	1.5048	4.8400e-003	0.6818	2.7700e-003	0.6846	0.1809	2.5500e-003	0.1834		511.9270	511.9270	0.0120	0.0130	516.0926
Total	**0.1832**	**0.1069**	**1.5048**	**4.8400e-003**	**0.6818**	**2.7700e-003**	**0.6846**	**0.1809**	**2.5500e-003**	**0.1834**		**511.9270**	**511.9270**	**0.0120**	**0.0130**	**516.0926**

3.6 Architectural Coating - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	8.7758					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**8.9467**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1832	0.1069	1.5048	4.8400e-003	0.6818	2.7700e-003	0.6846	0.1809	2.5500e-003	0.1834		511.9270	511.9270	0.0120	0.0130	516.0926
Total	**0.1832**	**0.1069**	**1.5048**	**4.8400e-003**	**0.6818**	**2.7700e-003**	**0.6846**	**0.1809**	**2.5500e-003**	**0.1834**		**511.9270**	**511.9270**	**0.0120**	**0.0130**	**516.0926**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	0.00	0.00	0.00		
Other Asphalt Surfaces	0.00	0.00	0.00		
Regional Shopping Center	0.00	0.00	0.00		
Single Family Housing	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Congregate Care (Assisted	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Other Asphalt Surfaces	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Regional Shopping Center	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730
Single Family Housing	0.554639	0.059030	0.188043	0.120453	0.022437	0.005729	0.010970	0.007473	0.000973	0.000534	0.026133	0.000855	0.002730

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1556	1.3309	0.5768	8.4900e-003		0.1075	0.1075		0.1075	0.1075		1,697.1457	1,697.1457	0.0325	0.0311	1,707.2309
NaturalGas Unmitigated	0.1556	1.3309	0.5768	8.4900e-003		0.1075	0.1075		0.1075	0.1075		1,697.1457	1,697.1457	0.0325	0.0311	1,707.2309

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3444.53	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	256.438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	10724.8	0.1157	0.9884	0.4206	6.3100e-003		0.0799	0.0799		0.0799	0.0799		1,261.7381	1,261.7381	0.0242	0.0231	1,269.2360
Total		**0.1556**	**1.3309**	**0.5768**	**8.4900e-003**		**0.1075**	**0.1075**		**0.1075**	**0.1075**		**1,697.1457**	**1,697.1457**	**0.0325**	**0.0311**	**1,707.2309**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Congregate Care (Assisted Living)	3.44453	0.0372	0.3174	0.1351	2.0300e-003		0.0257	0.0257		0.0257	0.0257		405.2384	405.2384	7.7700e-003	7.4300e-003	407.6465
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.256438	2.7700e-003	0.0251	0.0211	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003		30.1692	30.1692	5.8000e-004	5.5000e-004	30.3485
Single Family Housing	10.7248	0.1157	0.9884	0.4206	6.3100e-003		0.0799	0.0799		0.0799	0.0799		1,261.7381	1,261.7381	0.0242	0.0231	1,269.2360
Total		**0.1556**	**1.3309**	**0.5768**	**8.4900e-003**		**0.1075**	**0.1075**		**0.1075**	**0.1075**		**1,697.1457**	**1,697.1457**	**0.0325**	**0.0311**	**1,707.2309**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	17.7237	1.0638	72.4070	0.1577		7.9535	7.9535		7.9535	7.9535	1,153.8781	44.1317	1,198.0098	5.4364	0.0000	1,333.9204
Unmitigated	17.7237	1.0638	72.4070	0.1577		7.9535	7.9535		7.9535	7.9535	1,153.8781	44.1317	1,198.0098	5.4364	0.0000	1,333.9204

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.7792					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	9.9321					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	5.2769	0.7818	47.9219	0.1564		7.8176	7.8176		7.8176	7.8176	1,153.8781	0.0000	1,153.8781	5.3942	0.0000	1,288.7318
Landscaping	0.7355	0.2820	24.4851	1.2900e-003		0.1359	0.1359		0.1359	0.1359		44.1317	44.1317	0.0423		45.1887
Total	**17.7237**	**1.0638**	**72.4070**	**0.1576**		**7.9535**	**7.9535**		**7.9535**	**7.9535**	**1,153.8781**	**44.1317**	**1,198.0098**	**5.4364**	**0.0000**	**1,333.9204**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.7792					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	9.9321					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	5.2769	0.7818	47.9219	0.1564		7.8176	7.8176		7.8176	7.8176	1,153.878 1	0.0000	1,153.878 1	5.3942	0.0000	1,288.731 8
Landscaping	0.7355	0.2820	24.4851	1.2900e-003		0.1359	0.1359		0.1359	0.1359		44.1317	44.1317	0.0423		45.1887
Total	**17.7237**	**1.0638**	**72.4070**	**0.1576**		**7.9535**	**7.9535**		**7.9535**	**7.9535**	**1,153.878 1**	**44.1317**	**1,198.009 8**	**5.4364**	**0.0000**	**1,333.920 4**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix F

Prepared by
FEHR & PEERS

100 Pringle Avenue
Suite 600
Walnut Creek, CA 94596

July 2022

Final

Transportation Impact Assessment

Albers Ranch

Prepared for:
The City of Antioch
Raney Planning and Management

Albers Ranch

Final

Transportation Impact Assessment

Prepared for:

The City of Antioch

Raney Planning and Management

July 2022

WC19-3641

FEHR & PEERS

Table of Contents

Appendices

List of Figures

List of Tables

Introduction

This report presents the analysis and findings of the Transportation Impact Assessment (TIA) prepared for the Albers Ranch (project) located in the City of Antioch, Contra Costa County. This chapter discusses the TIA's purpose, study locations and analysis scenarios, analysis methods, criteria used to identify significant impacts, and report organization.

Study Purpose

The study's purpose is to evaluate the potential transportation impacts of Albers Ranch, a residential living development on approximately 52.8 acres in the southeastern portion of the City of Antioch, as shown on **Figure 1.** The project site is located within the Sand Creek Focus Area and proposes to construct up to 300 single-family dwelling units and an Assisted Living Facility for seniors that would include approximately 150 beds. The project also proposes to construct approximately 40,000 square feet of neighborhood serving commercial land uses. The project's conceptual site plan is shown on **Figure 2a** and **Figure 2b**.

The project as currently proposed consists of the following elements:

- 300 single-family dwelling units
- An assisted living facility with 150 beds
- 40,000 square feet of neighborhood commercial development
- 2.1 acres of park and service amenities
- 43.7 acres of open space
- 13.2 acres of private streets and guest parking
- 3.3 acres of storm management area

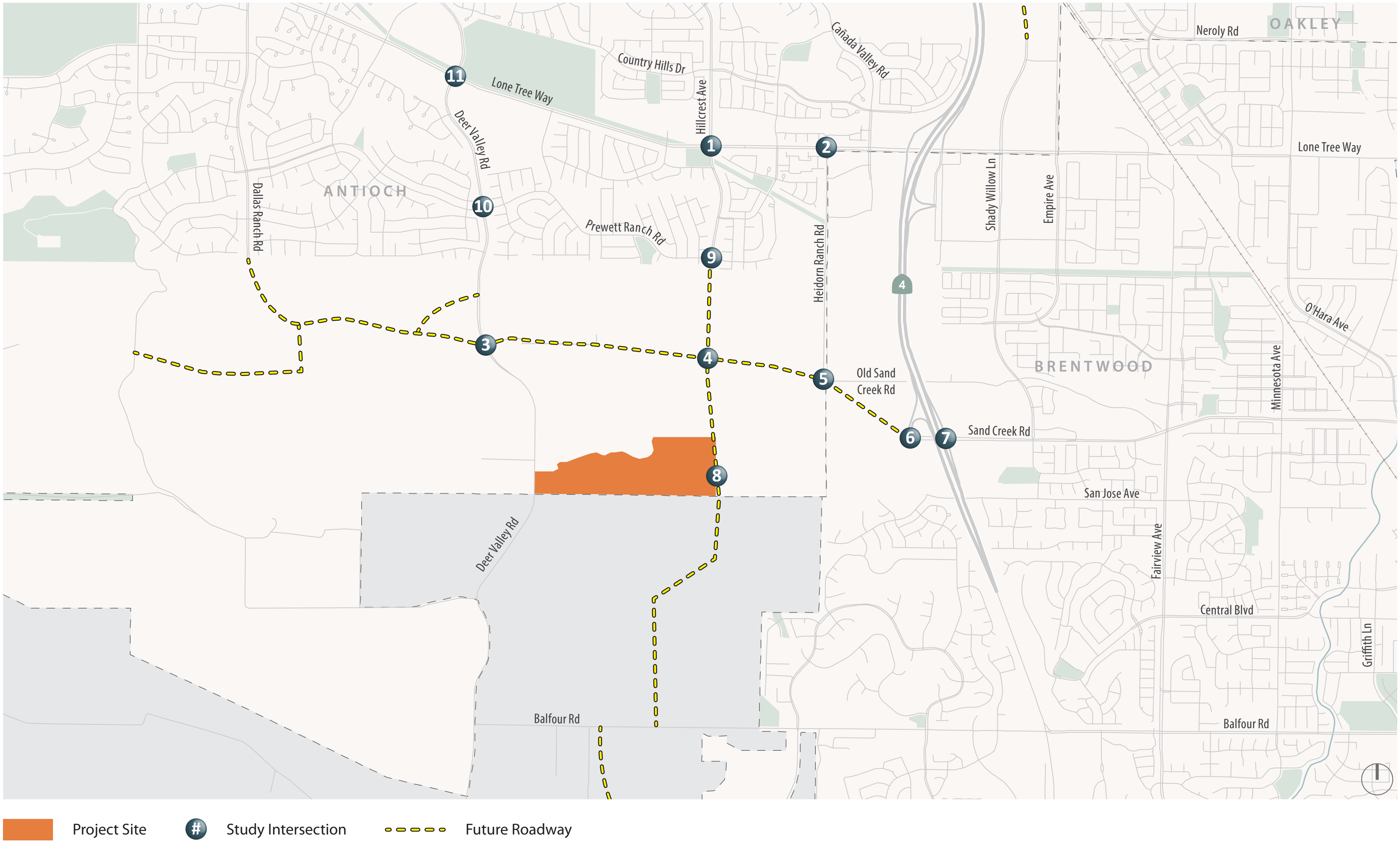
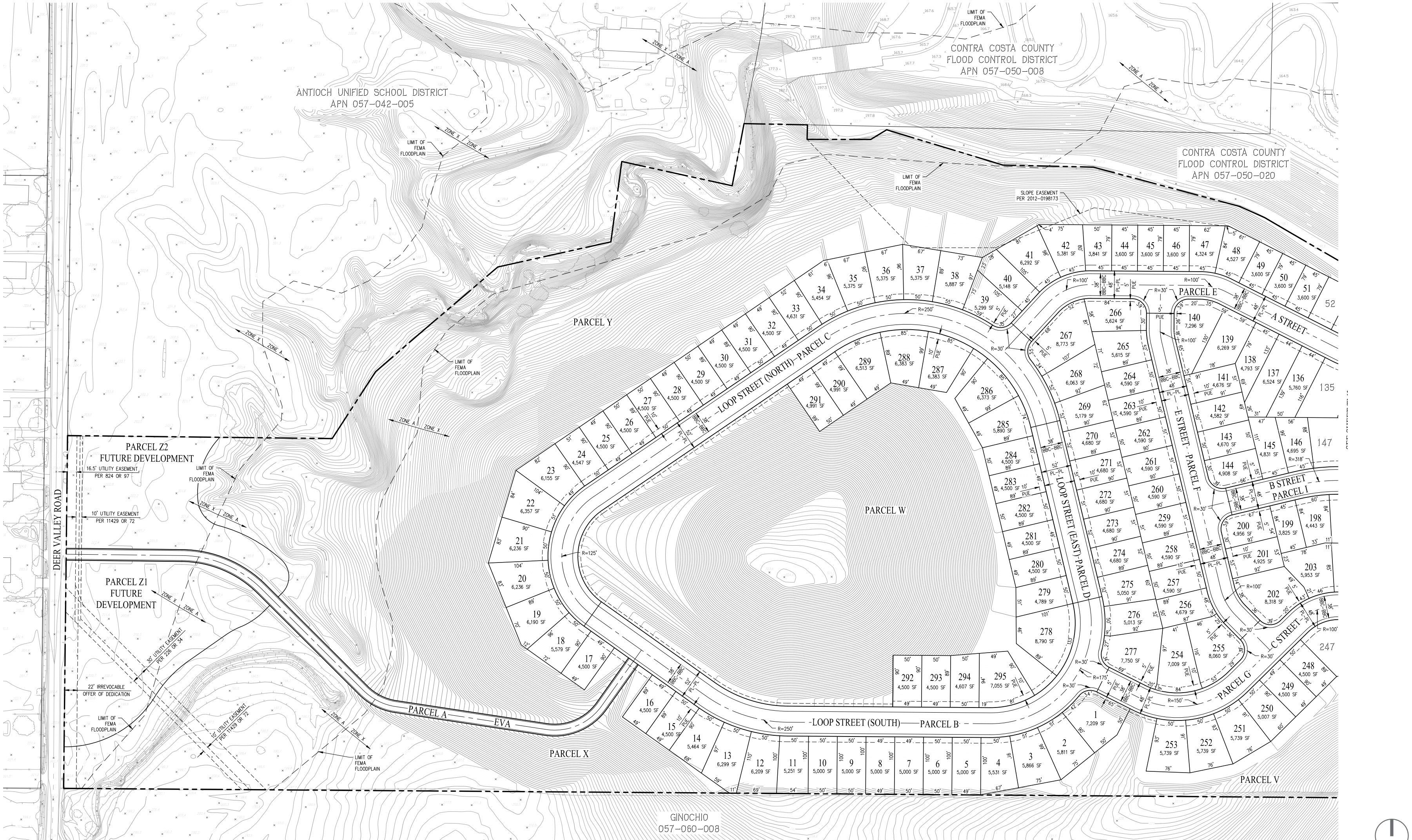


Figure 1

Site Vicinity Map and Study Intersection Locations

WC19-3641_1_StudyArea



Site Plan Source: Carlson, Barbee & Gisbon, Inc., May 23, 2019

Figure 2a

Conceptual Project Site Plan 1 of 2

Site Plan Source: Carlson, Barbee & Gisbon, Inc., May 23, 2019

Figure 2b

Conceptual Project Site Plan 2 of 2

Study Area

Potential project violations of the city's established level of service policies at study area roadway facilities were determined by measuring the effect project traffic would have on intersections in the vicinity of the project site during the weekday morning (6:00 to 9:00 AM) and afternoon (3:00 to 6:00 PM) peak periods. As shown on **Figure 1**, the following intersections were selected based on a review of the project location, estimates of the added traffic from the project, and locations of planned roadways in the area:

1. Lone Tree Way at Hillcrest Avenue
2. Lone Tree Way at Heidorn Ranch Road/Fairside Way
3. Sand Creek Road at Deer Valley Road
4. Sand Creek Road at Hillcrest Avenue (Future Intersection)
5. Sand Creek Road at Heidorn Ranch Road (Future Intersection)
6. Sand Creek Road at State Route 4 Eastbound Ramps
7. Sand Creek Road at State Route 4 Westbound Ramps
8. Hillcrest Avenue at Project Access (Future Intersection)
9. Hillcrest Avenue at Prewett Ranch Road
10. Deer Valley Road at Prewett Ranch Road
11. Deer Valley Road at Lone Tree Way

The following freeway segments were also included in the assessment:

1. State Route 4, between Laurel Road and Lone Tree Way
2. State Route 4, between Lone Tree Way and Sand Creek Road
3. State Route 4, between Sand Creek Road and Balfour Road
4. State Route 4, between Balfour Road and Marsh Creek Road

Study intersections and roadway segments were selected through an evaluation of the amount of traffic that the project would add to area transportation facilities. Locations at which the project may result in a violation of the applicable level of service policies were identified, based on monitoring and prior studies, were included in the assessment.

Analysis Scenarios

This section describes the different scenarios to be evaluated as part of the transportation analysis. The assumed roadway improvements associated with each scenario are listed in **Table 3**.

1. ***Existing*** – Based on traffic counts collected at the above intersections when area schools were in normal session.

2. ***Existing Plus Project*** – Existing traffic counts plus traffic generated by the proposed project. This scenario also assumes the development of the Promenade and Creekside neighborhoods of the Vineyards at Sand Creek project, as these projects would construct roadways that would provide access to the Albers Ranch Project site. Without construction of these two projects and associated roadway improvements, vehicular access to the Albers Ranch project site would not be provided. See **Table 1** for the level of development assumed in this scenario. The locations of the projects listed in the table are shown on **Figure 3**.

Table 1: Existing Plus Project Assumed Development

Map Location (City)	Project Name	Size	Land Use	Status
8 (Antioch)	Vineyard at Sand Creek (Promenade)	192 dwelling units 440 dwelling units	Unrestricted Single Family Homes Age Restricted Single Family Homes	Under Construction; not yet occupied
16 (Antioch)	Creekside Vineyards at Sand Creek	220 Dwelling Units	Single Family Homes	Under Review

Source:
1. Creekside (Vineyards at Sand Creek) Transportation Impact Assessment, Fehr & Peers, 2020.
2. The Ranch Transportation Impact Assessment, Fehr & Peers, 2019.
3. *City of Brentwood Project Status* as of March 2020 and City of Antioch Development Project Pipeline (March 2020).

3. ***Near-Term*** – Existing traffic counts plus traffic from approved and pending projects expected to be developed in the next 5 to 10 years. The near-term scenario includes traffic from approved projects in the vicinity of the study area that could result in changed travel patterns at the study intersections. The list of approved projects included in this assessment is provided in **Table 2**. The existing traffic counts were also increased by 1 percent per year for five years, consistent with regional growth trends predicted by the CCTA model, to account for traffic increases from projects not within the immediate study area. The locations of the near-term projects listed below are shown on **Figure 3**.

Table 2: Near-Term Approved Projects Summary

Map Location (City)	Project Name	Size	Land Use	Status
1 (Brentwood)	Bridle Gate Residential Elementary School Commercial	252 dwelling units 258 dwelling units 700 students 150,000 square-feet	Unrestricted Single Family Homes Apartments Elementary School Commercial	Pending; construction not yet started
2 (Brentwood)	Trilogy at the Vineyards Pioneer Square	1,600 units 72 units	Age-restricted Single Family Homes Age-restricted Attached Homes	Under Construction; 707 units remaining Under Construction; 72 units remaining
3 (Brentwood)	Contra Costa County Community College District	5,000 students	Community College	Under Construction; not yet occupied
4 (Brentwood)	Sciortino Ranch (9356)	326 units	Unrestricted Single Family Homes	Under Construction
5 (Brentwood)	Streets of Brentwood	320 dwelling units 32,000 square feet	Multi-family Units Shopping Center	Pending; construction not yet started
6 (Antioch)	Heidorn Village	117 dwelling units	Unrestricted Single Family Homes	Approved; Under Construction
7 (Antioch)	Aviano	533 dwelling units	Unrestricted Single Family Homes	Approved; Under Construction
8 (Antioch)	Vineyard at Sand Creek (Promenade)	192 dwelling units 440 dwelling units	Unrestricted Single Family Homes Age Restricted Single Family Homes	Under Construction; not yet occupied
9 (Antioch)	The Ranch	755 dwelling units 422 dwelling units 54,000 square feet	Unrestricted Homes Age Restricted Homes Commercial	Initiative adopted by Council; construction not yet started

10 (Antioch)	Laurel Ranch	180 dwelling units 10 acres commercial	Unrestricted Single Family Homes Commercial	Approved; construction not yet started
11 (Antioch)	Quail Cove	32 dwelling units	Unrestricted Single Family Homes	Approved; construction not yet started
12 (Antioch)	Park Ridge	525 dwelling units	Unrestricted Single Family Homes	Under Construction; 178 units remaining
13 (Brentwood)	Orfanos, Brentwood	160 dwelling units	Single Family Homes	Under Construction
14 (Brentwood)	Alvarez Partners, Brentwood	48 dwelling units	Single Family Homes	Approved
15 (Brentwood)	Shops at Lone Tree Village, Brentwood	54,000 square feet	Shopping Center	Under Construction
16 (Antioch)	Creekside Vineyards at Sand Creek	220 Dwelling Units	Single Family Homes	Under Review

Source: *City of Brentwood Project Status* as of March 2020 and City of Antioch Development Project Pipeline (March 2020).

4. ***Near-Term Plus Project*** – Near-term conditions plus traffic expected to be generated by the proposed project.

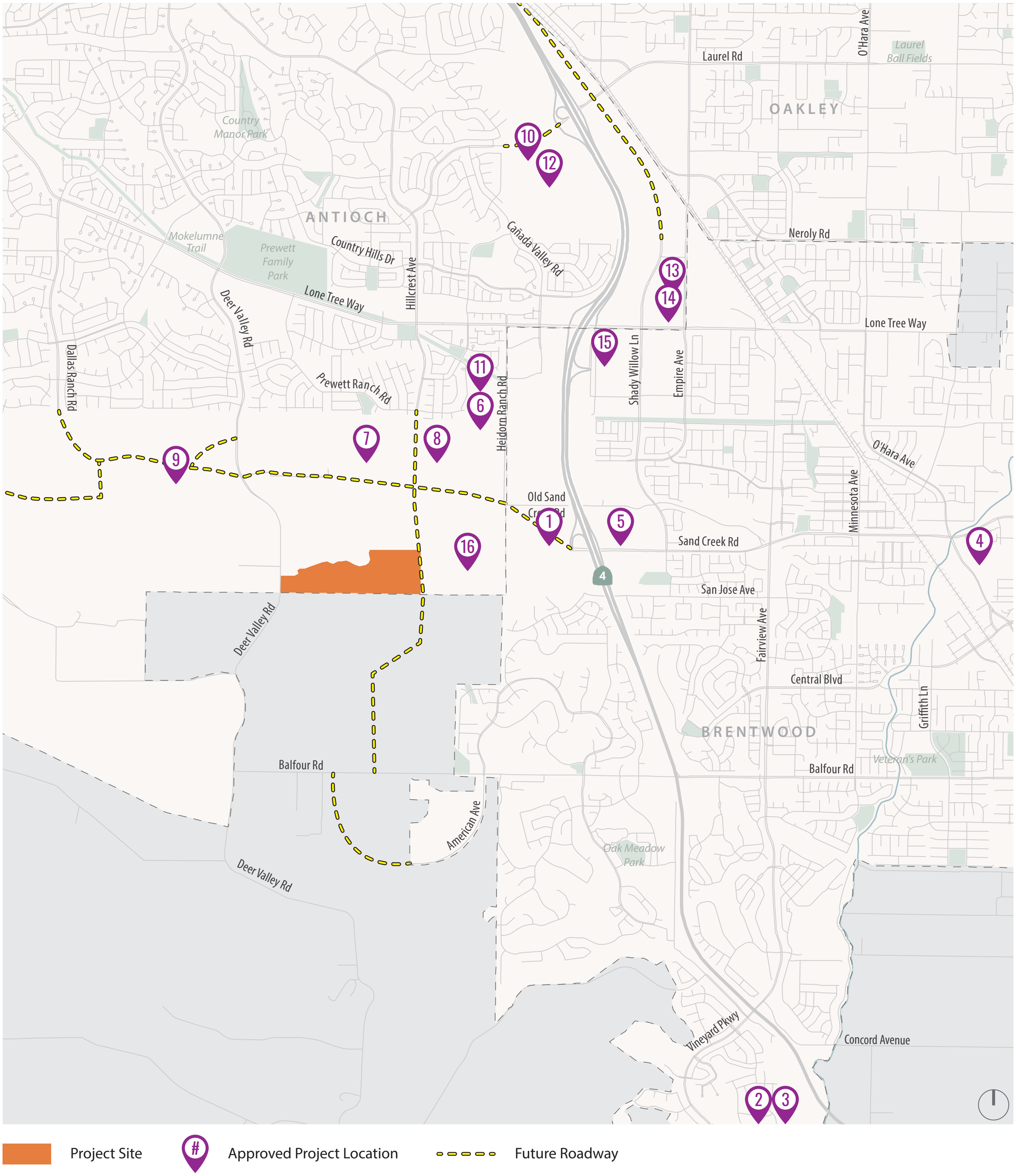
5. ***Cumulative*** – Forecasts for the cumulative scenario are based on traffic growth trends as described in the Antioch and Brentwood General Plan EIRs and supplemented by a check of traffic forecasts for the study area in the 2040 Contra Costa Countywide travel demand model. Vehicle trips generated under the project site current zoning were subtracted from the base forecasts to develop the "no project" traffic forecasts.

6. ***Cumulative Plus Project*** – Cumulative forecasts plus traffic expected to be generated by the proposed project.

Table 3: Analysis Scenarios and Assumed Roadway Improvements

Analysis Scenario	Roadway Improvements	Associated Project/ Development
Existing Plus Project	Hillcrest Avenue extension from its current terminus at Prewett Ranch Drive to the southern extents of the Creekside project	Vineyards at Sand Creek (Promenade), Vineyards at Sand Creek (Creekside)
Near-Term	Construction of Sand Creek Road between Heidorn Ranch Road and its current terminus west of State Route 4 bypass	Bridle Gate
	Construction of Sand Creek Road between Hillcrest Avenue and Heidorn Ranch Road	Vineyards at Sand Creek
	Construction of Sand Creek Road from Hillcrest Avenue to east of Libbey Dozier High School	Aviano
	Construction of Sand Creek Road between Deer Valley Road and Dallas Ranch Road	The Ranch
	Improvements to Heidorn Ranch Road	Vineyards at Sand Creek (Promenade), Heidorn Village
	Extension of Laurel Road from State Route 4 to its current terminus east of Canada Valley Road	-
	Extension of Prewett Ranch Drive to Heidorn Ranch Road	Heidorn Village
Cumulative	Extension of Hillcrest Avenue from the southern Creekside project terminus to Balfour Road as a gated private roadway	Vineyards at Deer Creek
	Construction of Sand Creek Road between the Kaiser Medical Center and Deer Valley Road	-
	Widening of Heidorn Ranch Road to four lanes from south of Lone Tree Plaza Drive to Sand Creek Road	Vineyards at Sand Creek (Promenade)/Priority Area One Development
	Widening of State Route 4 to provide two travel lanes in each direction from south of Balfour Road to Marsh Creek Road	CCTA
	Improvements to the Lone Tree Way at Heidorn Ranch Road intersection conditioned on development in Brentwood as part of Priority Area One	Priority Area One Development
	Extension of Slatten Ranch Road to Laurel Road	-

Sources:
1. Creekside (Vineyards at Sand Creek) Transportation Impact Assessment, Fehr & Peers, 2020.
2. The Ranch Transportation Impact Assessment, Fehr & Peers, 2019.



WC19-3641_3_ApprovedProj

Figure 3

Approved Project Locations

Analysis Methods

Vehicle Miles of Travel

"VMT" or Vehicle Miles of Travel is a measure used to describe automobile use on a daily basis. VMT is the product of the total number of vehicles traveling and the number of miles traveled per vehicle. In December 2018, the Governor's Office of Planning and Research (OPR) finalized new CEQA guidelines (CEQA Guidelines section 15064.3) that identify VMT as the most appropriate criterium to evaluate a project's transportation impacts.

The implementation of Senate Bill (SB) 743 eliminated the use of criteria such as auto delay, level of service, and similar measures of vehicle capacity of traffic congestion as the basis for determining significant impacts as part of CEQA compliance. The SB 743 VMT criteria promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. In compliance with SB 743 mandates, VMT was employed to assess the impacts of this project on the transportation network.

Level of Service

The operations of roadway facilities are described with the term "level of service" (LOS). LOS is a qualitative description of traffic flow from a vehicle driver's perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (free-flow conditions) to LOS F (over capacity conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result, and operations are designated LOS F.

Signalized Intersections

Traffic conditions at signalized intersections were evaluated using methods developed by the Transportation Research Board (TRB), as documented in the *Highway Capacity Manual 6th Edition* (HCM 6th) for vehicles. The HCM method calculates control delay at an intersection based on inputs such as traffic volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors. Control delay is defined as the delay directly associated with the traffic control device (i.e., a stop sign or a traffic signal) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The relationship between LOS and control delay is summarized in **Table 4**.

Unsignalized Intersections

For unsignalized (all-way stop controlled and side-street stop controlled) intersections, the HCM 6th method for unsignalized intersections was used. With this method, operations are defined by the average control delay per vehicle (measured in seconds). The control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 5** summarizes the relationship between LOS and delay for unsignalized intersections. At side-street stop-controlled intersections, the delay is calculated for each stop-controlled movement, the left turn movement from the major street, as well as the intersection average. The intersection average delay and highest movement/approach delay are reported for side-street stop-controlled intersections.

Freeway Segments

For freeway segments, the *East County Action Plan for Routes of Regional Significance,* CCTA has established the delay index as the Multimodal Transportation Service Objective (MTSO) for State Route 4 (SR 4) through the study area. The delay index is the ratio of travel time on a facility divided by the travel times that occur during non-congested free-flow periods. Should the delay index exceed 2.5 during either the AM or PM peak period, freeway operations would be considered deficient. This would equate to peak hour travel taking 2.5 times as long as off-peak travel or an average travel speed below 26 miles per hour assuming a non-congested free-flow speed of 65 miles per hour. The number of vehicles traveling in the high-occupancy vehicle (HOV) lane is also an MTSO.

For the Caltrans freeway facilities, the operational standards and significance criteria are established by the Contra Costa Transportation Authority (CCTA) acting as the designated Congestion Management Agency (CMA) representing the jurisdictions of Contra Costa County. As the acting CMA, the CCTA establishes the traffic LOS standards for all state highway facilities in Contra Costa County, which supersede the general Caltrans operational standard for all state highways.[1]

[1] *2013 Contra Costa Congestion Management Plan*, Contra Costa Transportation Authority, Walnut Creek, CA, 94598, December 19, 2013.

Table 4: Signalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0

Source: *Highway Capacity Manual 6th Edition (Transportation Research Board).*

Table 5: Unsignalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Little or no delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic, delays where intersection capacity exceeded	> 50.0

Source: *Highway Capacity Manual 6th Edition (Transportation Research Board).*

Significance Criteria – Environmental Impacts

Thresholds of Significance for VMT

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) updated the California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. Draft guidelines were developed in August 2014, with final guidelines published in November 2017 incorporating public comments from the August 2014 and January 2016 guidelines. In December 2018, the California Natural Resources Agency certified and adopted the CEQA Guidelines update package along with an updated Technical Advisory related to Evaluating Transportation Impacts in CEQA (December 2018). Full compliance with the guidelines is now required, and vehicle-delay based level of service calculations cannot be used to evaluate the environmental impacts of projects on the transportation system.

On July 15, 2020, the Contra Costa Transportation Authority (CCTA) adopted criteria, standards, and thresholds for the assessment of VMT (CCTA, *Approval of the Vehicle Miles Traveled Analysis Methodology for Land Use Projects in the Growth Management Program*, July 15, 2020). The methods and thresholds adopted by CCTA follow the guidance and recommendations of OPR pertaining to the implementation of SB 743.

As the City of Antioch has not yet formally adopted VMT criteria, standards, or thresholds at the time this report was prepared, this assessment follows the current OPR and CCTA guidance related to VMT, as described below:

- Residential Projects should use the home-based VMT per capita metric to evaluate their project generated VMT. The project generated home-based VMT per resident constitutes a significant impact if it is higher than 85% of the home-based VMT per resident in the subject municipality or unincorporated Authority subregion (for areas outside of municipalities) or 85% of the existing county-wide average home-based VMT per resident, whichever is less stringent.
- Employment-Generating Projects should use the home-work VMT per worker metric for their project generated VMT estimates. The project generated home-work WMT per worker constitutes a significant impact if it is higher than 85% of the home-work VMT per worker in the subject municipality or unincorporated Authority subregion (for areas outside of municipalities) or 85% of the existing Bay Area region-wide average home-work VMT per worker, whichever is less stringent.
- Other Uses and Projects need to be analyzed using a methodology developed by the lead agency specifically for the project, taking into account the specific methodologies and thresholds identified in *Approval of the Vehicle Miles Traveled Analysis Methodology for Land Use Projects in the Growth Management Program,* CCTA, July 15, 2020.
- Mixed-Use Projects may be analyzed using a combination of techniques.

CCTA guidance defines the following criteria that lead agencies can apply to screen projects out of conducting project-level VMT analysis:

- CEQA Exemption – Any project that is exempt from CEQA is not required to conduct a VMT analysis.
- Small projects – Small projects can be presumed to cause a less-than-significant VMT impact. Small projects are defined as having 10,000 square feet or less of non-residential space or 20 residential units or less, or otherwise generating less than 836 VMT per day.
- Local-Serving Uses – Projects that consist of Local-Serving Uses can generally be presumed to have a less-than-significant impact absent substantial evidence to the contrary, since these types of projects will primarily draw users and customers from a relatively small geographic area that will lead to short-distance trips and trips that are linked to other destinations.
- Projects Located in Transit Priority Areas (TPAs) – Projects located within a TPA can be presumed to have a less-than-significant impact absent substantial evidence to the contrary.
- Projects located in Low VMT Areas – residential and employment-generating projects located within a low VMT-generating area can be presumed to have a less-than-significant impact absent substantial evidence to the contrary. A Low VMT area is defined as follows:
    - For housing projects: Cities, towns and unincorporated portions within Contra Costa that have existing home-based VMT per capita that is 85% or less of the existing county-wide average.
    - For employment-generating projects: Cities, towns, and unincorporated portions within Contra Costa that have existing home-work VMT per worker that is 85% or less of the existing regional average.

Additional CEQA Thresholds

The following thresholds of significance were developed based on City of Antioch and East Contra Costa County Action Plan policies, as well as the CEQA Checklist criteria.

Would the project:

A. Conflict with a program, plan, ordinance or policy addressing the circulation system, including roadway, transit, bicycle and pedestrian facilities?

   Transit System - The project would create a significant impact related to transit service if the following criteria is met:

   1. The project interferes with existing transit facilities or precludes the construction of planned transit facilities.

Bicycle System - The project would create a significant impact related to the bicycle system if any of the following criteria are met:

1. Disrupt existing bicycle facilities; or
2. Interfere with planned bicycle facilities; or
3. Create inconsistencies with adopted bicycle system plans, guidelines, policies, or standards.

Pedestrian System - The project would create a significant impact related to the pedestrian system if any of the following criteria are met:

1. Disrupt existing pedestrian facilities; or
2. Interfere with planned pedestrian facilities; or
3. Create inconsistencies with adopted pedestrian system plans, guidelines, policies, or standards.

B. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)[2]?

C. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

D. Result in inadequate emergency access?

Non-CEQA Evaluation Criteria

Although not a CEQA metric, intersection levels of service were evaluated in this study for General Plan compliance and to identify potential transportation improvements that could be implemented as part of the project to improve the overall operations of the transportation system for all travel modes. The City of Antioch generally strives to maintain level of service D operations for signalized intersections, unless other standards are adopted by CCTA or other regional agency.

The project could have a noticeable effect on local and regional travel if it would cause an increase in traffic which is substantial in relation to the traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, or delay and congestion at intersections), or change the condition of an existing street (e.g., street closures, changing direction of travel) in a manner that would substantially change access or traffic load and capacity of the street system.

[2] This section of the CEQA Guidelines relates to the evaluation of vehicle miles of travel (VMT).

Recommendations will be designed to enhance mobility for all travel modes, including transit vehicles, without degrading or precluding the provision of planned bicycle, pedestrian, and transit facilities. Intersection or roadway improvements may be recommended under the following circumstances:

A. Would the operations of a study intersection on a route of regional significance decline from LOS high-D (an average delay of 55 seconds for signalized intersections) or better to LOS E or F, based on the HCM LOS method, with the addition of Project traffic[3]?

B. Would the operations of a study intersection not on a route of regional significance decline from the established performance standard for the roadway facility type?

   - LOS Low-E (an average delay of 65 seconds for signalized intersections) or better to a high-LOS E or F, based on the HCM LOS method, with the addition of Project traffic for intersections within 1,000 feet of a freeway interchange? [4]
   - LOS high-D (an average delay of 55 seconds for signalized intersections) or better to a LOS E or F, based on the HCM LOS method, with the addition of Project traffic for residential and commercial portions of the Rivertown Focus Area[5]?
   - LOS mid-D (an average delay of 50 seconds for signalized intersections) or better to a high-LOS D, LOS E or F, based on the HCM LOS method, with the addition of Project traffic for residential and arterial roadways in non-regional commercial areas[6]?

C. Would the Project deteriorate already unacceptable operations at a signalized intersection by adding traffic?

D. Would the operations of an unsignalized study intersection decline from acceptable to unacceptable with the addition of Project traffic, <u>and</u> would the installation of a traffic signal based on the *Manual on Uniform Traffic Control Devices* (MUTCD) Peak Hour Signal Warrant (Warrant 3), be warranted?

E. Would the Project result in or worsen unacceptable conditions on the State Route 4 mainline, based on delay index calculations?

   - The delay index should not exceed 2.5 during the AM or PM peak hour, meaning that congested travel times should not be more than 2.5 times the uncongested travel times.

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[3] Per the East County Action Plan, study intersections 1-7 and 10-11 are on a designated Route of Regional Significance.
[4] No study intersections are within this area.
[5] No study intersections are within this area.
[6] Study intersections 8-9 are on a designated residential or arterial roadway in non-regional commercial areas.

Report Organization

This report is divided into nine chapters as described below:

- **Chapter 1 – Introduction** discusses the purpose and organization of the report.
- **Chapter 2 – Existing Conditions** describes the transportation system in the project vicinity, including the surrounding roadway network, morning and evening peak hour intersection turning movement volumes, existing bicycle, pedestrian, and transit facilities, and intersection operations.
- **Chapter 3 – Project Characteristics** presents relevant project information, such as the project components and project trip generation, distribution, and assignment.
- **Chapter 4 – Existing with Project Traffic Conditions** addresses the existing conditions with the project and discusses project vehicular impacts.
- **Chapter 5 – Near-Term Traffic Conditions** addresses the near-term future conditions, both without and with the project, and discusses project vehicular impacts.
- **Chapter 6 – Cumulative Traffic Conditions** addresses the long-term future conditions, both without and with the project, and discusses project vehicular impacts.
- **Chapter 7 - Environmental Assessment** discusses the project's potential impacts regarding transportation related environmental topics, including Vehicle Miles Traveled, Pedestrian Facilities, Bicycle Facilities, Transit Facilities and Emergency Vehicle Access.
- **Chapter 8 – Site Plan Review** discusses the operations and review of the project's proposed site plan, including an assessment of the adequacy of the proposed parking supply.
- **Chapter 9 – Summary of Findings** provides a summary of the report's findings and recommendations.

Existing Conditions

This chapter describes transportation facilities in the study area, including the surrounding roadway network, transit, pedestrian, and bicycle facilities in the project site vicinity. Existing intersection and freeway segment operations are also described.

Roadway System

The project site is bound by Contra Costa County Flood Control District and Antioch Unified School District to the north, medium density single family homes to the east, open space to the south, and Deer Valley Road to the west. Antioch is in eastern Contra Costa County, adjacent to the cities of Oakley and Brentwood, located east and southeast, respectively. Land uses surrounding the project site are office, residential, or undeveloped.

Regional access to the site is provided by State Route 4, Deer Valley Road and, once extended, Sand Creek Road and Hillcrest Avenue. The following discusses the roadways that would provide access to the site and are most likely to experience direct traffic effects, if any, from the proposed project.

State Route 4 (SR 4) is an east-west freeway that extends from Hercules in the west to Stockton and beyond in the east. In the study area, SR 4 has an east/west orientation from west of SR 160 and a northwest/ southeast orientation between SR 160 and Walnut Boulevard in eastern Contra Costa County. The facility is an eight-lane freeway in the west to State Route 160, a six-lane freeway from Route 160 to Laurel Road and a four-lane freeway from Laurel Road to Balfour Road. At Balfour Road, it transitions to a two-lane highway with at-grade intersections at Marsh Creek Road, and beyond. Each ramp-terminal intersection is signalized and operated by the California Department of Transportation (Caltrans). State Route 4 is a designated route of regional significance by the Contra Costa County Transportation Agency (CCTA). Routes of regional significance are roadways that connect two or more subareas of Contra Costa, cross county boundaries, carry significant through traffic, and/or provide access to a regional highway or transit facility.

Deer Valley Road is a north-south roadway connecting Brentwood to Antioch. From Balfour Road north to the Sand Creek Focus Area, it is two-lane rural road with adjacent areas mostly undeveloped and agricultural ranchettes. Along the rural section there are no bicycle or pedestrian facilities, or paved shoulders. North of Sand Creek Road at Kaiser Medical Center, Deer Valley Road has been improved to provide two-travel lanes in the northbound direction, sidewalks, and Class II bicycle facilities on the east side of the roadway; a shoulder has been added to the southbound travel lane. At Mammoth Way, Deer Valley Road provides two travel lanes in each direction, Class II bicycle lanes and sidewalks. North of Sand

Creek Road, a center median allows for the provision of left-turn pockets at intersections. Deer Valley has a posted speed limit of 45 miles per hour and is a designated route of regional significance.

Sand Creek Road is a four-lane, east-west roadway that extends east from State Route 4 through Brentwood. The posted speed limit is 45 mph. No on-street parking is permitted on Sand Creek Road. Class II bicycle lanes and sidewalks are provided along most of the roadway through Brentwood. Sand Creek Road from Brentwood Boulevard to its current terminus at State Route 4 is a route of regional significance. When constructed, the future extension of Sand Creek Road to Deer Valley Road would also be a designated route of regional significance.

Hillcrest Avenue is a four-lane, north-south roadway from north of Prewett Ranch Drive in the project study area. The posted speed limit is 45 mph. The Hillcrest Avenue provides a connection of the project area to SR 4. Sidewalks and bicycle facilities are provided along the full length of Hillcrest Avenue from north of Prewett Ranch Drive. Hillcrest Avenue, north of Lone Tree Way is a designated route of regional significance.

Existing Pedestrian and Bicycle Facilities

Pedestrian facilities in the study area include sidewalks, crosswalks, pedestrian signals, and multi-use trails. Many of the recently constructed roadways in the study area generally provide sidewalks on both sides of the street. Notable exceptions are Deer Valley Road south of Sand Creek Road and Balfour Road west of American Avenue which do not currently provide sidewalks.

No sidewalks or other transportation infrastructure currently exist on site but would be constructed with the project. At the signalized intersections in the area, crosswalks and pedestrian push-button actuated signals are generally provided.

Bicycle facilities include the following:

- **Bike paths (Class I)** – Paved trails that are separated from roadways. These trails are sometimes shared with pedestrians.
- **Bike lanes (Class II)** – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs.
- **Bike routes (Class III)** – Roadways designated for bicycle use by signs only; may or may not include additional pavement width for cyclists.
- **Separated Bikeway (Class IV)** – Separated bikeways, also referred to as cycle tracks or protected bikeways, are bikeways for the exclusive use of bicycles which are physically separated from vehicle traffic. Separated Bikeways were adopted by Caltrans in 2015. Types of separation may include, but are not limited to, grade separation, flexible posts, physical barriers, or on-street parking.

In the immediate project vicinity, portions of Deer Valley Road and Dallas Ranch Road provide Class II bicycle facilities with separate lanes designated for bicycle travel. Lone Tree Way from East Tregallas Road to the eastern Lone Tree Way/State Route 4 interchange provides Class II or Class III bicycle facilities, with Class III accommodations (pavement marking only, shared with vehicle travel lane) being the predominant bicycle facility. The Class I Mokelumne Trail is located north of the project site, with a grade separated crossing proposed at State Route 4, connecting to the existing trail section in Brentwood. The Mokelumne Trail ultimately connects to the Pittsburg/Bay Point BART Station. There are numerous existing Class I trails in the existing Dallas Rand Ranch and Prewett Ranch neighborhoods connecting residential neighborhoods to parks and schools.

Existing Transit Service

The Eastern Contra Costa Transit Authority (Tri Delta Transit) provides transit service in eastern Contra Costa County, serving the communities of Brentwood, Antioch, Oakley, Concord, Discovery Bay, Bay Point and Pittsburg. Three routes operate in the vicinity of the project site, with Routes 379, 388, and 392 stopping at the Kaiser Medical Center on Deer Valley Road, just northwest of the project site. Route 388 also has stops on Dallas Ranch Road and Prewett Ranch Road.

Route 388 operates weekdays between 5:30 AM and 11:30 PM on one-hour headways, connecting the Pittsburg/Bay Point BART station and Kaiser Medical Center, while also serving the Sutter Delta Medical Center, Downtown Antioch, Antioch BART, Pittsburg Center BART, the Pittsburg Civic Center, and numerous schools. In the study area, Route 388 operates on Dallas Ranch Road, Prewett Ranch Drive and Deer Valley Road. Route 392 provides weekend service to the same general destinations as Route 388 on one-hour headways between 7:25 AM and 1:44 AM.

Route 379 provides weekday service with one morning (7:05 AM) bus from the Antioch BART station to Kaiser Medical Center, and one afternoon bus (3:05 PM) from the Kaiser Medical Center to Antioch BART.

In addition to the regular transit service to the study area, dial-a-ride door-to-door service within Eastern Contra Costa County is provided by Tri Delta Transit for disabled people of all ages and senior citizens. A microtransit pilot program (Tri MyRide) was launched in June 2019 to provide on-demand rideshare service within specific boundaries connecting riders to key destinations, include the Antioch BART station and key shopping destinations. The service area boundaries are Highway 4, Long Tree Way, and Deer Valley Road. Rides cost $2. If successful, the program could be expanded.

Bay Area Rapid Transit (BART) provides fixed rail transit to Eastern Contra Costa County. The terminus station is located in Antioch at Hillcrest Avenue, approximately four miles from the project site with timed transfers from traditional BART transit to clean diesel BART trains at the Pittsburg/Bay Point BART station.

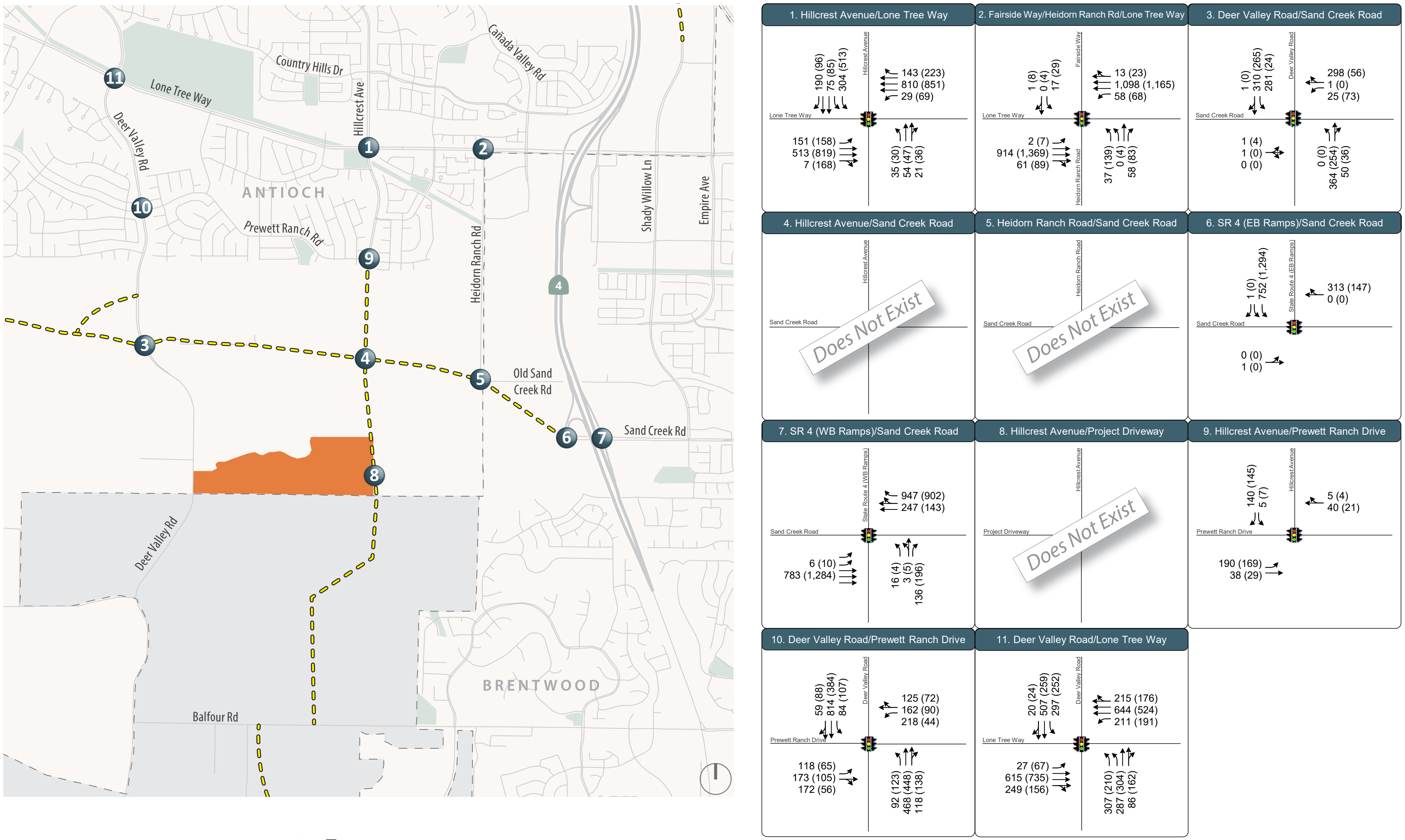
Weekday service is provided on approximately 15-minute headways and weekend service is provided on approximately 20-minute headways. The Antioch Line connects to key regional employment centers, including Concord, Pleasant Hill, Walnut Creek, Oakland, and San Francisco. Transfers to other lines can be made in Oakland.

Existing Traffic Counts

Weekday morning (6:00 to 9:00 AM) and evening (4:00 to 7:00 PM) peak period intersection turning movement counts were collected at the study intersections listed below, including separate counts of pedestrians, bicyclists, and heavy vehicles. Traffic counts at the italicized intersections were collected in January, May, and August 2019 with area schools in normal session (prior to the onset of the Covid-19 pandemic). At non-italicized intersections, traffic count data from 2017 was incorporated. Prior to the use of this data, counts from 2017 and 2019 at italicized intersections were compared and found to be similar. Nevertheless, the 2017 data was increased by two percent to reflect that some traffic changes may have occurred, consistent with historic growth rates in the area.

1. *Lone Tree Way at Hillcrest Avenue*
2. *Lone Tree Way at Heidorn Ranch Road/Fairside Way*
3. *Sand Creek Road at Deer Valley Road*
4. *Sand Creek Road at Hillcrest Avenue (Future Intersection)*
5. *Sand Creek Road at Heidorn Ranch Road (Future Intersection)*
6. *Sand Creek Road at State Route 4 Eastbound Ramps*
7. *Sand Creek Road at State Route 4 Westbound Ramps*
8. *Hillcrest Avenue at Project Access (Future Intersection)*
9. *Hillcrest Avenue at Prewett Ranch Road*
10. Deer Valley Road at Prewett Ranch Road
11. *Deer Valley Road at Lone Tree Way*

Peak hour intersection vehicle volumes are summarized on **Figure 4** along with existing lane configurations and traffic controls. The traffic counts for existing conditions are provided in **Appendix A**.



XX (YY) AM (PM) Peak Hour Traffic Volumes — Signalized Intersection

Project Site — # Study Intersection — Future Roadway

Figure 4

Existing Peak Hour

Intersection Traffic Volumes, Lane Configurations and Traffic Control

WC19-3641_X_Volumes

Existing Operations Assessment

Intersection Operations

Existing operations were evaluated using the methods described in Chapter 1 for the weekday AM and PM peak hours at the study intersections. The results of this assessment are summarized in **Table 6**. The analysis was based on the volumes, lane configurations, and traffic control presented on **Figure 4**. Observed peak hour factors[7] were used at all intersections for the existing analysis. Pedestrian and bicycle activity was also factored into the analysis. Detailed intersection LOS calculation worksheets are presented in **Appendix B**. As shown, all signalized and unsignalized study intersections currently operate within the overall level of service standards set by the City of Antioch and CCTA.

[7] The peak hour factor is the relationship between the peak 15-minute flow rate and the full hourly volume: PHF = Hourly volume / (4 x (volume during the peak 15 minutes of flow)). The analysis level of served is based on peak rates of flow occurring within the peak hour because substantial short term fluctuations typically occurring during an hour.

Table 6: Existing Conditions Peak Hour Intersection LOS Summary

	Intersection	Control[1]	Peak Hour	Delay[2, 3]	LOS
1	Lone Tree Way/Hillcrest Avenue	Signal	AM PM	18 21	B C
2	Lone Tree Way/Heidorn Ranch Road & Fairside Way	Signal	AM PM	11 12	B B
3	Sand Creek Road/Deer Valley Road	Signal	AM PM	10 6	A A
4	Sand Creek Road/Hillcrest Avenue *(Future Intersection)*	Signal	AM PM	- -	- -
5	Sand Creek Road/Heidorn Ranch Road *(Future Intersection)*	Signal	AM PM	- -	- -
6	Sand Creek Road/State Route 4 Eastbound Ramps	Signal	AM PM	9 8	A A
7	Sand Creek Road/State Route 4 Westbound Ramps	Signal	AM PM	5 5	A A
8	Hillcrest Avenue/Project Access *(Future Intersection)*	SSSC	AM PM	- -	- -
9	Hillcrest Avenue/Prewett Ranch Road	Signal	AM PM	19 17	B B
10	Deer Valley Road/Prewett Ranch Road	Signal	AM PM	27 14	C B
11	Deer Valley Road/Lone Tree Way	Signal	AM PM	30 21	C C

Notes:
1. Signal = Signalized intersection; SSSC = Side-street stop-controlled intersections; traffic on the main street does not stop while traffic on the side-street is controlled by a stop sign.
2. Average intersection delay is calculated for all signalized intersections using the HCM 6th method for vehicles.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.
Source: Fehr & Peers, 2022.

Freeway Segment Operations

Mainline traffic counts were conducted on State Route 4 south of Balfour Road in January 2019. Traffic volumes at the interchanges along the corridor were then used to estimate traffic volumes on the mainline segments from south of Balfour Road to north of Lone Tree Way. The traffic volumes and number of travel lanes were used to calculate vehicle speeds using the HCM 2010 method, which were then used to calculate the delay index. The results were verified through travel time runs of the corridor during peak hours.

The results are presented in **Table 7** for the AM Peak Hour and **Table 8** for the PM peak hour. State Route 4 north of Sand Creek Road operates at free-flow speeds during both the morning and evening peak hours.

With the recent widening of State Route 4 between Balfour Road and Sand Creek Road, and construction of an interchange, all mainline study freeway segments operate within the established service objective.

Table 7: Existing Conditions Freeway Operations Summary – AM Peak Hour

	Segment	Direction	Volume	Delay Index
1	State Route 4, north of Lone Tree Way	NB SB	2,787 2,887	1.01 1.01
2	State Route 4, north of Sand Creek Road	NB SB	2,488 2,815	1.00 1.01
3	State Route 4, north of Balfour Road	NB SB	2,009 2,014	1.00 1.00
4	State Route 4, south of Balfour Road	NB SB	1,201 940	1.20 1.03

Source: Fehr & Peers, 2022.

Table 8: Existing Conditions Freeway Operations Summary – PM Peak Hour

	Segment	Direction	Volume	Delay Index
1	State Route 4, north of Lone Tree Way	NB SB	3,711 2,975	1.11 1.02
2	State Route 4, north of Sand Creek Road	NB SB	3,185 2,932	1.03 1.02
3	State Route 4, north of Balfour Road	NB SB	2,038 2,220	1.00 1.00
4	State Route 4, south of Balfour Road	NB SB	1,015 1,431	1.05 1.82

Source: Fehr & Peers, 2022.

Project Characteristics

This chapter provides an overview of the proposed project components and addresses the proposed project trip generation, distribution, and assignment characteristics, allowing for an evaluation of project effects on the surrounding roadway network. The amount of traffic associated with the project was estimated using a three-step process:

1. **Trip Generation** – The *amount* of vehicle traffic entering/exiting the project site was estimated.
2. **Trip Distribution** – The *direction* trips would use to approach and depart the site was projected.
3. **Trip Assignment** – Trips were then *assigned* to specific roadway segments and intersection turning movements.

Project Description

The project site is located in the southeastern portion of the City of Antioch, within the Sand Creek Focus Area, bound on the west by Deer Valley Road, on the east by a future southern extension of Hillcrest Avenue and a portion of the proposed Creekside at Sand Creek development, and on the north and south by undeveloped land. The proposed project would construct 300 single-family dwelling units and develop an Assisted Living Facility for seniors that would include approximately 150 beds, as well as 40,000 square feet of neighborhood commercial land uses. The project site plan is shown on **Figures 2a** and **2b.**

The proposed vehicular access to the residential portion of the development is from a future southern extension of Hillcrest Avenue that would be constructed as part of the proposed Creekside at Sand Creek development. Access to the assisted living facility is proposed via a driveway on Deer Valley Road. An emergency vehicle access route is proposed from the assisted living facility on Deer Valley Road to the Albers Ranch community.

The project description also states: "A secondary access that is assumed in the city General Plan may be a consideration if the Hillcrest access does not ultimately come together. Such will be known prior to the entitlement of the project." For the purposes of this analysis, we assume sole access to the residential units will be provided from the southern extension of Hillcrest Avenue.

Project Trip Generation

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Estimates were created for the daily condition and for the peak one-hour period during the morning and afternoon peaks when traffic volumes generated by the project are expected to be the highest. Project trip generation was estimated using rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition), as presented in **Table 9**.

The project is expected to generate approximately 4,732 new daily vehicle trips, including approximately 288 morning peak hour and 488 evening peak hour trips. This includes the trip generating potential of both the single-family detached residences, as well as the proposed assisted living facility and neighborhood commercial uses.

Table 9: Vehicle Trip Generation Estimates

Use	Size	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Single-Family Detached Housing[1]	300 Dwelling Units	2,832	55	167	222	187	110	297
Assisted Living[2]	150 Beds	390	18	11	29	15	24	39
Neighborhood Commercial[3]	40k Sq. Ft.	1,510	24	14	38	73	79	152
Total Project Trips		***4,732***	***96***	***192***	***288***	***275***	***213***	***488***

1. ITE land use category 210 – Single-Family Detached Housing - Attached (Adj Streets, 7-9A, 4-6P):
   Daily: (T) = 9.44(X)
   AM Peak Hour: T = 0.74(X); Enter = 25%; Exit =75%
   PM Peak Hour: T = 0.99(X); Enter = 63%; Exit = 37%
2. ITE land use category 254 – Assisted Living (Adj Streets, 7-9A, 4-6P):
   Daily: (T) = 2.60(X)
   AM Peak Hour: T = 0.19(X); Enter = 63%; Exit =37%
   PM Peak Hour: T = 0.26(X); Enter = 38%; Exit = 62%
3. ITE land use category 820 – Shopping Center (Adj. Streets, 7-9A, 4-6P)
   Daily: (T) = 37.75(X)
   AM Peak Hour: T = 0.94(X); Enter = 62%; Exit =38%
   PM Peak Hour: T = 3.81(X); Enter = 48%; Exit = 52%

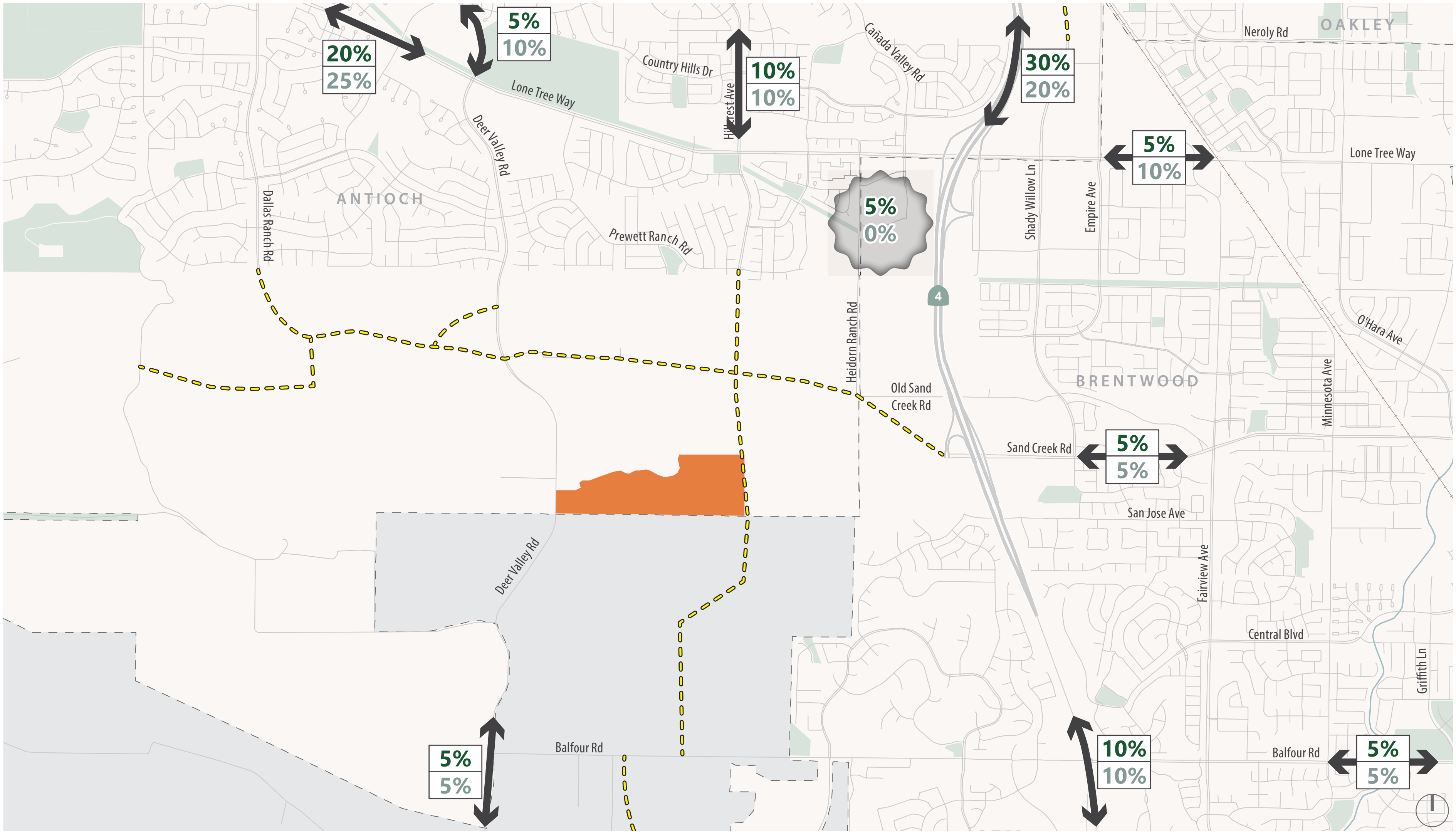
Source: *Trip Generation Manual* (10th Edition), ITE, 2017; Fehr & Peers, 2022.

Project Trip Distribution and Assignment

Project trip distribution refers to the directions of approach and departure that vehicles would take to access and leave the site. Estimates of regional project trip distribution were developed based on existing travel patterns in the area, a select zone analysis using the Contra Costa Transportation Authority (CCTA) travel demand model, and the location of complementary land uses. Separate estimates were developed for the residential, assisted living and neighborhood commercial portions of the project as they have different access points. The resulting trip distribution percentages are shown on **Figure 5.**

While the overall trip distribution is expected to be similar in various analysis scenarios, project trip assignment would differ between analysis scenarios as additional off-site roadways are constructed. For example, in the near-term scenario, Sand Creek Road would be extended from west of Hillcrest Avenue to State Route 4 (SR 4), providing an additional route for project trips to access SR 4 and destinations within the City of Brentwood.

In each analysis scenario, Project trips were assigned to the appropriate roadway network based on the directions of approach and departure, as shown on **Figure 6, Figure 7** and **Figure 8**.



Project Site

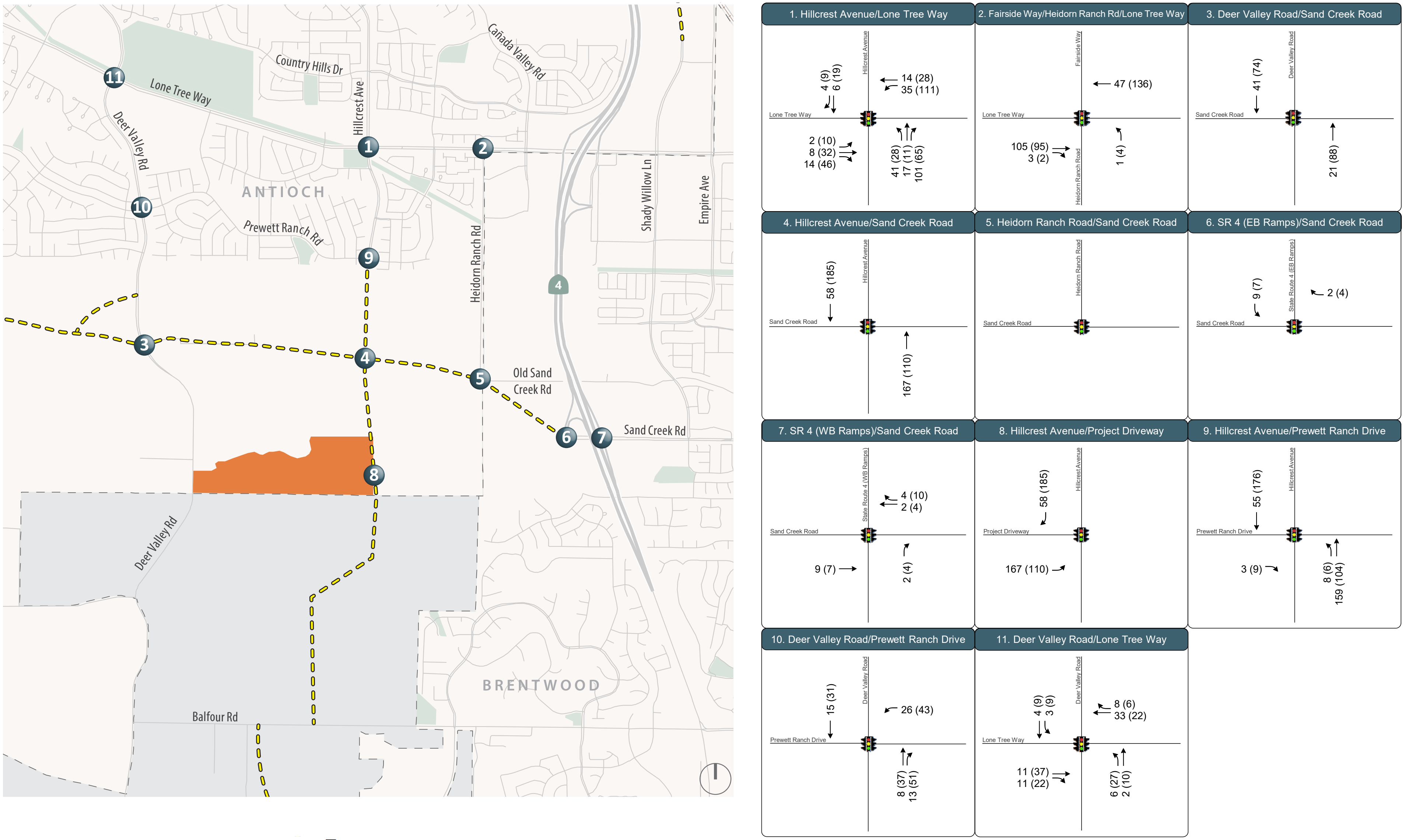
X% / Y%
Residential Project Trip Distribution
Assisted Living/Neighborhood Commercial Project Trip Distribution

Future Roadway

Figure 5

Project Trip Distribution

WC19-3641_5_TripDistro



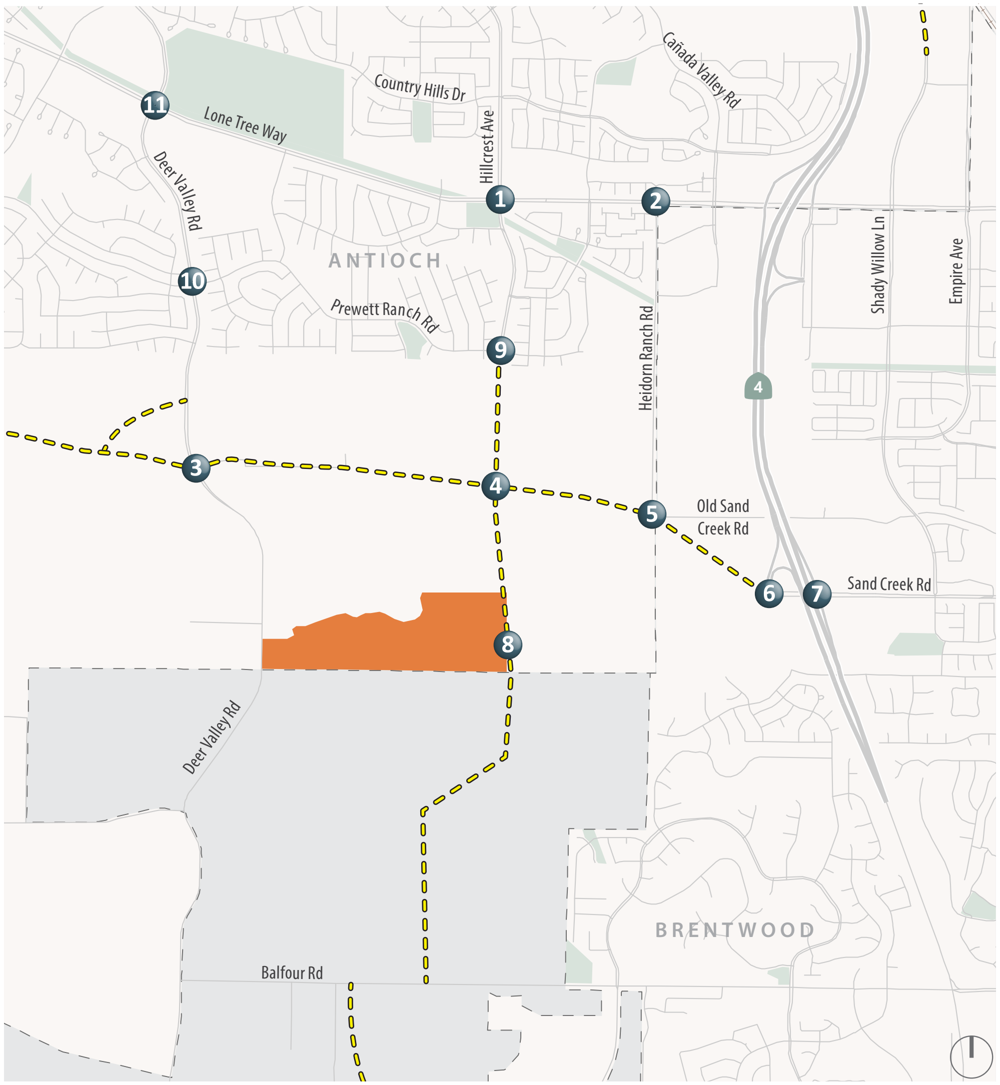
XX (YY) AM (PM) Peak Hour Traffic Volumes — Signalized Intersection

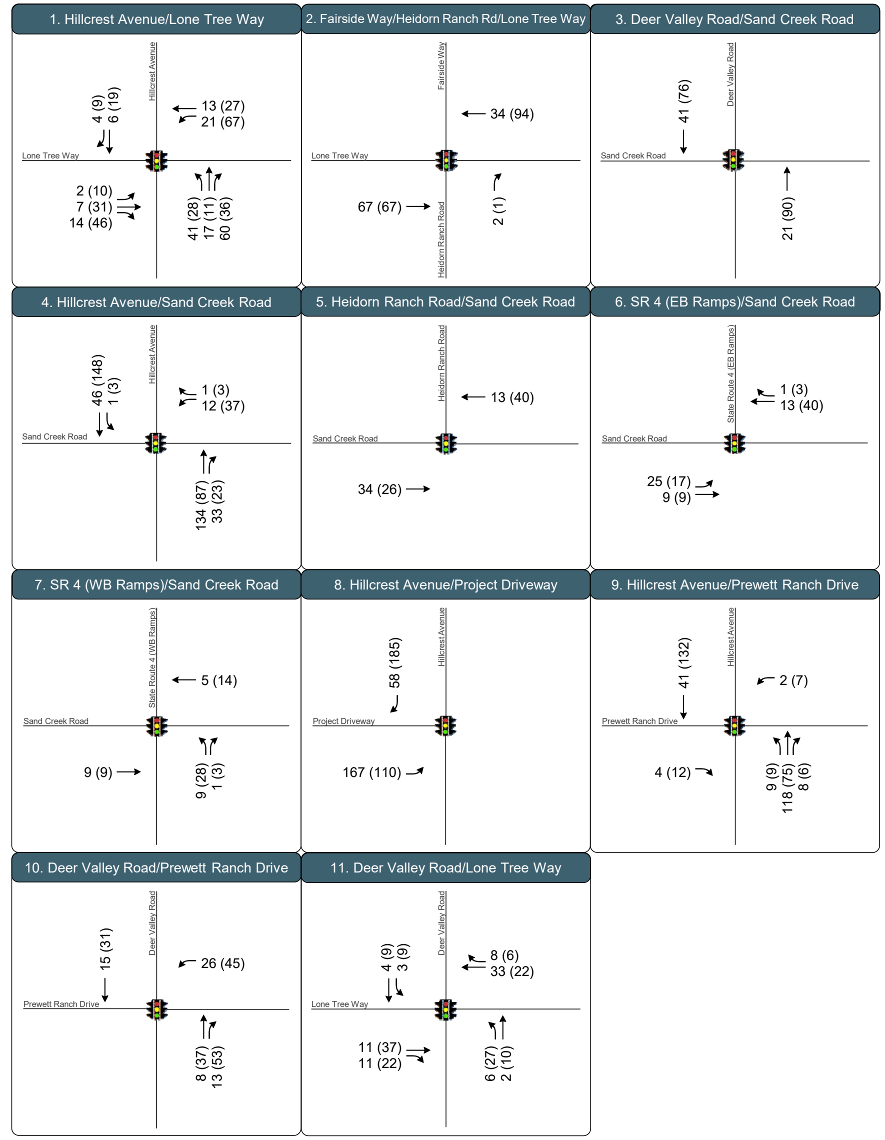
Project Site — Study Intersection — Future Roadway

Figure 6

Project Trip Assignment — Existing Roadway Network

WC19-3641_X_Volumes





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Project Site

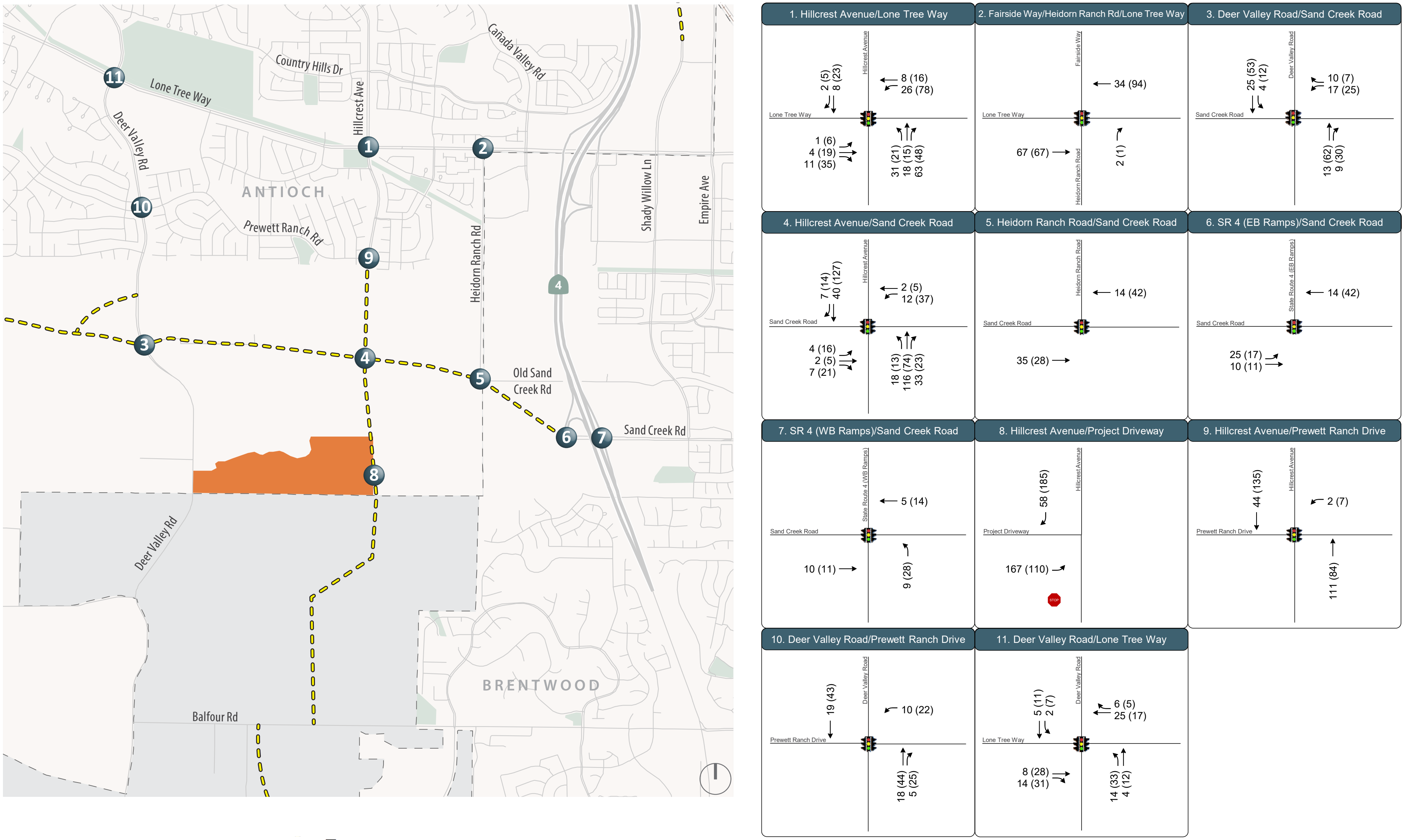
Study Intersection

Future Roadway

Figure 7

Project Trip Assignment — Near-Term Roadway Network

WC19-3641_X_Volumes



XX (YY) AM (PM) Peak Hour Traffic Volumes | Signalized Intersection | Stop Sign

Project Site | Study Intersection | Future Roadway

Figure 8

Project Trip Assignment — Cumulative Roadway Network

WC19-3641_X_Volumes

Existing With Project Conditions

This chapter evaluates the effects of the proposed project on the local roadway network.

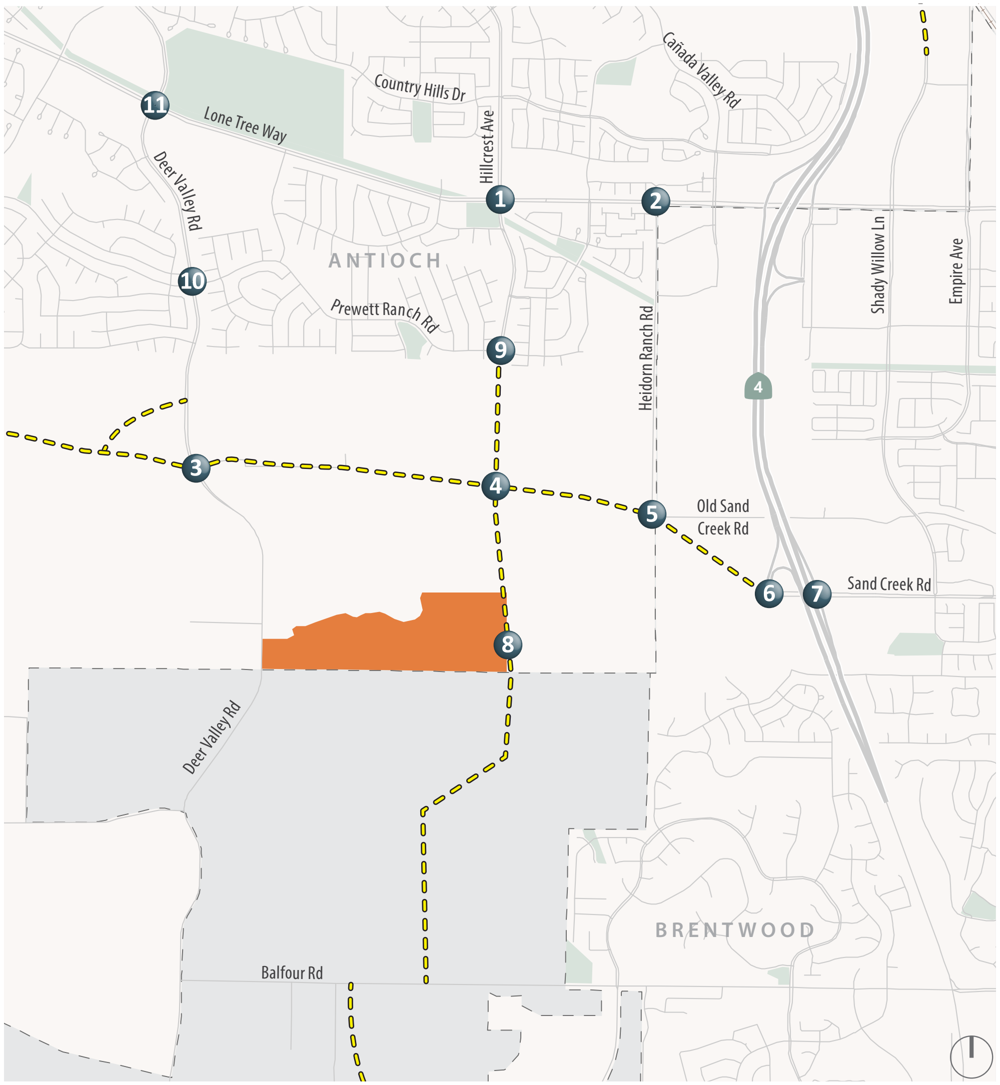
Existing With Project Traffic Volumes

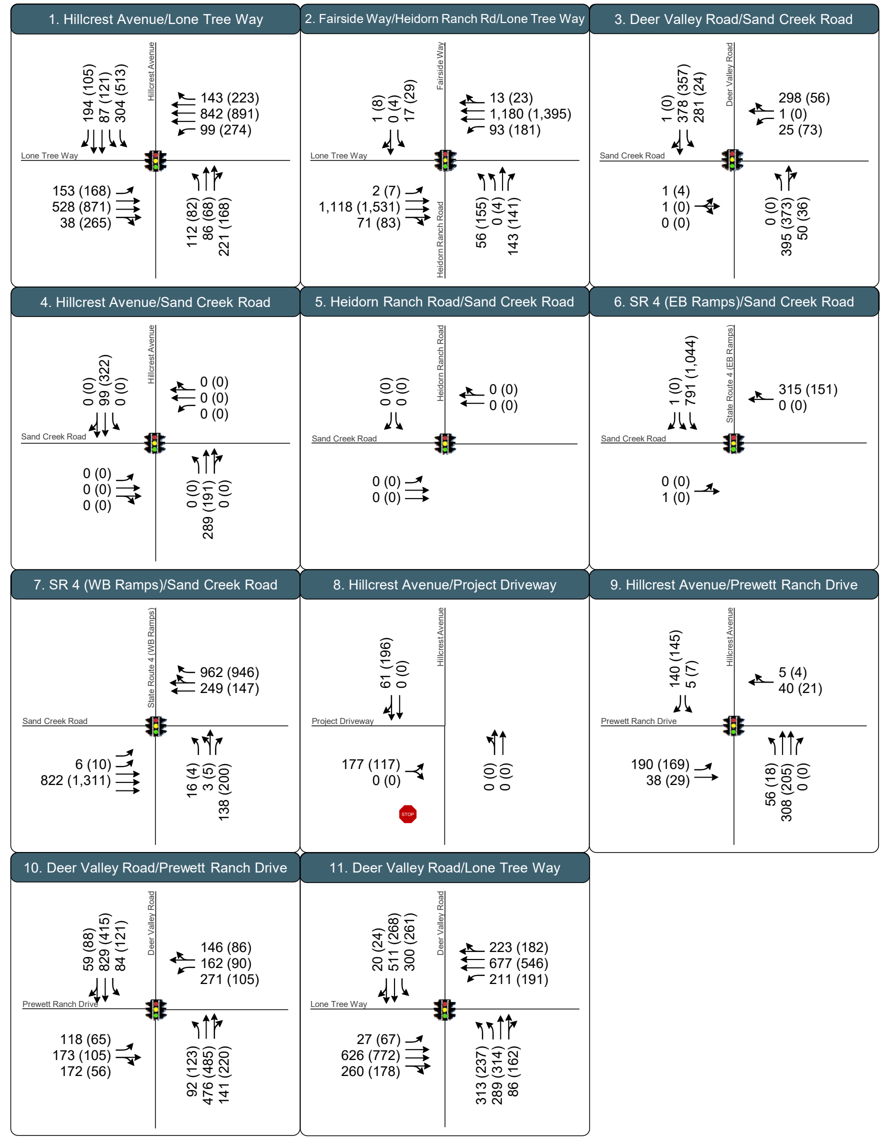
The project would not be constructed until both the Promenade and Creekside neighborhoods of the Vineyards at Sand Creek project are constructed, along with the associated Hillcrest Avenue extension from its current terminus at Prewett Ranch Drive to the southern extents of the Creekside project. This is because access to the project site could not be provided until Hillcrest Avenue is extended to the southern extents of the Creekside project; this roadway would be constructed as part of the Promenade and Creekside developments. While the precise timing of these extensions is unknown, they would need to occur prior to the proposed project. The project would then construct Hillcrest Avenue into the project site.

The Promenade development (model homes under construction at the time of data collection) will ultimately include 632 detached homes at buildout, including 192 market-rate homes and 440 age-restricted detached homes, generating approximately 3,690 daily trips, 248 morning peak hour and 322 evening peak hour trips. This level of trip generation from buildout of the Promenade was assumed in conjunction with the construction of Hillcrest Avenue along its project frontage to Sand Creek Road. Improvements to Heidorn Ranch Road would also be constructed such that vehicle trips generated by the Promenade would access the regional roadway network from Hillcrest Avenue and Heidorn Ranch Road; however, for the purposes of this analysis the connection of Sand Creek Road between Hillcrest Avenue and Heidorn Ranch Road was not assumed to present a conservative assessment of the effects of project traffic in the existing condition by assuming all project traffic would be concentrated along Hillcrest Avenue. This assumption allows for some flexibility in project construction timing, as construction of the proposed project could begin prior to buildout of the Promenade project, and construction of Sand Creek Road between Hillcrest Avenue and Heidorn Ranch Road.

The Creekside development will ultimately include 220 detached homes at buildout, generating approximately 2,080 daily trips, 163 morning peak hour and 218 evening peak hour trips. This level of trip generation from buildout of the Creekside development was assumed in conjunction with the construction of Hillcrest Avenue along its project frontage to the Project site.

The resulting Promenade and Creekside trip estimates were added, in conjunction with the project trips from **Figure 6** to the existing traffic volumes from **Figure 4** to develop Existing with Project traffic volumes, as presented in **Figure 9**.





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Project Site

Study Intersection

Future Roadway

Figure 9

Existing with Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Control

WC19-3641_X_Volumes

Analysis of Existing with Project Conditions

Intersection Operations

Existing with Project intersection operations were evaluated using the methods described in Chapter 1. The Existing with Project analysis results are presented in **Table 10**, based on the traffic volumes presented on **Figure 9**. Table 10 also includes the operations results for Existing conditions.

The addition of traffic from the Promenade and Creekside projects would increase delay at the study intersections, which would then further increase with the addition of project traffic. However, no study intersections are projected to degrade beyond the established level of service policies with the addition of project traffic in the existing condition.

Table 10: Existing with Project Conditions Peak Hour Intersection LOS Summary

Intersection		Control[1]	Peak Hour	Existing Conditions		Existing with Project Conditions	
				Delay[2, 3]	LOS	Delay[2, 3]	LOS
1	Lone Tree Way/Hillcrest Avenue	Signal	AM PM	18 21	B C	26 32	C C
2	Lone Tree Way/Heidorn Ranch Road & Fairside Way	Signal	AM PM	11 12	B B	11 15	B B
3	Sand Creek Road/Deer Valley Road	Signal	AM PM	10 6	A A	10 7	A A
4	Sand Creek Road/Hillcrest Avenue *(Future Intersection)*	Signal	AM PM	- -	- -	- -	- -
5	Sand Creek Road/Heidorn Ranch Road *(Future Intersection)*	Signal	AM PM	- -	- -	- -	- -
6	Sand Creek Road/State Route 4 Eastbound Ramps	Signal	AM PM	9 8	A A	9 7	A A
7	Sand Creek Road/State Route 4 Westbound Ramps	Signal	AM PM	5 5	A A	5 5	A A
8	Hillcrest Avenue/Project Access *(Future Intersection)*	SSSC	AM PM	- -	- -	7 (10) 4 (10)	A (A) A (A)
9	Hillcrest Avenue/Prewett Ranch Road	Signal	AM PM	19 17	B B	32 23	C C
10	Deer Valley Road/Prewett Ranch Road	Signal	AM PM	27 14	C B	32 16	C B
11	Deer Valley Road/Lone Tree Way	Signal	AM PM	30 21	C C	30 22	C C

Notes:
1. Signal = Signalized intersection; SSSC = Side-street stop-controlled intersections; traffic on the main street does not stop while traffic on the side-street is controlled by a stop sign.
2. Average intersection delay is calculated for all signalized intersections using the HCM 6th method for vehicles.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.
Source: Fehr & Peers, 2022.

Freeway Segment Operations

Project traffic volumes were added to the Existing condition volumes presented in Chapter 2 for study freeway segment. Freeway operations were evaluated using the same methods described previously. The resulting Existing with Project results are presented in **Table 11** and **Table 12** for the AM and PM peak hours, respectively. State Route 4 north of Sand Creek Road operates at free-flow speeds during both the morning and evening peak hours. With the recent widening of State Route 4 between Balfour Road and Sand Creek Road, and construction of an interchange, all mainline study freeway segments operate within the established service objective. With the addition of project traffic, these segments would continue to operate within the established service objectives.

However, there are greater levels of congestion on State Route 4 further west of the project site and the project would add vehicle traffic to these segments. The project's percentage of overall traffic would be small, but it would contribute to worsening levels of congestion along the State Route 4 corridor.

Table 11: Existing with Project Conditions Freeway Operations Summary – AM Peak Hour

Segment		Direction	Volume	Delay Index
1	State Route 4, north of Lone Tree Way	NB SB	2,843 3,039	1.01 1.02
2	State Route 4, north of Sand Creek Road	NB SB	2,544 2,848	1.01 1.01
3	State Route 4, north of Balfour Road	NB SB	2,069 2,036	1.00 1.00
4	State Route 4, south of Balfour Road	NB SB	1,250 960	1.28 1.03

Source: Fehr & Peers, 2022.

Table 12: Existing with Project Conditions Freeway Operations Summary – PM Peak Hour

Segment		Direction	Volume	Delay Index
1	State Route 4, north of Lone Tree Way	NB SB	3,885 3,092	1.16 1.03
2	State Route 4, north of Sand Creek Road	NB SB	3,250 3,043	1.04 1.02
3	State Route 4, north of Balfour Road	NB SB	2,078 2,288	1.00 1.00
4	State Route 4, south of Balfour Road	NB SB	1,058 1,492	1.07 2.14

Source: Fehr & Peers, 2022.

Near-Term Traffic Conditions

The near-term scenario reflects existing traffic plus traffic from approved and pending developments that are expected to be completed and occupied in the next 5 to 10 years. Near-term conditions with and without the project are evaluated. This scenario also includes transportation projects programmed for implementation around the time that the project is completed, and construction of required transportation mitigation measures for approved projects. The analysis of cumulative conditions (see Chapter 6 for details) considers development within the City of Antioch and surrounding jurisdictions (Brentwood, Oakley, and Unincorporated Contra Costa County) as described in their respective General Plans and approved General Plan Amendments (the cumulative assessment assumes buildout of the applicable General Plans).

Near-Term Traffic Forecasts

The available *City of Brentwood Project Status* as of March 2020 and *City of Antioch Project Pipeline* (as of March 2020) were reviewed to identify developments to include in this scenario. Developments that could generate additional traffic through the study area are summarized in Table 2 and their locations shown on Figure 3**.**

Near-Term project vehicle trip generation was estimated using trip generation rates and equations from ITE's *Trip Generation Manual* (10th Edition). The results are provided in **Appendix C**. Traffic generated by approved and pending developments was added to the existing traffic volumes to provide the basis for the Near-Term without Project analysis, as presented on **Figure 10.** The existing traffic counts were also increased by 5 percent to account for traffic growth from projects outside the immediate study area that could add through traffic to the area in the near-term condition. For counts taken in 2017, this five percent was added to the two percent increase applied to adjust those volumes to the 2019 baseline of the other counts (seven percent total increase). Project traffic volumes from **Figure 7** were added to the Near-Term without Project forecasts to estimate Near-Term with Project volumes at the study intersections, as presented on **Figure 11.**

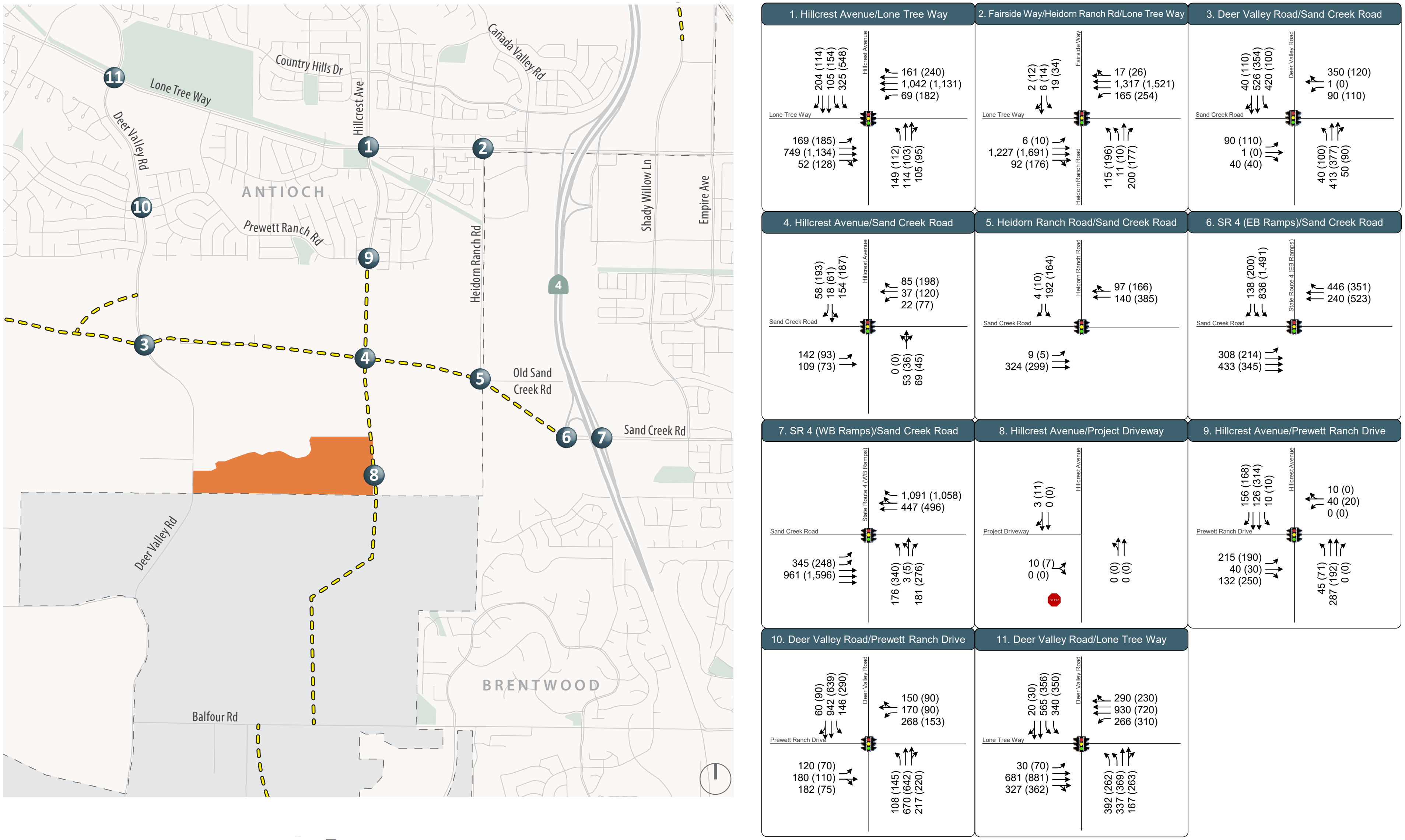
Near-Term Roadway Assumptions

A number of roadway improvements are conditioned on near-term developments and considered in the near-term forecasts, including:

- Extension of Hillcrest Avenue from its current terminus to an extension of Sand Creek Road
- Improvements to Heidorn Ranch Road along the frontage of the Vineyards at Sand Creek (Promenade) project and Heidorn Village Project

- Extension of Sand Creek Road from State Route 4 in the east to a new terminus by the Dozier-Libbey Medical High School (no change to the existing high school access is assumed in the near-term condition, with all access assumed to continue through Sand Creek Road to the west of the campus, adjacent to the Kaiser Hospital facility)
- Extension of Laurel Road from State Route 4 to its current terminus east of Canada Valley Road
- Extension of Prewett Ranch Drive to Heidorn Ranch Road
- Extension of Sand Creek Road to Dallas Ranch Road
- Improvements to Deer Valley Road along the frontage of the Ranch development

For the extension of Sand Creek Road, no direct through travel would be permitted between Deer Valley Road and Hillcrest Avenue; however, vehicles would be able to travel through Prewett Ranch Drive between Hillcrest Avenue and Deer Valley Road to access destinations to the west.



XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Project Site

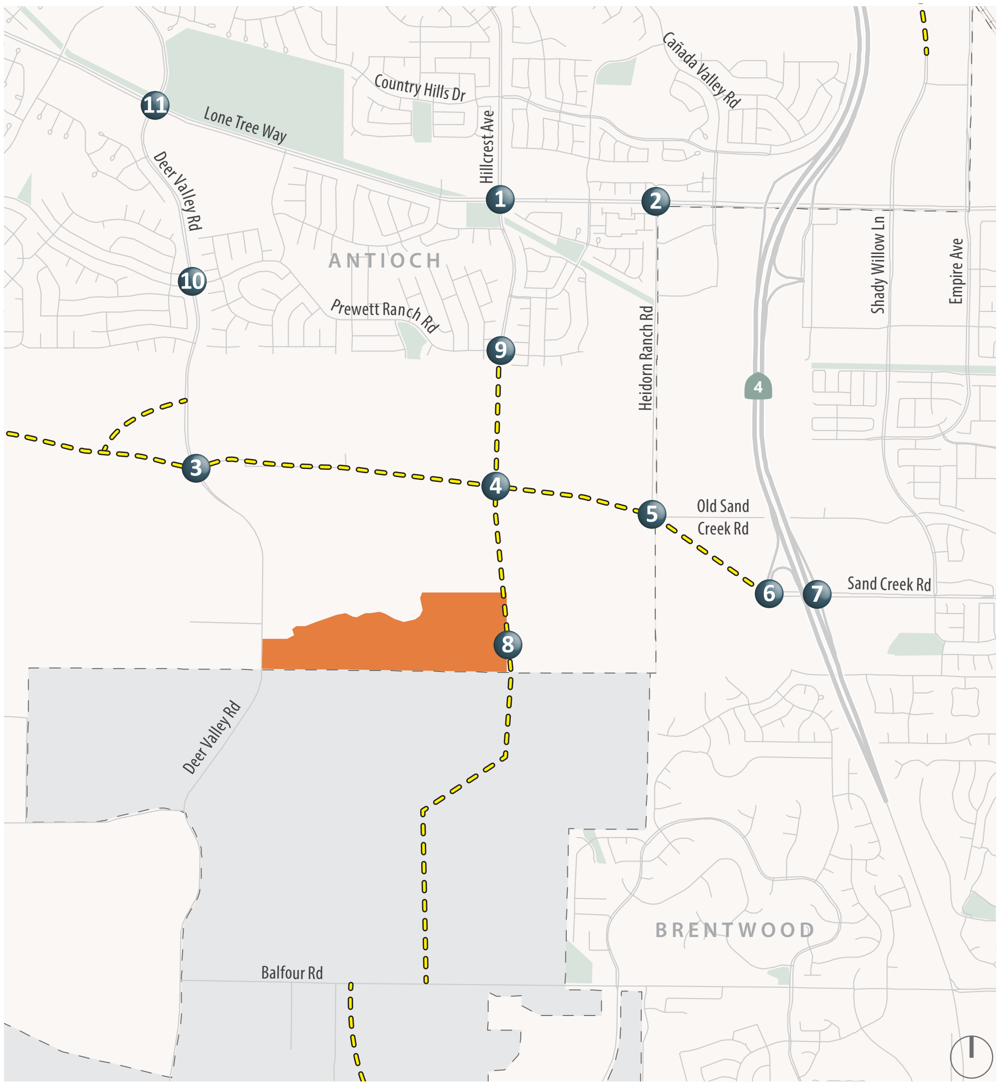
Study Intersection

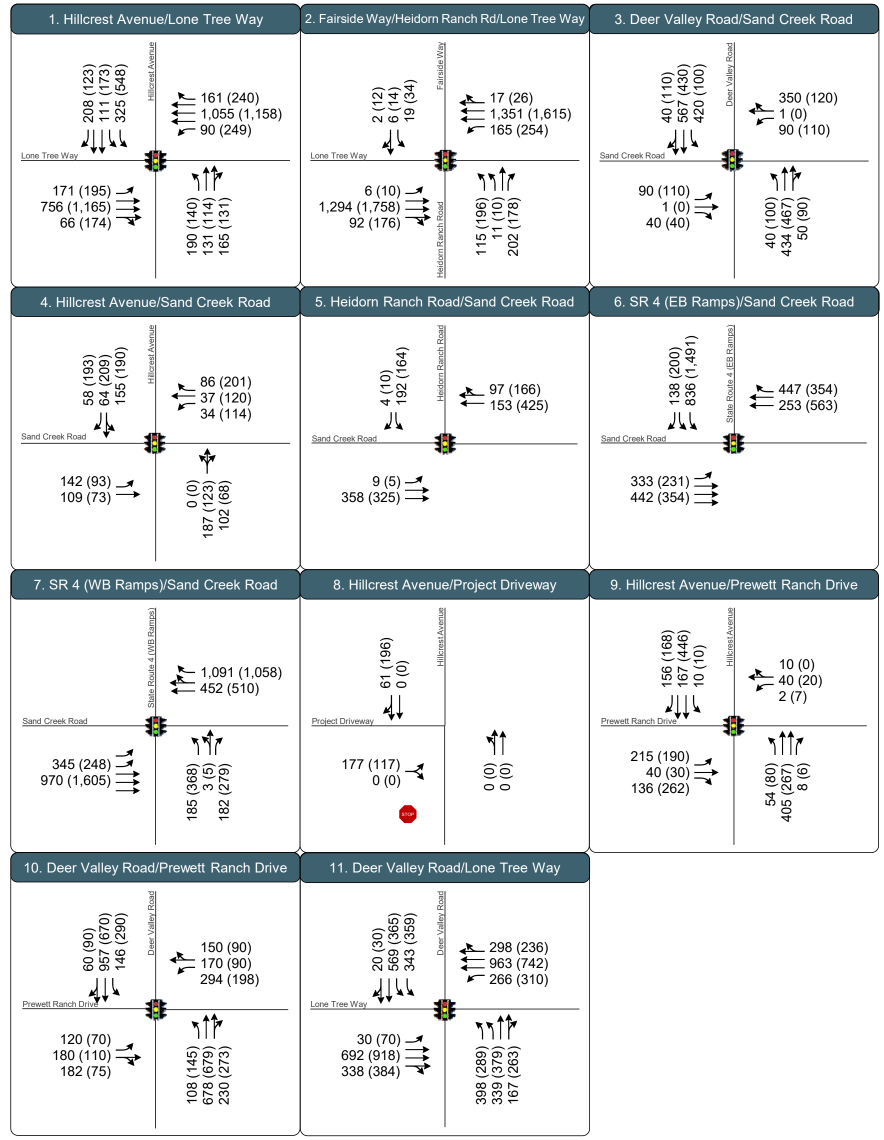
Future Roadway

Figure 10

Near-Term without Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Control

WC19-3641_X_Volumes





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Project Site

Study Intersection

Future Roadway

Figure 11

Near-Term with Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Control

WC19-3641_X_Volumes

Analysis of Near-Term Conditions

Intersection Operations

Near-Term without and with Project conditions were evaluated using the same methods described in Chapter 1; signal timings were left unchanged for intersections along Lone Tree Way. For existing or new signalized intersections on Sand Creek Road, signal timings were optimized with the same timings used for the evaluation of without and with project impacts. Where peak hour factors were less than 0.90 in the existing condition and preliminary analysis indicted poor operations, the peak hour factor was increased to 0.95.

The analysis results are presented in **Table 13**, based on the traffic volumes and lane configurations presented on Figure 10 and Figure 11. In the near-term condition, all study intersections would continue to operate at acceptable service levels prior to the addition of project traffic. With the addition of project traffic, all study intersections would continue to operate within established level of service ranges.

Table 13: Near-Term Conditions Peak Hour Intersection LOS Summary

	Intersection	Control[1]	Peak Hour	Near-Term without Project		Near-Term with Project	
				Delay[2, 3]	LOS	Delay[2, 3]	LOS
1	Lone Tree Way/Hillcrest Avenue	Signal	AM PM	22 45	C D	29 54	C D
2	Lone Tree Way/Heidorn Ranch Road & Fairside Way	Signal	AM PM	17 26	B C	17 27	B C
3	Sand Creek Road/Deer Valley Road	Signal	AM PM	19 17	B B	19 17	B B
4	Sand Creek Road/Hillcrest Avenue	Signal	AM PM	22 20	C C	29 28	C C
5	Sand Creek Road/Heidorn Ranch Road	Signal	AM PM	19 19	B B	19 19	B B
6	Sand Creek Road/State Route 4 Eastbound Ramps	Signal	AM PM	25 39	C D	28 44	C D
7	Sand Creek Road/State Route 4 Westbound Ramps	Signal	AM PM	9 10	A B	9 10	A B
8	Hillcrest Avenue/Project Access	SSSC	AM PM	7 (9) 3 (9)	A (A) A (A)	7 (10) 4 (10)	A (A) A (A)
9	Hillcrest Avenue/Prewett Ranch Road	Signal	AM PM	20 15	C B	21 17	C B
10	Deer Valley Road/Prewett Ranch Road	Signal	AM PM	47 26	D C	49 30	D C
11	Deer Valley Road/Lone Tree Way	Signal	AM PM	40 33	D C	41 35	D D

Notes:
1. Signal = Signalized intersection; SSSC = Side-street stop-controlled intersections; traffic on the main street does not stop while traffic on the side-street is controlled by a stop sign.
2. Average intersection delay is calculated for all signalized intersections using the HCM 6th method for vehicles.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.
Source: Fehr & Peers, 2022.

Vehicle queues are expected to increase at study intersections as traffic volumes increase, which would further increase with the addition of project traffic. Monitoring and adjusting traffic signal timings in response to actual traffic volumes to minimize the potential for vehicle queue spillback is recommended.

Freeway Segment Operations

Near-term freeway forecasts were developed based on the same method used to develop the near-term intersection forecasts, both without and with the project. Operations were evaluated using the same methods described previously. No freeway improvements were included in the evaluation of near-term freeway operations. The near-term without and with project analysis results are presented in **Table 14** and **Table 15** for the AM and PM peak hours, respectively, based on the estimates of near-term traffic volumes, plus estimates of project traffic. In the near-term condition, operations of State Route 4 between Marsh Creek Road and Balfour Road are expected to degrade beyond the standard set by CCTA; the addition of any traffic is considered a violation of this policy. All other freeway segments would continue to operate within acceptable standards.

Table 14: Near-Term Conditions Freeway Operations Summary – AM Peak Hour

Segment		Direction	Near-Term Without Project		Near-Term With Project	
			Volume	Delay Index	Volume	Delay Index
1	State Route 4, north of Lone Tree Way	NB SB	3,328 3,632	1.05 1.09	3,354 3,689	1.05 1.10
2	State Route 4, north of Sand Creek Road	NB SB	2,982 3,452	1.02 1.06	2,982 3,452	1.02 1.06
3	State Route 4, north of Balfour Road	NB SB	2,749 2,393	1.01 1.00	2,774 2,402	1.01 1.00
4	State Route 4, south of Balfour Road	NB SB	1,793 1,258	**5.97** 1.29	1,812 1,268	**6.41** 1.31

Source: Fehr & Peers, 2022.

Table 15: Near-Term Conditions Freeway Operations Summary – PM Peak Hour

Segment		Direction	Near-Term Without Project		Near-Term With Project	
			Volume	Delay Index	Volume	Delay Index
1	State Route 4, north of Lone Tree Way	NB SB	4,677 3,580	1.70 1.08	4,751 3,631	1.79 1.09
2	State Route 4, north of Sand Creek Road	NB SB	3,911 3,483	1.17 1.07	3,911 3,483	1.17 1.07
3	State Route 4, north of Balfour Road	NB SB	2,710 2,819	1.01 1.01	2,727 2,847	1.01 1.01
4	State Route 4, south of Balfour Road	NB SB	1,502 1,932	2.20 **10.03**	1,523 1,960	2.35 **11.13**

Source: Fehr & Peers, 2022.

Near-Term Violations of LOS Policies

Based on the freeway analysis results presented in Table 14 and Table 15 the project is expected to worsen the delay index along the State Route 4 corridor where deficient operations are projected to occur in the near-term condition; this is considered a violation of CCTA policy. Additionally, the project would contribute to worsening congestion on other segments of State Route 4 not explicitly evaluated. Implementation of the following measure by the project would result in acceptable operations under Near Term plus Project conditions.

> **Improvement Recommendation #1** – The project applicant shall pay their fair share towards freeway improvement projects in the area, including the widening of State Route 4 between Balfour Road and Marsh Creek Road through the payment of the regional transportation impact fees to the East Contra Costa Regional Fee and Financing Authority (ECCRFFA).

Cumulative Traffic Conditions

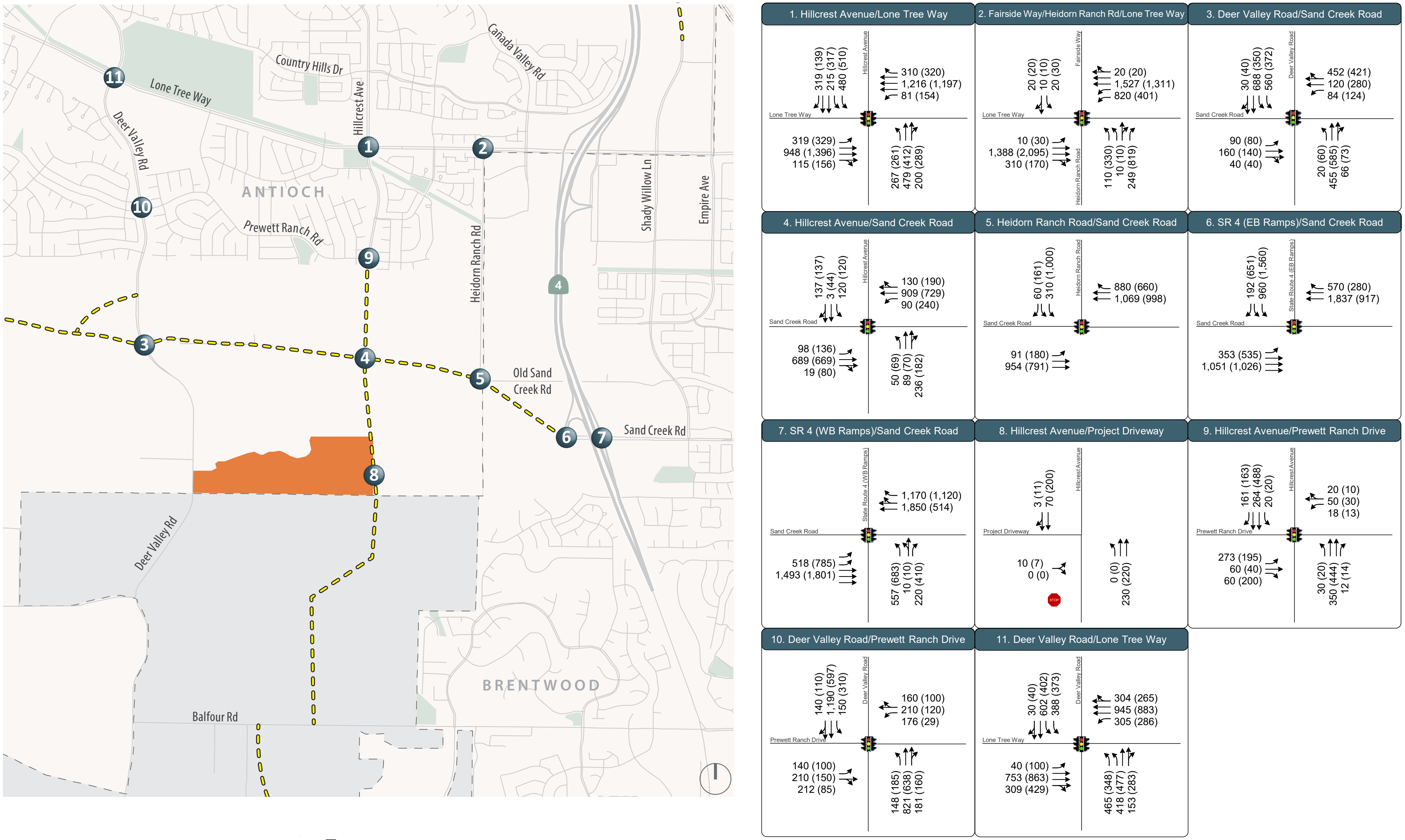
This chapter discusses Cumulative traffic conditions both without and with the project. The future conditions analysis considers development within the City of Antioch as described in the General Plan, as well as development in in the surrounding communities, including Brentwood and Oakley.

Cumulative Traffic Forecasts

To assess future growth with planned development in the East County Area, several sources of data were reviewed, including the Contra Costa Transportation Authority Travel Demand Model (CCTA Model), future traffic projections as documented in the administrative draft Antioch Transportation Impact Fee, future projections from the City of Brentwood Priority Area 1 Specific Plan EIR, June 2018, and projections developed as part of the Aviano, Promenade and Creekside transportation impact studies. Traffic forecasts within the immediate study area were reviewed to ensure that known developments were adequately reflected in the forecasts, such as the Bridle Gate project located on the north and south side of the proposed Sand Creek extensions and west of State Route 4. Minor adjustments were made to the forecasts to balance traffic volumes between closely spaced intersections in the study area.

In November 2019, voters in the City of Brentwood defeated Measure L that would have permitted the construction of the Vineyards at Deer Creek project. That project would have extended Hillcrest Avenue from the southern property line to Balfour Road as a private roadway, in conjunction with other development. As Measure L was defeated, development of that parcel and extension of Hillcrest Avenue to the south of the project site is not expected to occur until there is a successful referendum. However, as this roadway connection is shown in the City of Brentwood Circulation Element, and development assumed on that parcel within the City of Brentwood General Plan, development of the Vineyards at Deer Creek project was considered as part of the background cumulative condition. As no project traffic would use Hillcrest Road south of the southern project boundary, inclusion of this project and associated roadway improvements presents a conservative worst-case assessment of future conditions. Excluding the Vineyards at Deer Creek project and associated roadway improvements would not change the overall conclusions of this study or change the project mitigation requirements in the Cumulative condition.

The resulting Cumulative without Project forecasts are presented on **Figure 12**, which are representative of conditions over the next 20 to 25 years. Cumulative volumes to not correspond to a particular horizon year but reflect buildout of the General Plans of the surrounding communities. The project volumes from Figure 8 were added to the Cumulative without Project traffic volumes to represent Cumulative with Project conditions, as presented on **Figure 13.** Volumes for some movements on Lone Tree Way decrease as compared to the near-term condition due to the completion of the Sand Creek Road extension as well as planned development in Priority Area One that is expected to change travel patterns along the Lone Tree Way corridor.



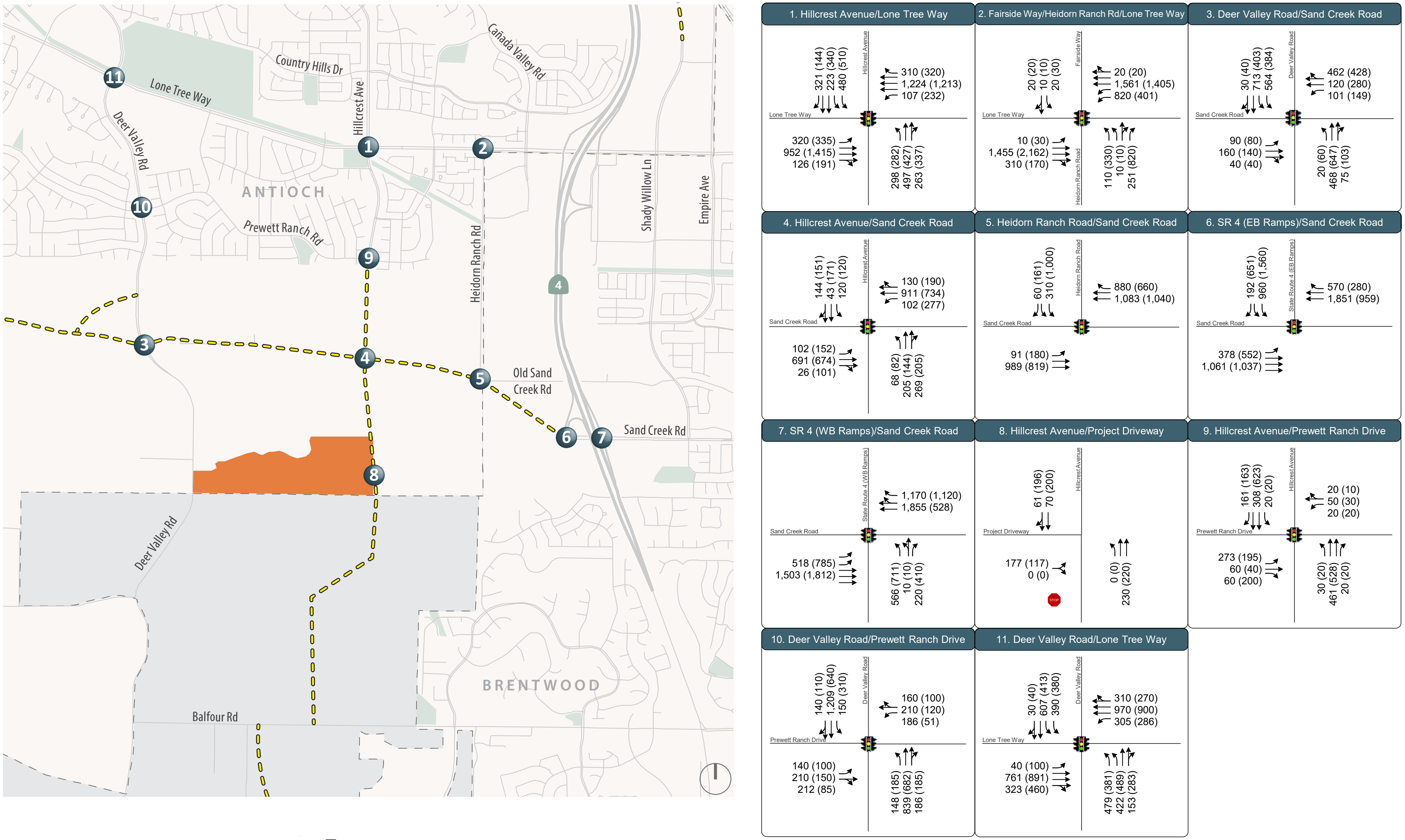
XX (YY) AM (PM) Peak Hour Traffic Volumes — Signalized Intersection — Stop Sign

Project Site — # Study Intersection — Future Roadway

Figure 12

Cumulative without Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Control

WC19-3641_X_Volumes



XX (YY) AM (PM) Peak Hour Traffic Volumes — Signalized Intersection — Stop Sign

Project Site — # Study Intersection — Future Roadway

Figure 13

Cumulative with Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Control

WC19-3641_X_Volumes

Cumulative Roadway Assumptions

For the analysis of the cumulative condition, a number of roadway improvements were assumed. Some improvements would be completed in the near-term with the following roadway network improvements are assumed to be completed by the cumulative condition:

- Extension of Hillcrest Avenue from its current terminus to an extension of Sand Creek Road (near-term)
- Extension of Hillcrest Avenue from the southern project terminus to Balfour Road as a gated private roadway (cumulative) [note: no project traffic was assumed to use this roadway connection]
- Widening of Heidorn Ranch Road to four lanes from south of Lone Tree Plaza Drive to Sand Creek Road (partially in near-term, completed in cumulative)
- Extension of Sand Creek Road from State Route 4 in the east to Deer Valley Road (extension from SR 4 to Dozier-Libbey in the near-term and from Dozier-Libbey to Deer Valley in cumulative)
- Extension of Dallas Ranch Road from current terminus to Deer Valley Road (near-term)
- Laurel Road extension from State Route 4 to its current terminus east of Canada Valley Road (near-term)
- Widening of State Route 4 to provide two travel lanes in each direction from south of Balfour Road to Marsh Creek Road (cumulative)
- Improvements to the Lone Tree Way at Heidorn Ranch Road intersection conditioned on development in Brentwood as part of Priority Area One (cumulative)
- Extension of Slatten Ranch Road to Laurel Road (cumulative)

As part of the Creekside project, roadway improvements would be constructed to extend Hillcrest Avenue from Sand Creek Road to the southern property line. No project traffic or through traffic was assigned to Hillcrest Avenue between the southern Albers Ranch property line and Balfour Road as that portion of roadway is proposed to be a private gated roadway. An assessment of on-site intersections is provided in the site plan review chapter. For the analysis of cumulative conditions, it was assumed that Hillcrest Avenue would provide two through lanes in each direction at the Sand Creek Road intersection. The assumed lane configurations in each cumulative scenario are shown on Figure 13 (without project) and Figure 14 (with project).

Further upgrades to the Sand Creek Road/State Route 4 interchange are planned but not fully funded; therefore, additional improvements are not assumed in the analysis of cumulative conditions as the timing of those improvements is uncertain.

Vehicle traffic generated by the proposed project would contribute to the need for local and regional roadway improvements. The project would contribute to the construction of regional roadway improvements through the payment of regional transportation impact fees to the East Contra Costa Regional Fee and Financing Authority (ECCRFFA).

Analysis of Cumulative Conditions

Intersection Operations

Cumulative without and with Project conditions were evaluated using the same methods described in Chapter 1; signal timings were optimized from the existing condition with the same timings used for the evaluation of without and with project conditions. The analysis results are presented in **Table 16,** based on the traffic volumes presented on Figure 13 and Figure 14. Four intersections are projected to operate at deficient levels in the cumulative condition prior to the addition of project traffic:

- Lone Tree Way at Hillcrest Avenue – LOS E AM Peak Hour
- Sand Creek Road at State Route 4 Eastbound Ramps – LOS F AM and PM Peak Hour
- Sand Creek Road at State Route 4 Westbound Ramps – LOS E AM Peak Hour
- Prewett Ranch Drive/Hillcrest Avenue – LOS E AM Peak Hour

The project would add vehicle traffic to these intersections, resulting in violation of the City's LOS policies. At the Sand Creek Road at State Route 4 Eastbound Ramps intersection there is a planned improvement to construct a diagonal on-ramp for eastbound Sand Creek Road to southbound State Route 4; this improvement is included in the East Contra Costa Regional Fee and Financing Authority (ECCRFFA) regional fee program.

Poor operations at the Sand Creek Road at State Route 4 Westbound Ramps intersection are primarily caused development as approved in the Priority Area One Specific Plan. Construction of an additional westbound right-turn only lane from westbound Sand Creek Road to northbound State Route 4 would result in acceptable operations at this intersection. That improvement is not identified in the regional fee program. Should that improvement, or one of similar effectiveness, be added to the ECCRFFA program, the proposed project and other projects in Eastern Contra Costa County would pay their fair share towards its construction.

The project applicant will be required to participate in all applicable local and regional transportation impact fees, such as the ECCRFFA program, that would fund construction of roadway improvements in the study area, including further improvements to the Sand Creek Road interchange.

Table 16: Cumulative Conditions Peak Hour Intersection LOS Summary

	Intersection	Control[1]	Peak Hour	Cumulative without Project		Cumulative with Project	
				Delay[2, 3]	LOS	Delay[2, 3]	LOS
1	Lone Tree Way/Hillcrest Avenue	Signal	AM PM	**61** 50	**E** D	***76*** **64**	***E*** ***E***
2	Lone Tree Way/Heidorn Ranch Road & Fairside Way	Signal	AM PM	23 35	C D	29 36	C D
3	Sand Creek Road/Deer Valley Road	Signal	AM PM	20 21	B C	20 22	C C
4	Sand Creek Road/Hillcrest Avenue	Signal	AM PM	46 52	D D	45 50	D D
5	Sand Creek Road/Heidorn Ranch Road	Signal	AM PM	15 33	B C	15 36	B D
6	Sand Creek Road/State Route 4 Eastbound Ramps	Signal	AM PM	**93** **99**	**F** **F**	***97*** ***105***	***F*** ***F***
7	Sand Creek Road/State Route 4 Westbound Ramps	Signal	AM PM	**72** 29	**E** C	***73*** 30	***E*** C
8	Hillcrest Avenue/Project Access	SSSC	AM PM	1 (10) 1 (11)	A (A) A (B)	4 (12) 2 (14)	A (B) A (B)
9	Hillcrest Avenue/Prewett Ranch Road	Signal	AM PM	31 16	C B	32 16	C B
10	Deer Valley Road/Prewett Ranch Road	Signal	AM PM	**62** 26	**E** C	***63*** 28	***E*** C
11	Deer Valley Road/Lone Tree Way	Signal	AM PM	44 45	D D	46 51	D D

Notes:
Bold text indicates potentially unacceptable intersection operations. ***Bold italics*** indicates a noticeable effect on operations and potential violations of City LOS policies (Level of Service Policy C – Addition of project traffic to an intersection already operating at an unacceptable condition).
1. Signal = Signalized intersection; SSSC = Side-street stop-controlled intersections; traffic on the main street does not stop while traffic on the side-street is controlled by a stop sign.
2. Average intersection delay is calculated for all signalized intersections using the HCM 6th method for vehicles.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.
Source: Fehr & Peers, 2022.

Vehicle queues are expected to increase at study intersections as traffic volumes increase, which would further increase with the addition of Project traffic. Monitoring and adjusting traffic signal timings in response to actual traffic volumes to minimize the potential for vehicle queue spillback is recommended.

Freeway Segment Operations

Cumulative freeway forecasts were developed based on the same method used to develop the cumulative intersection forecasts, both without and with the project. Operations were evaluated using the same methods described previously. The Cumulative without and with Project analysis results are presented in **Table 17** and **Table 18** for the AM and PM peak hours, respectively, based on the estimates of cumulative traffic volumes, plus estimates of project traffic. In the cumulative condition, all study segments are projected to operate within the desired standard, considering the widening of State Route 4 between Balfour Road to Marsh Creek Road to provide two lanes in each direction. The project would add to recurring congestion on the State Route 4 corridor through Antioch and Pittsburg, although these segments are not explicitly evaluated in this study.

Table 17: Cumulative Conditions Freeway Operations Summary – AM Peak Hour

	Segment	Direction	Cumulative Without Project		Cumulative With Project	
			Volume	Delay Index	Volume	Delay Index
1	State Route 4, north of Lone Tree Way	NB SB	3,652 3,998	1.09 1.18	3,652 3,998	1.10 1.20
2	State Route 4, north of Sand Creek Road	NB SB	2,602 3,478	1.01 1.06	2,602 3,478	1.01 1.07
3	State Route 4, north of Balfour Road	NB SB	2,398 2,576	1.00 1.01	2,398 2,576	1.00 1.01
4	State Route 4, south of Balfour Road	NB SB	1,432 1,254	1.00 1.00	1,432 1,254	1.00 1.00

Source: Fehr & Peers, 2022.

Table 18: Cumulative Conditions Freeway Operations Summary – PM Peak Hour

	Segment	Direction	Cumulative Without Project		Cumulative With Project	
			Volume	Delay Index	Volume	Delay Index
1	State Route 4, north of Lone Tree Way	NB SB	5,031 4,595	2.17 1.58	5,031 4,595	2.25 1.61
2	State Route 4, north of Sand Creek Road	NB SB	4,241 4,085	1.30 1.23	4,241 4,085	1.32 1.24
3	State Route 4, north of Balfour Road	NB SB	2,862 3,301	1.01 1.04	2,862 3,301	1.01 1.04
4	State Route 4, south of Balfour Road	NB SB	1,768 2,414	1.00 1.00	1,768 2,414	1.00 1.00

Source: Fehr & Peers, 2022.

Signal Warrants

To assess the need for signalization of stop-controlled intersections, the Manual of Uniform Traffic Control (MUTCD) (Federal Highway Administration) presents nine signal warrants. The Peak Hour Volume Warrant and the Peak Hour Delay Warrant were used in this study as a supplemental analysis tool to assess operations at unsignalized intersections. The intersection of Hillcrest Avenue and the Project Access does not meet the peak hour signal warrants in the cumulative plus project scenario (or any of the analysis scenarios). Signal warrant worksheets are presented in **Appendix D.**

Cumulative Conditions Violations of City LOS Policies

Based on the intersection LOS results presented in Table 16 the addition of project traffic to cumulative baseline traffic levels would result in violations of the City's policies at the intersections previously identified above. Implementation of the following measures by the project would result in acceptable operations under Cumulative plus Project conditions.

> **Improvement Recommendation #2** – Lone Tree Way at Hillcrest Avenue - Implement improvements that would improve operations to LOS D within the existing right-of-way, which could include modifying the eastbound approach to provide two left-turn lanes, two through lanes and a through-right-shared lane through the reconstruction of the median, restriping, and signal modifications. The outside curbs may need to be modified to provide for appropriate lane-alignments. A reimbursement agreement could be established with the City of Antioch to collect proportionate shares from other developments that would benefit from this improvement.

> **Improvement Recommendation #3** – Sand Creek Road at SR 4 Eastbound Ramps - The project should pay their proportionate share of the improvements that would improve operations through participation in the ECCRFFA regional fee program. Planned improvements include construction of a slip-ramp for the eastbound Sand Creek to southbound State Route 4 movement, eliminating the conflicting left-turn movement at the intersection.

> **Improvement Recommendation #4** – Sand Creek Road at SR4 Westbound Ramps - The project should pay their proportionate share of improvements that would provide acceptable operations or participate in the ECCRFFA regional fee program if improvements that would result in acceptable operations at this intersection are added to the fee program. Modifying the westbound approach to provide two through lanes and two right-turn only lanes would result in acceptable operations during the morning peak hour.

> **Improvement Recommendation #5** – Prewett Ranch Drive at Hillcrest Avenue - This intersection has been built-out to its ultimate right-of-way, and the City of Antioch has not identified any

improvement measures. Construction of both a westbound and eastbound right-turn lanes would result in LOS D operations, or construction of a southbound right-turn only lane. These improvements would require right-of-way acquisition, and would increase the pedestrian crossing distance, and well as increase conflicts for bicyclists.

Environmental Assessment

This chapter presents the results of the assessment of the project's potential impacts regarding transportation related environmental topics, including Vehicle Miles Traveled, Pedestrian Facilities, Bicycle Facilities, Transit Facilities and Emergency Vehicle Access.

Vehicle Miles Traveled

This chapter discusses the governing legislation regarding vehicle-miles traveled (VMT), and the proposed project's effects on the different transportation systems in the area.

On September 27, 2013, Senate Bill (SB) 743 was signed into law. The California state legislature found that with the adoption of the Sustainable Communities and Climate Protection Act of 2008 (SB 375), the State had signaled its commitment to encourage land use and transportation planning decisions and investments that reduce vehicle miles traveled and thereby contribute to the reduction of greenhouse gas emissions, as required by the California Global Warming Solutions Act of 2006 (Assembly Bill 32). In December 2018, the Governor's Office of Planning and Research (OPR) finalized new CEQA guidelines (CEQA Guidelines section 15064.3), that identify vehicle-miles traveled (VMT) as the most appropriate criteria to evaluate a project's transportation impacts.

The implementation of SB 743 eliminated the use of criteria such as auto delay, level of service, and similar measures of vehicle capacity of traffic congestion as the basis for determining significant impacts as part of CEQA compliance. The SB 743 VMT criteria promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.

In November 2017, OPR released a technical advisory containing recommendations regarding the assessment of VMT, proposed thresholds of significance, and potential mitigation measures for lead agencies to use while implementing the required changes contained in Senate Bill 743 (SB 743). Also in November 2017, OPR released the proposed text for Section 15064.3, "Determining the Significance of Transportation Impacts," which summarized the criteria for analyzing transportation impacts for land use projects and transportation projects and directs lead agencies to "choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure." OPR recommends that for most instances a per service population threshold should be adopted and that a fifteen percent reduction below that of existing development would be a reasonable threshold.

On July 15, 2020, the Contra Costa Transportation Authority (CCTA) adopted criteria, standards, and thresholds for the assessment of VMT (CCTA, *Approval of the Vehicle Miles Traveled Analysis Methodology for Land Use Projects in the Growth Management Program*, July 15, 2020). The methods and thresholds adopted by CCTA follow the guidance and recommendations of OPR pertaining to the implementation of SB 743.

As the City of Antioch has not yet formally adopted VMT criteria, standards, or thresholds at the time this report was prepared, this assessment follows the current OPR and CCTA guidance related to VMT.

Analysis Methods

To conduct the VMT assessment, the CCTA travel demand model was used to estimate average daily vehicle miles of travel for each of the project's proposed components. Per CCTA guidance, home-based VMT was used to evaluate project generated VMT for the residential portion of the project. For the purposes of the VMT Analysis, the project's Assisted Living Facility was categorized as employment-generating, given that the trip generating potential of its employees is higher than that of its residents. As such, home-work VMT was used to evaluate the project generated VMT for the assisted living portion of the project. The project's "neighborhood commercial" component is assumed to be a Local-Serving Use and is therefore presumed to have a less-than-significant impact, since these types of projects will primarily draw users and customers from a relatively small geographic area that will lead to short-distance trips and trips that are linked to other destinations. The existing baseline average daily home-based VMT per resident and home-work VMT per employee for the City of Antioch, Contra Costa County and the Bay Area are presented in **Table 19** and **Table 20.**

Table 19: Baseline Average Daily Home Based VMT Per Resident

Land Use Type	Antioch	Contra Costa County	Bay Area
Home-Based VMT	21.1	16.1	12.7

Source: CCTA Travel Demand Model, Fehr & Peers, 2022.

Table 20: Baseline Average Daily Commute VMT Per Employee

Land Use Type	Antioch	Contra Costa County	Bay Area
Home-Work VMT	12.1	15.2	15.8

Source: CCTA Travel Demand Model, Fehr & Peers, 2022.

Analysis Results

A select zone analysis was conducted using the CCTA model whereby all the trips generated by each the project's components were tracked through the transportation system. Based on this analysis, each resident of the single-family dwelling portion of the project is estimated to generate approximately 35.5 vehicle miles of travel per day. This includes all trips that either start or end at home. This level of vehicle travel is higher than the City of Antioch average as well as the County Average. This increase in vehicle miles of travel as compared to the City and County-wide averages is due to the project's distance from major employment centers as well as the relative distance to other destinations as compared to other parts of the City and County.

Additionally, each employee of the project's Assisted Living Facility is estimated to generate approximately 23.2 vehicle miles of travel per day. This includes all trips that start at home and end at work, or vice-versa. This level of vehicle travel is higher than the City of Antioch average as well as the Bay Area Average.

Impact Statement 1: Home-Based Project Generated VMT – Project Residents

The results of the VMT analysis indicate that the project would contribute to an increase in home-based vehicle miles of travel on a per-capita basis as the project adds a housing development that would require residents to travel longer-than-average distances to meet their daily needs. Future project residents are expected to generate approximately 35.5 vehicle miles of travel per resident per day, which is substantially higher than the existing City-wide average (21.1) or County-wide average (16.1). Based on OPR and CCTA guidance this would be considered a ***significant adverse impact.***

> ***Mitigation Measure 1: Prepare and Implement Residential Travel Demand Management (TDM Plan) -*** Prior to issuance of residential building permits, the project applicant shall develop a TDM Plan for the residential components of the proposed project, including any anticipated phasing, and shall submit the TDM Plan to the City for review and approval. The TDM Plan shall identify trip reduction strategies as well as mechanisms for funding and overseeing the delivery of trip reduction programs and strategies. Trip reduction strategies applicable to the residential portions of the proposed project may include, but are not limited to, the following:

a. Increase Transit Accessibility
b. Provide Traffic Calming Measures
c. Provide Carpooling Programs
d. Implement Car-Sharing Program
e. Provide a Transit Riders Guide
f. Provide an Online TDM Information Center

g. Increase Bicycle and Pedestrian Facilities/Amenities
h. Free Trial Rides on Transit Services
i. Implement a Subsidized or Discounted Transit Program

Level of Significance after Mitigation – Significant and Unavoidable – While the implementation of a robust TDM program will likely reduce the amount of residential VMT associated with the project, the magnitude of the reduction is unlikely to reduce the impact to a less than significant level based on the available evidence.

Impact Statement 2: Home-Work Project Generated VMT – Project Employees

The results of the VMT analysis indicate that the project would contribute to an increase in home-work vehicle miles of travel on a per-capita basis as the project adds an employment-generating use that would require employees to travel longer-than-average distances to meet their daily needs. Future project employees are expected to generate approximately 23.2 home-work vehicle miles of travel per employee per day, which is substantially higher than the existing Citywide or regional averages. Based on OPR and CCTA guidance this would be considered a ***significant adverse impact.***

Mitigation Measure 2 - Prepare and Implement Employer Travel Demand Management (TDM Plan) - Prior to issuance of building permits for the assisted living facility, the project applicant shall develop a TDM Plan for this component of the proposed project, including any anticipated phasing, and shall submit the TDM Plan to the City for review and approval. The TDM Plan shall identify trip reduction strategies as well as mechanisms for funding and overseeing the delivery of trip reduction programs and strategies. Trip reduction strategies applicable to the employment portions of the proposed project may include, but are not limited to, the following:

a. Provide Bicycle Maintenance Facilities
b. Price and Unbundle Parking
c. Provide Carpooling Programs
d. Implement Car-Sharing Program
e. Implement Loaner Bike Program
f. Provide a Transit Riders Guide
g. Provide a Dedicated Transportation Coordinator
h. Provide an Online TDM Information Center
i. Increase Bicycle and Pedestrian Facilities/Amenities
j. Increase Transit Accessibility
k. Provide Secure and Accessible Bike Parking
l. Free Trial Rides on Transit Services

m. Implement a Subsidized or Discounted Transit Program

Level of Significance after Mitigation – Significant and Unavoidable – While the implementation of a robust TDM program will likely reduce the amount of employment VMT associated with the project, the magnitude of the reduction is unlikely to reduce the impact to a less than significant level based on the available evidence.

Pedestrian System Impacts

The Project would create a significant impact related to the pedestrian system if any of the following criteria are met:

- Disrupt existing pedestrian facilities; or
- Interfere with planned pedestrian facilities; or
- Create inconsistencies with adopted pedestrian system plans, guidelines, policies, or standards.

Several internal roadways are proposed within the project site, with sidewalks of varying width providing a sidewalk network throughout. A network of trails is also proposed through the project site, connecting sidewalk facilities with parks and open space. Pedestrian access is not currently provided in the area, such that pedestrian access in the area is not expected to be disrupted during the project construction phase. The project would construct pedestrian facilities along all roadways within the project site, with sidewalks constructed to meet City of Antioch standards, completing the sidewalk network in this area.

Impact Statement 3: Pedestrian Facility Design

Pedestrian crossings at key intersections and trail connections within the project site are not currently detailed. Failure to provide adequate treatments at pedestrian crossings could create unsafe pedestrian conditions and would be inconsistent with City Standard Details. This would result in a ***significant adverse impact***.

Mitigation Measure 3- Provide Internal Site Pedestrian Treatments - The project shall provide City-standard ADA ramps at all internal roadway intersections. Pedestrian paths should be identified and marked crosswalks installed at key uncontrolled pedestrian crossing locations, such as trail crossings and park connections. The project shall install all-way stop control and high visibility pedestrian crosswalks at the intersection of A Street and C Street. Install city standard sidewalks on A Street connecting the project site to Hillcrest Avenue.

Level of Significance after Mitigation – Less Than Significant – The implementation of this mitigation measure would reduce this potential impact to a less than significant level.

Bicycle System Impacts

The Project would create a significant impact related to the bicycle system if any of the following criteria are met:

- Disrupt existing bicycle facilities; or
- Interfere with planned bicycle facilities; or
- Create inconsistencies with adopted bicycle system plans, guidelines, policies, or standards.

The project proposes to construct internal roadways with travel lanes 10 feet in width, adjacent to eight feet wide on-street parking. While the project does not propose any designated bicycle facilities (lanes, routes, or paths), bicycles would be permitted on all internal roadways. Bicycle access is not currently provided in the area, such that bicycle access in the area is not expected to be disrupted during the project construction phase. The project proposes no features that would be hazardous to bicycle travel and does not conflict with any bicycle facilities plans or programs. The current site plans do not show any designated bicycle parking for the assisted living or retail portions of the project. The City of Antioch’s Code of Ordinances (Section 9-5.1707) requires a one bicycle parking space for every 25 off-street vehicle parking spaces required, for commercial, retail, wholesale, and industrial uses.

Improvement Recommendation #6 – Provide Secure Bicycle Parking – Provide bike parking in accordance with city code for retail and assisted living portions of the project.

Transit System Impacts

The Project would create a significant impact related to transit service if the following criteria are met:

- The project interferes with existing transit facilities or precludes the construction of planned transit facilities.

The project proposes no features which conflict with existing or planned transit services. The project is not expected to result in increases in ridership on local or regional transit facilities that would exceed their capacity. Significant adverse project impacts related to transit were not identified.

Emergency Vehicle Access Impacts

The project would create a significant impact related to emergency vehicle access if the following criterion is met:

- The Project incorporates design features that limit or result in inadequate emergency vehicle access.

Several factors determine whether a project has sufficient access for emergency vehicles, including:

1. Number of access points (both public and emergency access only)
2. Width of access points
3. Width of internal roadways

The project site proposes two routes for emergency vehicle access. The first would be the connection of A Street to Hillcrest Avenue on the eastern side of the project site (i.e., the same route private vehicles would access the project site. A second Emergency Vehicle Access (EVA) route only would be provided from the western side of the site connecting Loop Street South to Deer Valley Road. This route would be accessible to emergency vehicles only and locked via bollards.

> **Improvement Recommendation #7** – Fire Marshall Site Plan Review – site plans for the various components of the project shall be reviewed and approved by the local Fire Marshall to verify adequate emergency vehicle access in accordance with state and local requirements.

Vehicular Circulation/Hazardous Features

The project would create a significant impact related to vehicular circulation and hazardous features if the following criterion is met:

- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The project's internal circulation system for vehicles is illustrated on Figure 2a and 2b. In general, the project proposes a connected system of internal roadways with travel lanes 10 feet in width, adjacent to eight feet wide on-street parking.

Access to the assisted living portion of the project would be provided by a new driveway(s) on Deer Valley Road. The location and configuration of this access is not currently defined or designed. As Deer Valley Road is a narrow two-lane rural roadway adjacent to the project site the following improvement measure is recommended:

<u>Improvement Recommendation #8</u> – Deer Valley Road/Assisted Living Facility Driveway Design – Design this intersection in accordance with city standards and ensure that adequate sight distance is provided for all movements. Provide a stop sign and stop markings for vehicles exiting the project site. Provide acceleration and deceleration lanes on Deer Valley Road for vehicles entering and exiting the project's driveway. At a minimum the dimensions illustrated within the Caltrans Highway Design Manual Figure 405.7 shall be provided.

Summary of Findings

This report presents the analysis and findings of the Transportation Impact Assessment (TIA) prepared for the proposed Albers Ranch Project located in the City of Antioch, California. The project proposes a residential living development containing up to 300 single-family homes, a 150-bed assisted living facility, and up to 40,000 square feet of neighborhood-serving retail. The project would take primary access from roadways constructed as part of the Promenade and Creekside neighborhoods of the Vineyards at Sand Creek project. As such, buildout of these neighborhoods was assumed as part of this analysis. The assisted living and neighborhood retail components of the Project would be provided access via a new driveway(s) on Deer Valley Road. The location and configuration of this access is not currently defined or designed. Further details regarding analysis assumptions by study scenario are provided in the "Analysis Scenarios" section of this report.

The project was found to generate approximately 4,732 daily vehicle trips with roughly 288 trips occurring during the morning peak hour and approximately 488 occurring in the afternoon peak hour. To evaluate compliance with the City of Antioch General Plan requirements, traffic operations were assessed at eleven intersections surrounding the project site providing key points of access. Intersection operations were evaluated under Existing, Near Term and Cumulative conditions both with and without project traffic. Four freeway segments along State Route 4 within the project vicinity were also evaluated under the same scenarios. In addition, an environmental assessment of the project's effects on vehicle miles traveled, pedestrian facilities, bicycle facilities, transit facilities, emergency vehicle access, and vehicular circulation/hazardous features was conducted.

Improvement Recommendations

Based on the findings and conclusions of the analysis, the following recommendations are made to provide for adequate and efficient operations across all modes of travel.

> **Improvement Recommendation #1** – The project applicant shall pay their fair share towards freeway improvement projects in the area, including the widening of State Route 4 between Balfour Road and Marsh Creek Road through the payment of the regional transportation impact fees to the East Contra Costa Regional Fee and Financing Authority (ECCRFFA).

> **Improvement Recommendation #2** – Lone Tree Way at Hillcrest Avenue - Implement improvements that would improve operations to LOS D within the existing right-of-way, which could include modifying the eastbound approach to provide two left-turn lanes, two through lanes and a through-right-shared lane through the reconstruction of the median, restriping, and signal

modifications. The outside curbs may need to be modified to provide for appropriate lane-alignments. A reimbursement agreement could be established with the City of Antioch to collect proportionate shares from other developments that would benefit from this improvement.

Improvement Recommendation #3 – Sand Creek Road at SR 4 Eastbound Ramps - The project should pay their proportionate share of the improvements that would improve operations through participation in the ECCRFFA regional fee program. Planned improvements include construction of a slip-ramp for the eastbound Sand Creek to southbound State Route 4 movement, eliminating the conflicting left-turn movement at the intersection.

Improvement Recommendation #4 – Sand Creek Road at SR4 Westbound Ramps - The project should pay their proportionate share of improvements that would provide acceptable operations or participate in the ECCRFFA regional fee program if improvements that would result in acceptable operations at this intersection are added to the fee program. Modifying the westbound approach to provide two through lanes and two right-turn only lanes would result in acceptable operations during the morning peak hour.

Improvement Recommendation #5 – Prewett Ranch Drive at Hillcrest Avenue - This intersection has been built-out to its ultimate right-of-way, and the City of Antioch has not identified any improvement measures. Construction of both a westbound and eastbound right-turn lanes would result in LOS D operations, or construction of a southbound right-turn only lane. These improvements would require right-of-way acquisition, and would increase the pedestrian crossing distance, and well as increase conflicts for bicyclists.

Improvement Recommendation #6 – Provide Secure Bicycle Parking – Provide bike parking in accordance with city code for retail and assisted living portions of the project.

Improvement Recommendation #7 – Fire Marshall Site Plan Review – site plans for the various components of the project shall be reviewed and approved by the local Fire Marshall to verify adequate emergency vehicle access in accordance with state and local requirements.

Improvement Recommendation #8 – Deer Valley Road/Assisted Living Facility Driveway Design – Design this intersection in accordance with city standards and ensure that adequate sight distance is provided for all movements. Provide a stop sign and stop markings for vehicles exiting the project site. Provide acceleration and deceleration lanes on Deer Valley Road for vehicles entering and exiting the project's driveway. At a minimum the dimensions illustrated within the Caltrans Highway Design Manual Figure 405.7 shall be provided.

Environmental Impacts

Environmental impact thresholds are defined in the "Significance Criteria" section at the beginning of this report. Based on the findings and conclusions of the environmental assessment, the following project-related environmental impacts were identified. Each impact and its level of significance after mitigation is described below.

Impact Statement 1: Home-Based Project Generated VMT – Project Residents

The results of the VMT analysis indicate that the project would contribute to an increase in home-based vehicle miles of travel on a per-capita basis as the project adds a housing development that would require residents to travel longer-than-average distances to meet their daily needs. Future project residents are expected to generate approximately 35.5 vehicle miles of travel per resident per day, which is substantially higher than the existing City or County-wide averages. Based on OPR and CCTA guidance this would be considered a ***significant adverse impact.***

> ***Mitigation Measure 1: Prepare and Implement Residential Travel Demand Management (TDM Plan) -*** Prior to issuance of residential building permits, the project applicant shall develop a TDM Plan for the residential components of the proposed project, including any anticipated phasing, and shall submit the TDM Plan to the City for review and approval. The TDM Plan shall identify trip reduction strategies as well as mechanisms for funding and overseeing the delivery of trip reduction programs and strategies.
>
> ***Level of Significance after Mitigation – Significant and Unavoidable*** – While the implementation of a robust TDM program will likely reduce the amount of residential VMT associated with the project, the magnitude of the reduction is unlikely to reduce the impact to a less than significant level based on the available evidence.

Impact Statement 2: Home-Work Project Generated VMT – Project Employees

The results of the VMT analysis indicate that the project would contribute to an increase in home-work vehicle miles of travel on a per-capita basis as the project adds an employment-generating use that would require employees to travel longer-than-average distances to meet their daily needs. Future project employees are expected to generate approximately 23.2 home-work vehicle miles of travel per employee per day, which is substantially higher than the existing Citywide or regional averages. Based on OPR and CCTA guidance this would be considered a ***significant adverse impact.***

> ***Mitigation Measure 2 - Prepare and Implement Employer Travel Demand Management (TDM Plan) -*** Prior to issuance of building permits for the assisted living facility, the project applicant shall

develop a TDM Plan for this component of the proposed project, including any anticipated phasing, and shall submit the TDM Plan to the City for review and approval. The TDM Plan shall identify trip reduction strategies as well as mechanisms for funding and overseeing the delivery of trip reduction programs and strategies.

Level of Significance after Mitigation – Significant and Unavoidable – While the implementation of a robust TDM program will likely reduce the amount of employment VMT associated with the project, the magnitude of the reduction is unlikely to reduce the impact to a less than significant level based on the available evidence.

Impact Statement 3: Pedestrian Facility Design

Pedestrian crossings at key intersections and trail connections within the project site are not currently detailed. Failure to provide adequate treatments at pedestrian crossings could create unsafe pedestrian conditions and would be inconsistent with City Standard Details. This would result in a ***significant adverse impact***.

Mitigation Measure 3- Provide Internal Site Pedestrian Treatments - The project shall provide City-standard ADA ramps at all internal roadway intersections. Pedestrian paths should be identified and marked crosswalks installed at key uncontrolled pedestrian crossing locations, such as trail crossings and park connections. The project shall install all-way stop control and high visibility pedestrian crosswalks at the intersection of A Street and C Street. Install city standard sidewalks on A Street connecting the project site to Hillcrest Avenue.

Level of Significance after Mitigation – Less Than Significant – The implementation of this mitigation measure would reduce this potential impact to a less than significant level.

APPENDIX A: TRAFFIC COUNTS

National Data & Surveying Services

Intersection Turning Movement Count

Location: Hillcrest Ave & Lone Tree Way
City: Antioch
Control: Signalized

Project ID: 19-08022-001
Date: 1/29/2019

Total

NS/EW Streets:	Hillcrest Ave				Hillcrest Ave				Lone Tree Way				Lone Tree Way				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	2	2	1	0	1	2	1	0	1	3	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	4	9	3	0	20	3	9	1	8	37	1	0	2	45	3	0	145
6:15 AM	3	11	2	0	28	2	8	3	5	37	2	2	1	61	2	0	167
6:30 AM	8	4	1	0	41	5	8	6	5	50	2	2	0	76	11	0	219
6:45 AM	4	6	2	0	42	4	13	7	6	48	0	2	1	105	11	0	251
7:00 AM	2	5	6	0	36	9	9	8	6	57	0	0	6	85	13	0	242
7:15 AM	5	10	4	0	40	12	23	9	14	70	1	0	0	117	18	0	323
7:30 AM	9	13	4	0	45	11	79	4	26	114	6	1	12	176	29	0	529
7:45 AM	16	18	3	0	74	24	41	12	51	159	1	5	5	223	33	0	665
8:00 AM	4	14	4	0	59	11	39	17	38	124	5	5	5	173	37	0	535
8:15 AM	6	10	9	0	58	19	38	20	24	121	1	3	7	203	41	0	560
8:30 AM	9	12	5	0	48	21	72	16	24	109	0	1	12	211	32	0	572
8:45 AM	7	12	16	0	57	9	63	18	49	133	2	2	5	186	24	0	583
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	77	124	59	0	548	130	402	121	256	1059	21	23	56	1661	254	0	4791
APPROACH %'s :	29.62%	47.69%	22.69%	0.00%	45.63%	10.82%	33.47%	10.07%	18.84%	77.92%	1.55%	1.69%	2.84%	84.27%	12.89%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	35	54	21	0	239	75	190	65	137	513	7	14	29	810	143	0	2332
PEAK HR FACTOR :	0.547	0.750	0.583	0.000	0.807	0.781	0.660	0.813	0.672	0.807	0.350	0.700	0.604	0.908	0.872	0.000	0.877
	0.743				0.906				0.777				0.941				

	Hillcrest Ave				Hillcrest Ave				Lone Tree Way				Lone Tree Way				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	2	2	1	0	1	2	1	0	1	3	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	8	13	13	1	105	24	39	24	106	242	11	1	12	220	48	0	867
3:15 PM	6	13	11	0	90	19	17	30	61	217	4	2	15	211	46	1	743
3:30 PM	9	18	9	0	73	17	29	23	37	221	9	4	15	216	49	0	729
3:45 PM	6	10	12	0	77	23	12	40	36	197	4	5	15	238	60	0	735
4:00 PM	5	12	13	0	74	18	20	25	32	190	4	3	14	203	51	0	664
4:15 PM	8	14	7	0	70	19	15	31	26	173	10	1	12	179	52	1	618
4:30 PM	8	15	8	0	96	17	24	43	35	203	1	1	16	227	54	1	749
4:45 PM	10	10	15	0	94	18	19	37	41	196	2	5	22	220	50	0	739
5:00 PM	8	9	9	0	86	28	23	31	35	212	3	1	15	207	59	0	726
5:15 PM	4	13	4	0	87	22	30	39	47	208	9	3	15	197	60	0	738
5:30 PM	9	7	4	0	84	16	29	38	52	231	5	2	10	191	63	2	743
5:45 PM	7	13	8	0	69	23	38	40	39	181	9	3	18	186	60	0	694
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	88	147	113	1	1005	244	295	401	547	2471	71	31	179	2495	652	5	8745
APPROACH %'s :	25.21%	42.12%	32.38%	0.29%	51.67%	12.54%	15.17%	20.62%	17.53%	79.20%	2.28%	0.99%	5.37%	74.90%	19.57%	0.15%	
PEAK HR :	03:00 PM - 04:00 PM																TOTAL
PEAK HR VOL :	29	54	45	1	345	83	97	117	240	877	28	12	57	885	203	1	3074
PEAK HR FACTOR :	0.806	0.750	0.865	0.250	0.821	0.865	0.622	0.731	0.566	0.906	0.636	0.600	0.950	0.930	0.846	0.250	0.886
	0.896				0.836				0.803				0.915				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Heidorn Ranch Rd & Lone Tree Way
City: Antioch
Control: Signalized

Project ID: 19-08022-002
Date: 1/29/2019

Total

NS/EW Streets:	Heidorn Ranch Rd				Heidorn Ranch Rd				Lone Tree Way				Lone Tree Way				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	1	1	0	1	1	0	0	1	3	0	0	1	3	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	1	2	0	0	0	0	0	0	98	4	0	5	55	0	0	165
6:15 AM	3	0	0	0	3	0	0	0	0	108	3	0	2	66	0	1	186
6:30 AM	4	0	1	0	3	1	1	0	0	124	4	0	18	92	0	0	248
6:45 AM	2	1	2	0	3	0	1	0	0	145	6	0	16	126	1	0	303
7:00 AM	2	0	1	0	5	2	1	0	1	132	3	0	12	110	0	0	269
7:15 AM	4	1	3	0	4	0	2	0	0	156	7	0	9	146	1	0	333
7:30 AM	3	1	5	0	5	0	1	0	1	212	6	0	11	206	6	0	457
7:45 AM	3	0	4	0	7	0	1	0	0	303	6	0	12	283	3	0	622
8:00 AM	4	0	9	0	5	0	0	0	1	240	9	0	12	249	5	1	535
8:15 AM	17	0	28	0	2	0	0	0	0	185	31	0	23	282	3	0	571
8:30 AM	13	0	17	0	3	0	0	0	1	186	15	0	10	284	2	0	531
8:45 AM	12	2	7	0	2	0	1	0	1	218	17	0	14	217	2	1	494
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	67	6	79	0	42	3	8	0	5	2107	111	0	144	2116	23	3	4714
APPROACH %'s :	44.08%	3.95%	51.97%	0.00%	79.25%	5.66%	15.09%	0.00%	0.22%	94.78%	4.99%	0.00%	6.30%	92.56%	1.01%	0.13%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	37	0	58	0	17	0	1	0	2	914	61	0	57	1098	13	1	2259
PEAK HR FACTOR :	0.544	0.000	0.518	0.000	0.607	0.000	0.250	0.000	0.500	0.754	0.492	0.000	0.620	0.967	0.650	0.250	0.908
	0.528				0.563				0.790				0.949				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	1	1	0	1	1	0	0	1	3	0	0	1	3	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	33	2	20	0	2	0	1	0	3	359	33	0	18	266	11	3	751
3:15 PM	28	0	36	0	3	0	3	0	0	351	32	0	25	293	9	4	784
3:30 PM	46	2	47	0	1	1	1	0	3	298	26	0	20	316	5	1	767
3:45 PM	41	0	26	0	7	1	2	0	4	323	32	0	18	319	12	1	786
4:00 PM	30	1	23	0	7	1	2	0	2	304	23	1	20	265	8	6	693
4:15 PM	36	1	22	0	8	2	2	0	0	312	17	0	15	303	7	3	728
4:30 PM	30	1	22	0	5	1	2	0	1	335	16	0	22	290	9	1	735
4:45 PM	29	0	24	0	8	0	1	0	1	346	23	0	16	301	3	0	752
5:00 PM	44	2	15	0	4	2	1	0	2	364	23	1	12	287	5	4	766
5:15 PM	36	1	22	0	12	1	4	0	2	324	27	0	10	287	6	3	735
5:30 PM	40	2	20	0	4	3	1	0	2	312	20	0	12	266	5	6	693
5:45 PM	25	3	22	0	7	2	1	0	3	284	27	0	10	293	9	4	690
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	418	15	299	0	68	14	21	0	23	3912	299	2	198	3486	89	36	8880
APPROACH %'s :	57.10%	2.05%	40.85%	0.00%	66.02%	13.59%	20.39%	0.00%	0.54%	92.35%	7.06%	0.05%	5.20%	91.52%	2.34%	0.95%	
PEAK HR :	03:00 PM - 04:00 PM																TOTAL
PEAK HR VOL :	148	4	129	0	13	2	7	0	10	1331	123	0	81	1194	37	9	3088
PEAK HR FACTOR :	0.804	0.500	0.686	0.000	0.464	0.500	0.583	0.000	0.625	0.927	0.932	0.000	0.810	0.936	0.771	0.563	0.982
	0.739				0.550				0.927				0.944				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Deer Valley Rd & Sand Creek Rd
City: Antioch
Control: Signalized

Project ID: 19-08022-003
Date: 1/29/2019

Total

NS/EW Streets:	Deer Valley Rd				Deer Valley Rd				Sand Creek Rd				Sand Creek Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0.5	0.5	0	1	0.5	0.5	0	0	1	0	0	0.5	0.5	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	10	1	0	5	27	1	0	0	0	0	0	0	0	1	0	45
6:15 AM	0	7	6	0	1	32	0	0	0	0	0	0	1	0	0	0	47
6:30 AM	0	13	7	0	13	54	0	0	0	0	0	0	2	0	1	0	90
6:45 AM	0	24	30	0	13	53	0	0	0	0	0	0	1	0	4	0	125
7:00 AM	0	27	2	0	18	60	0	0	0	0	0	0	2	0	11	0	120
7:15 AM	0	52	5	0	44	109	0	0	0	0	0	0	4	0	19	0	233
7:30 AM	0	59	14	0	128	102	0	2	0	0	0	0	15	0	84	0	404
7:45 AM	0	89	7	0	71	112	0	0	1	0	0	0	3	0	108	0	391
8:00 AM	0	93	7	0	34	59	1	0	0	1	0	0	5	1	76	0	277
8:15 AM	0	123	22	0	45	37	0	1	0	0	0	0	2	0	30	0	260
8:30 AM	0	50	14	0	109	43	0	0	0	0	0	0	5	0	63	0	284
8:45 AM	0	59	9	0	33	39	0	0	0	0	0	0	4	0	50	0	194
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	606	124	0	514	727	2	3	1	1	0	0	44	1	447	0	2470
APPROACH %'s :	0.00%	83.01%	16.99%	0.00%	41.25%	58.35%	0.16%	0.24%	50.00%	50.00%	0.00%	0.00%	8.94%	0.20%	90.85%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	364	50	0	278	310	1	3	1	1	0	0	25	1	298	0	1332
PEAK HR FACTOR :	0.000	0.740	0.568	0.000	0.543	0.692	0.250	0.375	0.250	0.250	0.000	0.000	0.417	0.250	0.690	0.000	0.824
	0.714				0.638				0.500				0.730				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0.5	0.5	0	1	0.5	0.5	0	0	1	0	0	0.5	0.5	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	0	94	13	0	38	90	0	6	0	0	0	0	16	0	74	0	331
3:15 PM	0	132	14	0	23	86	0	1	0	0	0	0	13	0	35	0	304
3:30 PM	0	97	10	0	16	68	0	1	0	0	0	0	27	0	30	0	249
3:45 PM	0	89	12	0	13	58	0	0	0	0	0	0	13	0	31	0	216
4:00 PM	0	57	10	0	10	67	0	1	1	0	0	0	21	0	29	0	196
4:15 PM	0	67	8	0	4	54	0	0	1	0	0	0	15	0	12	0	161
4:30 PM	0	65	7	0	6	76	0	0	2	0	0	0	24	0	7	0	187
4:45 PM	0	65	11	0	3	68	0	0	0	0	0	0	13	0	8	0	168
5:00 PM	0	74	3	0	4	67	0	0	0	0	0	0	23	0	13	0	184
5:15 PM	0	60	4	0	6	70	0	0	1	0	0	0	18	0	7	0	166
5:30 PM	0	58	4	0	4	68	0	0	0	0	0	0	11	0	8	0	153
5:45 PM	0	52	2	0	2	45	1	0	1	0	0	0	4	0	1	0	108
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	910	98	0	129	817	1	9	6	0	0	0	198	0	255	0	2423
APPROACH %'s :	0.00%	90.28%	9.72%	0.00%	13.49%	85.46%	0.10%	0.94%	100.00%	0.00%	0.00%	0.00%	43.71%	0.00%	56.29%	0.00%	
PEAK HR :	03:00 PM - 04:00 PM																TOTAL
PEAK HR VOL :	0	412	49	0	90	302	0	8	0	0	0	0	69	0	170	0	1100
PEAK HR FACTOR :	0.000	0.780	0.875	0.000	0.592	0.839	0.000	0.333	0.000	0.000	0.000	0.000	0.639	0.000	0.574	0.000	0.831
	0.789				0.746								0.664				

National Data & Surveying Services Intersection Turning Movement Count

Location: SR 4 EB Ramps & Sand Creek Rd
City: Brentwood
Control: Signalized

Project ID: 19-08008-014
Date: 1/24/2019

Total

NS/EW Streets:	SR 4 EB Ramps				SR 4 EB Ramps				Sand Creek Rd				Sand Creek Rd				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
AM	0	0	0	0	2	0	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	25	0	0	0	0	0	0	0	0	0	25	0	50
6:15 AM	0	0	0	0	35	0	1	0	0	0	0	0	0	0	22	0	58
6:30 AM	0	0	0	0	61	0	0	0	0	0	0	0	0	0	36	0	97
6:45 AM	0	0	0	0	89	0	0	0	0	0	0	0	0	0	34	1	124
7:00 AM	0	0	0	0	101	0	0	0	1	0	0	0	0	0	61	0	163
7:15 AM	0	0	0	0	136	0	1	0	0	1	0	0	0	0	99	0	237
7:30 AM	0	0	0	0	170	0	0	0	0	0	0	0	0	0	78	1	249
7:45 AM	0	0	0	0	258	0	0	0	0	0	0	0	0	0	84	0	342
8:00 AM	0	0	0	0	188	0	0	0	0	0	0	0	0	0	52	0	240
8:15 AM	0	0	0	0	174	0	0	0	0	0	0	0	0	0	47	0	221
8:30 AM	0	0	0	0	168	0	0	0	0	0	0	0	0	0	44	0	212
8:45 AM	0	0	0	0	165	0	0	0	0	0	0	0	0	0	43	0	208
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1570	0	2	0	1	1	0	0	0	0	625	2	2201
APPROACH %'s :					99.87%	0.00%	0.13%	0.00%	50.00%	50.00%	0.00%	0.00%	0.00%	0.00%	99.68%	0.32%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	0	0	0	0	752	0	1	0	0	1	0	0	0	0	313	1	1068
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.729	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.790	0.250	0.781
					0.730				0.250				0.793				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	0	0	0	2	0	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	0	0	0	0	272	0	0	0	0	0	0	0	0	0	53	1	326
3:15 PM	0	0	0	0	273	0	0	0	0	0	0	0	0	0	35	0	308
3:30 PM	0	0	0	0	306	0	0	0	0	0	0	0	0	0	29	0	335
3:45 PM	0	0	0	0	262	0	0	0	0	0	0	0	0	0	39	0	301
4:00 PM	0	0	0	0	300	0	0	0	0	0	0	0	0	0	39	1	340
4:15 PM	0	0	0	0	279	0	0	0	0	0	0	0	0	0	27	0	306
4:30 PM	0	0	0	0	310	0	0	0	0	0	0	0	0	0	28	2	340
4:45 PM	0	0	0	0	301	0	0	0	0	0	0	0	0	0	25	2	328
5:00 PM	0	0	0	0	322	0	0	0	0	0	0	0	0	0	42	0	364
5:15 PM	0	0	0	0	335	0	0	0	0	0	0	0	0	0	30	0	365
5:30 PM	0	0	0	0	329	0	0	0	0	0	0	0	0	0	33	0	362
5:45 PM	0	0	0	0	301	0	0	0	0	0	0	0	0	0	42	0	343
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	3590	0	0	0	0	0	0	0	0	0	422	6	4018
APPROACH %'s :					100.00%	0.00%	0.00%	0.00%					0.00%	0.00%	98.60%	1.40%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	1287	0	0	0	0	0	0	0	0	0	147	0	1434
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.960	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.875	0.000	0.982
					0.960								0.875				

National Data & Surveying Services Intersection Turning Movement Count

Location: SR 4 WB Ramps & Sand Creek Rd
City: Brentwood
Control: Signalized

Project ID: 19-08008-015
Date: 1/24/2019

Total

NS/EW Streets:	SR 4 WB Ramps				SR 4 WB Ramps				Sand Creek Rd				Sand Creek Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1.5	0.5	1	0	0	0	0	0	2	3	0	0	0	1.5	1.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	1	6	0	0	0	0	0	1	22	0	0	0	24	122	0	176
6:15 AM	1	0	3	0	0	0	0	0	1	36	0	0	0	23	139	0	203
6:30 AM	0	2	9	0	0	0	0	0	0	60	0	0	0	34	163	0	268
6:45 AM	2	0	21	0	0	0	0	0	2	86	0	0	0	34	135	0	280
7:00 AM	2	0	17	0	0	0	0	0	0	106	0	0	0	59	170	0	354
7:15 AM	3	0	22	0	0	0	0	0	0	133	0	0	0	95	208	0	461
7:30 AM	6	0	38	0	0	0	0	0	1	171	0	0	0	78	210	0	504
7:45 AM	3	1	42	0	0	0	0	0	1	255	0	0	0	76	220	0	598
8:00 AM	4	0	30	0	0	0	0	0	1	189	0	0	0	51	233	0	508
8:15 AM	3	2	26	0	0	0	0	0	3	168	0	0	0	42	284	0	528
8:30 AM	7	1	22	0	0	0	0	0	1	161	0	1	0	36	187	0	416
8:45 AM	4	1	31	0	0	0	0	0	1	170	0	1	0	37	178	0	423
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	35	8	267	0	0	0	0	0	12	1557	0	2	0	589	2249	0	4719
APPROACH %'s :	11.29%	2.58%	86.13%	0.00%					0.76%	99.11%	0.00%	0.13%	0.00%	20.75%	79.25%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	16	3	136	0	0	0	0	0	6	783	0	0	0	247	947	0	2138
PEAK HR FACTOR :	0.667	0.375	0.810	0.000	0.000	0.000	0.000	0.000	0.500	0.768	0.000	0.000	0.000	0.792	0.834	0.000	0.894
	0.842								0.771				0.916				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1.5	0.5	1	0	0	0	0	0	2	3	0	0	0	1.5	1.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	6	0	69	0	0	0	0	0	0	274	0	0	0	49	226	0	624
3:15 PM	3	4	60	0	0	0	0	0	3	273	0	0	0	29	249	0	621
3:30 PM	0	0	42	0	0	0	0	0	4	300	0	0	0	31	257	0	634
3:45 PM	1	3	44	0	0	0	0	0	4	262	0	0	0	37	218	0	569
4:00 PM	2	0	32	0	0	0	0	0	3	292	0	1	0	36	223	0	589
4:15 PM	1	0	47	0	0	0	0	0	0	282	0	0	0	30	200	0	560
4:30 PM	1	1	43	0	0	0	0	0	4	299	0	0	0	31	213	0	592
4:45 PM	1	0	54	0	0	0	0	0	3	297	0	0	0	29	194	0	578
5:00 PM	1	0	56	0	0	0	0	0	3	326	0	0	0	36	245	0	667
5:15 PM	1	2	50	0	0	0	0	0	3	328	0	0	0	29	209	0	622
5:30 PM	1	1	46	0	0	0	0	0	1	329	0	0	0	33	222	0	633
5:45 PM	1	2	44	0	0	0	0	0	3	301	0	0	0	40	226	0	617
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	19	13	587	0	0	0	0	0	31	3563	0	1	0	410	2682	0	7306
APPROACH %'s :	3.07%	2.10%	94.83%	0.00%					0.86%	99.11%	0.00%	0.03%	0.00%	13.26%	86.74%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	4	5	196	0	0	0	0	0	10	1284	0	0	0	138	902	0	2539
PEAK HR FACTOR :	1.000	0.625	0.875	0.000	0.000	0.000	0.000	0.000	0.833	0.976	0.000	0.000	0.000	0.863	0.920	0.000	0.952
	0.899								0.977				0.925				

Prepared by National Data & Surveying Services

Hillcrest Ave & Prewett Ranch Dr

Peak Hour Turning Movement Count

ID: 19-08404-001
City: Antioch

Day: Wednesday
Date: 08/21/2019

	PEAK HOURS	COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

Hillcrest Ave – SOUTHBOUND

	Right	Thru	Left	U-Turn	Departing
AM	140	10	5	0	199
NOON	0	0	0	0	0
PM	145	0	7	0	177
Lanes	1	0	1	0	

Prewett Ranch Dr – EASTBOUND

	AM	NOON	PM	Lanes
Departing	180	0	166	
U-Turn	0	0	0	0
Left	190	0	169	1
Thru	38	0	29	1
Right	0	0	0	0

Prewett Ranch Dr – WESTBOUND

	PM	NOON	AM	Lanes
Right	4	0	5	0
Thru	21	0	40	1
Left	1	0	1	1
U-Turn	0	0	0	0
Departing	37	0	43	

Hillcrest Ave – NORTHBOUND

	Departing	U-Turn	Left	Thru	Right
Lanes		0	1	1	0
PM	1	0	0	4	1
NOON	0	0	0	0	0
AM	13	2	0	4	0

CONTROL

Signalized

	AM	NOON	PM
TEV	435	0	381
PHF	0.86		0.94

Cars (AM)

SB: 137, 7, 5
EB: 187, 37, 0
WB: 5, 39, 1
NB: 0, 2, 0

HT (AM)

SB: 3, 3, 0
EB: 3, 1, 0
WB: 0, 1, 0
NB: 0, 2, 0

Cars (NOON)

SB: N/A, N/A, N/A
EB: N/A, N/A, N/A
WB: N/A, N/A, N/A
NB: N/A, N/A, N/A

HT (NOON)

SB: N/A, N/A, N/A
EB: N/A, N/A, N/A
WB: N/A, N/A, N/A
NB: N/A, N/A, N/A

Cars (PM)

SB: 145, 0, 7
EB: 169, 29, 0
WB: 4, 21, 1
NB: 0, 4, 1

HT (PM)

SB: 0, 0, 0
EB: 0, 0, 0
WB: 0, 0, 0
NB: 0, 0, 0

Pedestrians (Crosswalks)

	PM	NOON	AM	AM	NOON	PM
North	0	0	0	4	0	0
South	0	0	1	2	0	0

	PM	NOON	AM	AM	NOON	PM
West	0	0	0	0	0	0
East	0	0	1	0	0	0

Diagonals (PM, NOON, AM): NW 0 0 0; NE 0 0 0; SW 0 0 0; SE 0 0 0

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

File Name : 17-07654-014
Date : 08/24/2017

Unshifted Count = All Vehicles & Uturns

	Deer Valley Rd Southbound					Prewett Ranch Dr Westbound					Deer Valley Rd Northbound					Prewett Ranch Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	4	120	6	1	131	17	12	23	0	52	11	35	3	0	49	12	9	18	0	39	271	1
7:15	13	154	14	1	182	46	12	18	0	76	21	64	14	0	99	13	14	30	0	57	414	1
7:30	9	197	8	8	222	60	26	33	0	119	21	102	36	1	160	45	56	61	0	162	663	9
7:45	18	213	22	5	258	64	58	33	0	155	17	131	37	0	185	29	30	43	0	102	700	5
Total	44	684	50	15	793	187	108	107	0	402	70	332	90	1	493	99	109	152	0	360	2048	16
8:00	23	193	12	4	232	40	60	34	0	134	30	136	31	0	197	27	45	26	0	98	661	4
8:15	13	195	16	2	226	50	15	23	0	88	21	90	12	0	123	15	39	39	0	93	530	2
8:30	19	165	15	5	204	33	14	25	0	72	16	76	21	0	113	36	16	32	0	84	473	5
8:45	8	141	22	15	186	20	19	19	0	58	12	90	24	0	126	54	33	21	0	108	478	15
Total	63	694	65	26	848	143	108	101	0	352	79	392	88	0	559	132	133	118	0	383	2142	26
16:00	10	95	16	2	123	13	15	11	0	39	8	108	16	0	132	6	23	13	0	42	336	2
16:15	18	102	20	2	142	17	20	16	0	53	18	119	33	0	170	14	23	22	0	59	424	2
16:30	16	67	14	0	97	19	26	16	0	61	22	140	28	0	190	7	29	12	0	48	396	0
16:45	23	77	14	3	117	9	19	17	0	45	28	114	28	0	170	15	16	12	0	43	375	3
Total	67	341	64	7	479	58	80	60	0	198	76	481	105	0	662	42	91	59	0	192	1531	7
17:00	24	105	16	1	146	12	22	19	0	53	28	135	43	0	206	13	21	12	0	46	451	1
17:15	15	68	17	1	101	11	27	14	0	52	36	115	47	0	198	18	22	20	0	60	411	1
17:30	35	92	30	0	157	9	16	23	0	48	36	97	28	1	162	15	30	7	0	52	419	1
17:45	27	111	23	2	163	11	23	15	0	49	20	92	17	0	129	18	30	16	0	64	405	2
Total	101	376	86	4	567	43	88	71	0	202	120	439	135	1	695	64	103	55	0	222	1686	5
Grand Total	275	2095	265	52	2687	431	384	339	0	1154	345	1644	418	2	2409	337	436	384	0	1157	7407	54
Apprch %	10.2%	78.0%	9.9%	1.9%		37.3%	33.3%	29.4%	0.0%		14.3%	68.2%	17.4%	0.1%		29.1%	37.7%	33.2%	0.0%			
Total %	3.7%	28.3%	3.6%	0.7%	36.3%	5.8%	5.2%	4.6%	0.0%	15.6%	4.7%	22.2%	5.6%	0.0%	32.5%	4.5%	5.9%	5.2%	0.0%	15.6%	100.0%	

AM PEAK HOUR	Deer Valley Rd Southbound					Prewett Ranch Dr Westbound					Deer Valley Rd Northbound					Prewett Ranch Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	9	197	8	8	222	60	26	33	0	119	21	102	36	1	160	45	56	61	0	162	663
7:45	18	213	22	5	258	64	58	33	0	155	17	131	37	0	185	29	30	43	0	102	700
8:00	23	193	12	4	232	40	60	34	0	134	30	136	31	0	197	27	45	26	0	98	661
8:15	13	195	16	2	226	50	15	23	0	88	21	90	12	0	123	15	39	39	0	93	530
Total Volume	63	798	58	19	938	214	159	123	0	496	89	459	116	1	665	116	170	169	0	455	2554
% App Total	6.7%	85.1%	6.2%	2.0%		43.1%	32.1%	24.8%	0.0%		13.4%	69.0%	17.4%	0.2%		25.5%	37.4%	37.1%	0.0%		
PHF	.685	.937	.659	.594	.909	.836	.663	.904	.000	.800	.742	.844	.784	.250	.844	.644	.759	.693	.000	.702	.912

PM PEAK HOUR	Deer Valley Rd Southbound					Prewett Ranch Dr Westbound					Deer Valley Rd Northbound					Prewett Ranch Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	24	105	16	1	146	12	22	19	0	53	28	135	43	0	206	13	21	12	0	46	451
17:15	15	68	17	1	101	11	27	14	0	52	36	115	47	0	198	18	22	20	0	60	411
17:30	35	92	30	0	157	9	16	23	0	48	36	97	28	1	162	15	30	7	0	52	419
17:45	27	111	23	2	163	11	23	15	0	49	20	92	17	0	129	18	30	16	0	64	405
Total Volume	101	376	86	4	567	43	88	71	0	202	120	439	135	1	695	64	103	55	0	222	1686
% App Total	17.8%	66.3%	15.2%	0.7%		21.3%	43.6%	35.1%	0.0%		17.3%	63.2%	19.4%	0.1%		28.8%	46.4%	24.8%	0.0%		
PHF	.721	.847	.717	.500	.870	.896	.815	.772	.000	.953	.833	.813	.718	.250	.843	.889	.858	.688	.000	.867	.935

Prepared by National Data & Surveying Services

Deer Valley Rd & Lone Tree Way

Peak Hour Turning Movement Count

ID: 19-08166-005
City: Antioch

Day: Tuesday
Date: 04/02/2019

	PEAK HOURS	COUNT PERIODS
AM	07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Deer Valley Rd — SOUTHBOUND

	↲	↓	↳	U	⇧
AM	18	428	278	3	481
NOON	0	0	0	0	0
PM	23	274	223	5	542
	0	2	2	0	

Lone Tree Way — EASTBOUND

	AM	NOON	PM	
⇦	855	0	782	
U	2	0	3	0
↱	32	0	67	1
→	597	0	714	2
↴	195	0	126	1

CONTROL

Signalized

	AM	NOON	PM
TEV	3111	0	2967
PHF	0.85		0.95

Lone Tree Way — WESTBOUND

		PM	NOON	AM
1	↰	191	0	217
2	←	587	0	609
1	↙	136	0	169
0	U	15	0	16
	⇨	1094	0	975

Deer Valley Rd — NORTHBOUND

	⇩	U	↰	↑	↱
		0	2	2	0
PM	549	13	169	279	142
NOON	0	0	0	0	0
AM	800	8	226	229	84

Cars (AM)

	Left	Thru	Right
Southbound	273	421	18
Eastbound	32	587	194
Westbound	165	593	213
Northbound	224	227	83

HT (AM)

	Left	Thru	Right
Southbound	5	7	0
Eastbound	0	10	1
Westbound	4	16	4
Northbound	2	2	1

Cars (NOON)

	Left	Thru	Right
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

HT (NOON)

	Left	Thru	Right
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Cars (PM)

	Left	Thru	Right
Southbound	220	270	23
Eastbound	67	711	126
Westbound	136	584	190
Northbound	168	278	142

HT (PM)

	Left	Thru	Right
Southbound	3	4	0
Eastbound	0	3	0
Westbound	0	3	1
Northbound	1	1	0

Pedestrians (Crosswalks)

	PM	NOON	AM	AM	NOON	PM
North crosswalk (→ / ←)	0	0	2	0	0	3
South crosswalk (→ / ←)	1	0	18	8	0	15

	PM	NOON	AM	AM	NOON	PM
West crosswalk (↓ / ↑)	0	0	6	0	0	0
East crosswalk (↓ / ↑)	4	0	8	0	0	3

Diagonal	PM	NOON	AM
Northwest	0	0	0
Northeast	0	0	0
Southwest	0	0	0
Southeast	0	0	0

APPENDIX B: LOS CALCULATION WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	513	7	29	810	143	35	54	21	304	75	190
Future Volume (veh/h)	151	513	7	29	810	143	35	54	21	304	75	190
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	170	576	2	33	910	41	39	61	24	342	84	57
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	224	2047	7	69	1546	477	77	277	103	492	741	324
Arrive On Green	0.13	0.39	0.39	0.04	0.30	0.30	0.04	0.11	0.10	0.14	0.21	0.21
Sat Flow, veh/h	1781	5253	18	1781	5106	1577	1795	2552	950	3483	3582	1567
Grp Volume(v), veh/h	170	373	205	33	910	41	39	42	43	342	84	57
Grp Sat Flow(s),veh/h/ln	1781	1702	1867	1781	1702	1577	1795	1791	1711	1742	1791	1567
Q Serve(g_s), s	4.8	3.9	3.9	0.9	7.8	1.0	1.1	1.1	1.2	4.8	1.0	1.5
Cycle Q Clear(g_c), s	4.8	3.9	3.9	0.9	7.8	1.0	1.1	1.1	1.2	4.8	1.0	1.5
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	224	1327	728	69	1546	477	77	194	185	492	741	324
V/C Ratio(X)	0.76	0.28	0.28	0.48	0.59	0.09	0.51	0.22	0.23	0.70	0.11	0.18
Avail Cap(c_a), veh/h	224	3001	1646	224	4502	1391	226	1523	1455	506	3116	1363
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.8	10.8	10.8	24.3	15.3	12.9	24.2	21.0	21.2	21.1	16.6	16.8
Incr Delay (d2), s/veh	12.5	0.0	0.1	1.9	0.1	0.0	1.9	0.2	0.2	3.3	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	1.1	1.2	0.4	2.4	0.3	0.4	0.4	0.4	1.9	0.3	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.3	10.8	10.9	26.2	15.4	12.9	26.1	21.2	21.4	24.4	16.7	16.9
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	B	B
Approach Vol, veh/h		748			984			124			483	
Approach Delay, s/veh		16.2			15.7			22.8			22.2	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	10.4	5.5	24.9	5.7	15.5	10.0	20.4
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	7.0	43.4	6.0	45.0	6.0	44.4	6.0	45.0
Max Q Clear Time (g_c+I1), s	6.8	3.2	2.9	5.9	3.1	3.5	6.8	9.8
Green Ext Time (p_c), s	0.0	0.3	0.0	2.2	0.0	0.4	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	914	61	58	1098	13	37	0	58	17	0	1
Future Volume (veh/h)	2	914	61	58	1098	13	37	0	58	17	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	2	993	66	63	1193	14	40	0	4	18	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	5	1959	130	108	2383	28	151	246	208	40	0	175
Arrive On Green	0.00	0.40	0.40	0.06	0.46	0.46	0.04	0.00	0.13	0.02	0.00	0.11
Sat Flow, veh/h	1781	4891	325	1781	5202	61	3456	1870	1585	1781	0	1585
Grp Volume(v), veh/h	2	691	368	63	781	426	40	0	4	18	0	1
Grp Sat Flow(s),veh/h/ln	1781	1702	1812	1781	1702	1859	1728	1870	1585	1781	0	1585
Q Serve(g_s), s	0.1	6.9	6.9	1.6	7.3	7.3	0.5	0.0	0.1	0.5	0.0	0.0
Cycle Q Clear(g_c), s	0.1	6.9	6.9	1.6	7.3	7.3	0.5	0.0	0.1	0.5	0.0	0.0
Prop In Lane	1.00		0.18	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	5	1363	726	108	1559	852	151	246	208	40	0	175
V/C Ratio(X)	0.41	0.51	0.51	0.59	0.50	0.50	0.27	0.00	0.02	0.45	0.00	0.01
Avail Cap(c_a), veh/h	294	4536	2414	765	5435	2969	723	1730	1466	412	0	1501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.6	10.2	10.2	20.8	8.7	8.7	21.0	0.0	17.2	21.9	0.0	18.0
Incr Delay (d2), s/veh	46.9	0.3	0.6	5.0	0.2	0.5	0.9	0.0	0.0	7.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.1	2.3	0.7	2.1	2.3	0.2	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.5	10.5	10.8	25.8	8.9	9.1	21.9	0.0	17.2	29.7	0.0	18.0
LnGrp LOS	E	B	B	C	A	A	C	A	B	C	A	B
Approach Vol, veh/h		1061			1270			44			19	
Approach Delay, s/veh		10.7			9.8			21.5			29.1	
Approach LOS		B			A			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.5	10.0	7.2	22.7	6.5	9.0	4.6	25.3
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	10.5	42.0	19.5	60.5	9.5	43.0	7.5	72.5
Max Q Clear Time (g_c+I1), s	2.5	2.1	3.6	8.9	2.5	2.0	2.1	9.3
Green Ext Time (p_c), s	0.0	0.0	0.1	9.2	0.0	0.0	0.0	11.3

Intersection Summary	
HCM 6th Ctrl Delay	10.6
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	0	25	1	298	0	364	50	281	310	1
Future Volume (veh/h)	1	1	0	25	1	298	0	364	50	281	310	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	1	1	0	31	1	33	0	449	62	347	383	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	185	42	0	301	3	110	5	589	81	451	1328	3
Arrive On Green	0.07	0.07	0.00	0.07	0.07	0.07	0.00	0.36	0.35	0.25	0.71	0.69
Sat Flow, veh/h	574	598	0	1419	47	1553	1810	1629	225	1795	1879	5
Grp Volume(v), veh/h	2	0	0	31	0	34	0	0	511	347	0	384
Grp Sat Flow(s),veh/h/ln	1171	0	0	1419	0	1600	1810	0	1854	1795	0	1884
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	9.1	6.7	0.0	2.8
Cycle Q Clear(g_c), s	0.8	0.0	0.0	0.6	0.0	0.8	0.0	0.0	9.1	6.7	0.0	2.8
Prop In Lane	0.50		0.00	1.00		0.97	1.00		0.12	1.00		0.00
Lane Grp Cap(c), veh/h	228	0	0	301	0	113	5	0	670	451	0	1332
V/C Ratio(X)	0.01	0.00	0.00	0.10	0.00	0.30	0.00	0.00	0.76	0.77	0.00	0.29
Avail Cap(c_a), veh/h	1644	0	0	1551	0	1524	558	0	3540	1035	0	4103
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.2	0.0	0.0	16.4	0.0	16.5	0.0	0.0	10.5	13.0	0.0	2.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.7	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	2.3	2.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	0.0	0.0	16.4	0.0	17.0	0.0	0.0	11.2	14.0	0.0	2.1
LnGrp LOS	B	A	A	B	A	B	A	A	B	B	A	A
Approach Vol, veh/h		2			65			511			731	
Approach Delay, s/veh		16.2			16.7			11.2			7.7	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.9	18.3		6.1	0.0	31.2		6.1
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0
Max Green Setting (Gmax), s	21.0	70.7		35.0	11.0	80.7		35.0
Max Q Clear Time (g_c+I1), s	8.7	11.1		2.8	0.0	4.8		2.8
Green Ext Time (p_c), s	0.4	1.9		0.0	0.0	1.6		0.1

Intersection Summary		
HCM 6th Ctrl Delay		9.5
HCM 6th LOS		A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1	0	313	752	1
Future Volume (veh/h)	0	1	0	313	752	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	0	1	0	368	885	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	0	618	0	524	1383	609
Arrive On Green	0.00	0.33	0.00	0.35	0.40	0.00
Sat Flow, veh/h	0	1870	0	1585	3483	1598
Grp Volume(v), veh/h	0	1	0	368	885	0
Grp Sat Flow(s),veh/h/ln	0	1870	0	1585	1742	1598
Q Serve(g_s), s	0.0	0.0	0.0	6.3	6.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.3	6.4	0.0
Prop In Lane	0.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	618	0	524	1383	609
V/C Ratio(X)	0.00	0.00	0.00	0.70	0.64	0.00
Avail Cap(c_a), veh/h	0	3147	0	2667	4387	1986
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	7.0	0.0	8.9	7.6	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.7	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.3	1.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	7.0	0.0	10.6	8.1	0.0
LnGrp LOS	A	A	A	B	A	A
Approach Vol, veh/h		1	368		885	
Approach Delay, s/veh		7.0	10.6		8.1	
Approach LOS		A	B		A	

Timer - Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		14.8				14.8		16.4
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		52.5				52.5		38.8
Max Q Clear Time (g_c+I1), s		2.0				8.3		8.4
Green Ext Time (p_c), s		0.0				2.5		3.5

Intersection Summary			
HCM 6th Ctrl Delay			8.8
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	783	0	0	247	947	16	3	136	0	0	0
Future Volume (veh/h)	6	783	0	0	247	947	16	3	136	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	6	807	0	0	255	507	18	0	13			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	101	2647	0	0	618	1047	190	0	85			
Arrive On Green	0.03	0.51	0.00	0.00	0.33	0.33	0.05	0.00	0.05			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	6	807	0	0	255	507	18	0	13			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	0.0	2.0	0.0	0.0	2.3	2.8	0.1	0.0	0.2			
Cycle Q Clear(g_c), s	0.0	2.0	0.0	0.0	2.3	2.8	0.1	0.0	0.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	101	2647	0	0	618	1047	190	0	85			
V/C Ratio(X)	0.06	0.30	0.00	0.00	0.41	0.48	0.09	0.00	0.15			
Avail Cap(c_a), veh/h	2585	17180	0	0	4597	7791	7346	0	3268			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	10.5	3.1	0.0	0.0	5.8	6.0	10.0	0.0	10.0			
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.6	3.1	0.0	0.0	6.0	6.1	10.1	0.0	10.3			
LnGrp LOS	B	A	A	A	A	A	B	A	B			
Approach Vol, veh/h		813			762			31				
Approach Delay, s/veh		3.2			6.1			10.2				
Approach LOS		A			A			B				
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		16.2		6.0	4.1	12.1						
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3						
Max Green Setting (Gmax), s		73.7		45.7	16.0	53.7						
Max Q Clear Time (g_c+I1), s		4.0		2.2	2.0	4.8						
Green Ext Time (p_c), s		3.6		0.0	0.0	2.0						
Intersection Summary												
HCM 6th Ctrl Delay			4.7									
HCM 6th LOS			A									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	190	38	40	5	5	140
Future Volume (veh/h)	190	38	40	5	5	140
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	221	44	47	6	6	163
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	289	611	137	17	913	812
Arrive On Green	0.16	0.33	0.08	0.07	0.51	0.51
Sat Flow, veh/h	1781	1870	1625	208	1781	1585
Grp Volume(v), veh/h	221	44	0	53	6	163
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1833	1781	1585
Q Serve(g_s), s	5.9	0.8	0.0	1.4	0.1	2.8
Cycle Q Clear(g_c), s	5.9	0.8	0.0	1.4	0.1	2.8
Prop In Lane	1.00			0.11	1.00	1.00
Lane Grp Cap(c), veh/h	289	611	0	154	913	812
V/C Ratio(X)	0.76	0.07	0.00	0.34	0.01	0.20
Avail Cap(c_a), veh/h	322	1184	0	681	913	812
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	11.5	0.0	21.5	5.9	6.6
Incr Delay (d2), s/veh	9.4	0.0	0.0	1.3	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.3	0.0	0.6	0.0	3.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.4	11.6	0.0	22.8	5.9	7.1
LnGrp LOS	C	B	A	C	A	A
Approach Vol, veh/h		265	53		169	
Approach Delay, s/veh		26.4	22.8		7.1	
Approach LOS		C	C		A	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				20.3		29.5	12.1	8.2
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				31.0		25.0	8.5	18.0
Max Q Clear Time (g_c+I1), s				2.8		4.8	7.9	3.4
Green Ext Time (p_c), s				0.2		0.5	0.0	0.1

Intersection Summary			
HCM 6th Ctrl Delay			19.3
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	173	172	218	162	125	92	468	118	84	814	59
Future Volume (veh/h)	118	173	172	218	162	125	92	468	118	84	814	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	130	190	154	240	178	111	101	514	110	92	895	60
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	165	223	181	283	320	200	130	980	209	119	1115	75
Arrive On Green	0.09	0.23	0.23	0.16	0.30	0.30	0.07	0.33	0.32	0.07	0.33	0.31
Sat Flow, veh/h	1795	956	775	1781	1068	666	1795	2935	625	1795	3400	228
Grp Volume(v), veh/h	130	0	344	240	0	289	101	313	311	92	471	484
Grp Sat Flow(s),veh/h/ln	1795	0	1732	1781	0	1734	1795	1791	1769	1795	1791	1837
Q Serve(g_s), s	5.4	0.0	14.6	10.1	0.0	10.8	4.3	10.8	11.0	3.9	18.5	18.5
Cycle Q Clear(g_c), s	5.4	0.0	14.6	10.1	0.0	10.8	4.3	10.8	11.0	3.9	18.5	18.5
Prop In Lane	1.00		0.45	1.00		0.38	1.00		0.35	1.00		0.12
Lane Grp Cap(c), veh/h	165	0	403	283	0	520	130	598	591	119	588	603
V/C Ratio(X)	0.79	0.00	0.85	0.85	0.00	0.56	0.78	0.52	0.53	0.77	0.80	0.80
Avail Cap(c_a), veh/h	350	0	766	463	0	880	210	885	875	280	955	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	0.0	28.2	31.4	0.0	22.6	35.1	20.7	20.9	35.3	23.6	23.6
Incr Delay (d2), s/veh	3.1	0.0	2.0	3.8	0.0	0.3	3.8	0.3	0.3	4.0	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	5.7	4.3	0.0	4.0	1.9	4.1	4.1	1.7	7.1	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.3	0.0	30.2	35.3	0.0	23.0	38.8	20.9	21.2	39.3	24.5	24.6
LnGrp LOS	D	A	C	D	A	C	D	C	C	D	C	C
Approach Vol, veh/h		474			529			725			1047	
Approach Delay, s/veh		32.2			28.5			23.5			25.9	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	29.7	16.2	21.9	9.6	29.2	11.1	27.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	12.0	36.7	20.0	34.0	9.0	39.7	15.0	39.0				
Max Q Clear Time (g_c+I1), s	5.9	13.0	12.1	16.6	6.3	20.5	7.4	12.8				
Green Ext Time (p_c), s	0.0	2.1	0.2	1.1	0.0	3.4	0.1	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			26.8									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	615	249	211	644	215	307	287	86	297	507	20
Future Volume (veh/h)	27	615	249	211	644	215	307	287	86	297	507	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	31	715	47	245	749	85	357	334	76	345	590	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	43	1352	88	283	1905	215	441	772	173	429	929	33
Arrive On Green	0.02	0.28	0.26	0.16	0.41	0.40	0.13	0.27	0.25	0.12	0.26	0.25
Sat Flow, veh/h	1795	4915	321	1781	4648	524	3483	2892	648	3483	3524	125
Grp Volume(v), veh/h	31	498	264	245	547	287	357	205	205	345	300	311
Grp Sat Flow(s),veh/h/ln	1795	1716	1805	1781	1702	1767	1742	1791	1749	1742	1791	1858
Q Serve(g_s), s	1.6	11.2	11.3	12.2	10.3	10.5	9.1	8.6	8.9	8.8	13.4	13.5
Cycle Q Clear(g_c), s	1.6	11.2	11.3	12.2	10.3	10.5	9.1	8.6	8.9	8.8	13.4	13.5
Prop In Lane	1.00		0.18	1.00		0.30	1.00		0.37	1.00		0.07
Lane Grp Cap(c), veh/h	43	944	497	283	1395	724	441	478	467	429	472	490
V/C Ratio(X)	0.72	0.53	0.53	0.87	0.39	0.40	0.81	0.43	0.44	0.80	0.63	0.64
Avail Cap(c_a), veh/h	118	1434	754	529	2209	1147	728	768	750	766	788	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	27.9	28.1	37.3	18.9	19.1	38.7	27.6	27.9	38.8	29.6	29.7
Incr Delay (d2), s/veh	8.2	0.2	0.3	3.2	0.1	0.1	1.4	0.2	0.2	1.4	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	4.3	4.6	5.3	3.7	3.9	3.8	3.5	3.5	3.6	5.5	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.3	28.1	28.4	40.5	18.9	19.2	40.0	27.8	28.1	40.1	30.1	30.2
LnGrp LOS	D	C	C	D	B	B	D	C	C	D	C	C
Approach Vol, veh/h		793			1079			767			956	
Approach Delay, s/veh		29.2			23.9			33.6			33.8	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.2	28.3	18.4	29.0	15.5	28.0	6.2	41.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	10.8	10.9	14.2	13.3	11.1	15.5	3.6	12.5				
Green Ext Time (p_c), s	0.4	1.3	0.3	2.9	0.4	2.0	0.0	3.4				
Intersection Summary												
HCM 6th Ctrl Delay			29.7									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	819	168	69	851	223	30	47	36	513	85	96
Future Volume (veh/h)	158	819	168	69	851	223	30	47	36	513	85	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	178	920	183	78	956	131	34	53	40	576	96	-48
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	237	1561	309	114	1516	468	66	192	131	720	946	422
Arrive On Green	0.13	0.37	0.37	0.06	0.30	0.30	0.04	0.09	0.09	0.21	0.26	0.00
Sat Flow, veh/h	1781	4263	844	1781	5106	1577	1795	2035	1386	3483	3582	1598
Grp Volume(v), veh/h	178	734	369	78	956	131	34	46	47	576	96	-48
Grp Sat Flow(s),veh/h/ln	1781	1702	1703	1781	1702	1577	1795	1791	1630	1742	1791	1598
Q Serve(g_s), s	5.9	10.7	10.8	2.6	10.0	3.9	1.1	1.5	1.7	9.7	1.2	0.0
Cycle Q Clear(g_c), s	5.9	10.7	10.8	2.6	10.0	3.9	1.1	1.5	1.7	9.7	1.2	0.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		0.85	1.00		1.00
Lane Grp Cap(c), veh/h	237	1246	624	114	1516	468	66	169	153	720	946	422
V/C Ratio(X)	0.75	0.59	0.59	0.69	0.63	0.28	0.52	0.27	0.31	0.80	0.10	-0.11
Avail Cap(c_a), veh/h	506	3120	1561	188	3768	1164	189	1275	1161	932	3131	1397
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.7	15.8	15.8	28.3	18.7	16.6	29.2	26.0	26.2	23.2	17.2	0.0
Incr Delay (d2), s/veh	1.8	0.2	0.3	2.7	0.2	0.1	2.3	0.3	0.4	2.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	3.4	3.5	1.1	3.3	1.2	0.5	0.6	0.6	3.7	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	16.0	16.1	31.0	18.9	16.7	31.5	26.3	26.7	26.1	17.2	0.0
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	B	A
Approach Vol, veh/h		1281			1165			127			624	
Approach Delay, s/veh		17.6			19.5			27.8			26.7	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.2	10.6	7.4	27.4	5.8	21.1	11.7	23.1				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	16.0	43.4	6.0	56.0	6.0	53.4	17.0	45.0				
Max Q Clear Time (g_c+I1), s	11.7	3.7	4.6	12.8	3.1	3.2	7.9	12.0				
Green Ext Time (p_c), s	0.6	0.3	0.0	4.9	0.0	0.3	0.1	4.6				
Intersection Summary												
HCM 6th Ctrl Delay			20.5									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1369	89	68	1165	23	139	4	83	29	4	8
Future Volume (veh/h)	7	1369	89	68	1165	23	139	4	83	29	4	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	1488	97	74	1266	25	151	4	31	32	4	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	18	2513	164	102	2888	57	254	222	188	61	40	91
Arrive On Green	0.01	0.51	0.51	0.06	0.56	0.56	0.07	0.12	0.12	0.03	0.08	0.08
Sat Flow, veh/h	1781	4898	319	1781	5154	102	3456	1870	1585	1781	512	1151
Grp Volume(v), veh/h	8	1034	551	74	836	455	151	4	31	32	0	13
Grp Sat Flow(s),veh/h/ln	1781	1702	1813	1781	1702	1852	1728	1870	1585	1781	0	1663
Q Serve(g_s), s	0.3	13.4	13.4	2.6	9.1	9.1	2.7	0.1	1.1	1.1	0.0	0.5
Cycle Q Clear(g_c), s	0.3	13.4	13.4	2.6	9.1	9.1	2.7	0.1	1.1	1.1	0.0	0.5
Prop In Lane	1.00		0.18	1.00		0.05	1.00		1.00	1.00		0.69
Lane Grp Cap(c), veh/h	18	1747	930	102	1907	1038	254	222	188	61	0	132
V/C Ratio(X)	0.43	0.59	0.59	0.72	0.44	0.44	0.59	0.02	0.16	0.53	0.00	0.10
Avail Cap(c_a), veh/h	155	3365	1792	409	3850	2094	738	1390	1178	239	0	1105
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.1	10.8	10.8	29.3	8.1	8.1	28.4	24.6	25.0	30.0	0.0	27.0
Incr Delay (d2), s/veh	15.2	0.3	0.6	9.2	0.2	0.3	2.2	0.0	0.4	7.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.3	4.6	1.3	2.7	3.0	1.1	0.1	0.4	0.6	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	11.1	11.4	38.5	8.3	8.4	30.6	24.6	25.5	37.0	0.0	27.3
LnGrp LOS	D	B	B	D	A	A	C	C	C	D	A	C
Approach Vol, veh/h		1593			1365			186			45	
Approach Delay, s/veh		11.4			9.9			29.6			34.2	
Approach LOS		B			A			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.6	11.5	8.1	36.9	9.1	9.0	5.2	39.9
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	8.5	47.0	14.5	62.5	13.5	42.0	5.5	71.5
Max Q Clear Time (g_c+I1), s	3.1	3.1	4.6	15.4	4.7	2.5	2.3	11.1
Green Ext Time (p_c), s	0.0	0.1	0.1	17.0	0.3	0.0	0.0	12.6

Intersection Summary		
HCM 6th Ctrl Delay		12.1
HCM 6th LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	0	73	0	56	0	254	36	24	265	0
Future Volume (veh/h)	4	0	0	73	0	56	0	254	36	24	265	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	5	0	0	90	0	69	0	314	44	30	327	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	431	0	0	509	0	215	8	520	73	92	976	0
Arrive On Green	0.13	0.00	0.00	0.13	0.00	0.13	0.00	0.32	0.30	0.05	0.52	0.00
Sat Flow, veh/h	958	0	0	1424	0	1595	1810	1625	228	1795	1885	0
Grp Volume(v), veh/h	5	0	0	90	0	69	0	0	358	30	327	0
Grp Sat Flow(s),veh/h/ln	958	0	0	1424	0	1595	1810	0	1853	1795	1885	0
Q Serve(g_s), s	0.1	0.0	0.0	0.1	0.0	0.9	0.0	0.0	3.9	0.4	2.4	0.0
Cycle Q Clear(g_c), s	1.0	0.0	0.0	1.1	0.0	0.9	0.0	0.0	3.9	0.4	2.4	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.12	1.00		0.00
Lane Grp Cap(c), veh/h	431	0	0	509	0	215	8	0	593	92	976	0
V/C Ratio(X)	0.01	0.00	0.00	0.18	0.00	0.32	0.00	0.00	0.60	0.33	0.33	0.00
Avail Cap(c_a), veh/h	2256	0	0	2434	0	2371	871	0	5525	1616	6410	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.8	0.0	0.0	9.4	0.0	9.3	0.0	0.0	6.9	10.9	3.4	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.4	0.8	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.5	0.1	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.8	0.0	0.0	9.5	0.0	9.7	0.0	0.0	7.2	11.7	3.4	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	B	A	A
Approach Vol, veh/h		5			159			358			357	
Approach Delay, s/veh		9.8			9.6			7.2			4.1	
Approach LOS		A			A			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	12.4		6.7	0.0	17.2		6.7				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	21.0	70.7		35.0	11.0	80.7		35.0				
Max Q Clear Time (g_c+I1), s	2.4	5.9		3.0	0.0	4.4		3.1				
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	1.3		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			6.4									
HCM 6th LOS			A									

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	147	1294	0
Future Volume (veh/h)	0	0	0	147	1294	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	0	0	0	173	1522	-1
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	0	288	0	244	2025	908
Arrive On Green	0.00	0.00	0.00	0.17	0.58	0.00
Sat Flow, veh/h	0	1870	0	1585	3483	1598
Grp Volume(v), veh/h	0	0	0	173	1522	-1
Grp Sat Flow(s),veh/h/ln	0	1870	0	1585	1742	1598
Q Serve(g_s), s	0.0	0.0	0.0	3.9	12.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.9	12.4	0.0
Prop In Lane	0.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	288	0	244	2025	908
V/C Ratio(X)	0.00	0.00	0.00	0.71	0.75	0.00
Avail Cap(c_a), veh/h	0	2389	0	2024	3763	1705
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	15.1	5.9	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	3.8	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.3	1.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	18.9	6.5	0.0
LnGrp LOS	A	A	A	B	A	A
Approach Vol, veh/h		0	173		1521	
Approach Delay, s/veh		0.0	18.9		6.5	
Approach LOS			B		A	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	11.2	11.2	27.0
Change Period (Y+Rc), s	5.3	5.3	5.3
Max Green Setting (Gmax), s	48.7	48.7	40.7
Max Q Clear Time (g_c+I1), s	0.0	5.9	14.4
Green Ext Time (p_c), s	0.0	1.1	7.3

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1284	0	0	143	902	4	5	196	0	0	0
Future Volume (veh/h)	10	1284	0	0	143	902	4	5	196	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	10	1324	0	0	147	461	4	5	75			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	93	3135	0	0	886	1501	146	153	130			
Arrive On Green	0.03	0.61	0.00	0.00	0.47	0.47	0.08	0.08	0.08			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	1767	1856	1572			
Grp Volume(v), veh/h	10	1324	0	0	147	461	4	5	75			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	1856	1572			
Q Serve(g_s), s	0.1	4.2	0.0	0.0	1.4	2.8	0.1	0.1	1.4			
Cycle Q Clear(g_c), s	0.1	4.2	0.0	0.0	1.4	2.8	0.1	0.1	1.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	93	3135	0	0	886	1501	146	153	130			
V/C Ratio(X)	0.11	0.42	0.00	0.00	0.17	0.31	0.03	0.03	0.58			
Avail Cap(c_a), veh/h	1847	12272	0	0	3284	5565	2624	2755	2335			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	14.8	3.2	0.0	0.0	4.7	5.1	13.1	13.1	13.8			
Incr Delay (d2), s/veh	0.5	0.1	0.0	0.0	0.1	0.1	0.1	0.1	4.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.3	3.3	0.0	0.0	4.8	5.2	13.2	13.2	17.8			
LnGrp LOS	B	A	A	A	A	A	B	B	B			
Approach Vol, veh/h		1334			608			84				
Approach Delay, s/veh		3.4			5.1			17.3				
Approach LOS		A			A			B				

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		23.8		7.4	4.3	19.4						
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3						
Max Green Setting (Gmax), s		73.7		45.7	16.0	53.7						
Max Q Clear Time (g_c+I1), s		6.2		3.4	2.1	4.8						
Green Ext Time (p_c), s		12.2		0.3	0.0	2.7						

Intersection Summary			
HCM 6th Ctrl Delay			4.5
HCM 6th LOS			A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	169	29	21	4	7	145
Future Volume (veh/h)	169	29	21	4	7	145
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	197	34	24	5	8	169
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	265	564	105	22	947	842
Arrive On Green	0.15	0.30	0.07	0.06	0.53	0.53
Sat Flow, veh/h	1781	1870	1501	313	1781	1585
Grp Volume(v), veh/h	197	34	0	29	8	169
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1814	1781	1585
Q Serve(g_s), s	5.1	0.6	0.0	0.7	0.1	2.7
Cycle Q Clear(g_c), s	5.1	0.6	0.0	0.7	0.1	2.7
Prop In Lane	1.00			0.17	1.00	1.00
Lane Grp Cap(c), veh/h	265	564	0	126	947	842
V/C Ratio(X)	0.74	0.06	0.00	0.23	0.01	0.20
Avail Cap(c_a), veh/h	334	1228	0	699	947	842
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	11.9	0.0	21.1	5.3	5.9
Incr Delay (d2), s/veh	6.6	0.0	0.0	0.9	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.2	0.0	0.3	0.0	3.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.2	12.0	0.0	22.1	5.3	6.4
LnGrp LOS	C	B	A	C	A	A
Approach Vol, veh/h		231	29		177	
Approach Delay, s/veh		24.1	22.1		6.4	
Approach LOS		C	C		A	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				18.5		29.5	11.1	7.3
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				31.0		25.0	8.5	18.0
Max Q Clear Time (g_c+I1), s				2.6		4.7	7.1	2.7
Green Ext Time (p_c), s				0.1		0.5	0.1	0.1

Intersection Summary			
HCM 6th Ctrl Delay			16.8
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	105	56	44	90	72	123	448	138	107	384	88
Future Volume (veh/h)	65	105	56	44	90	72	123	448	138	107	384	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	71	115	27	48	99	53	135	492	132	118	422	92
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	99	234	55	74	165	89	176	850	227	153	849	183
Arrive On Green	0.05	0.16	0.16	0.04	0.15	0.15	0.10	0.30	0.27	0.09	0.29	0.26
Sat Flow, veh/h	1795	1471	345	1781	1133	607	1795	2793	745	1795	2913	629
Grp Volume(v), veh/h	71	0	142	48	0	152	135	314	310	118	258	256
Grp Sat Flow(s),veh/h/ln	1795	0	1816	1781	0	1740	1795	1791	1746	1795	1791	1751
Q Serve(g_s), s	1.5	0.0	2.8	1.0	0.0	3.2	2.9	5.8	5.9	2.5	4.7	4.8
Cycle Q Clear(g_c), s	1.5	0.0	2.8	1.0	0.0	3.2	2.9	5.8	5.9	2.5	4.7	4.8
Prop In Lane	1.00		0.19	1.00		0.35	1.00		0.43	1.00		0.36
Lane Grp Cap(c), veh/h	99	0	290	74	0	254	176	545	532	153	522	510
V/C Ratio(X)	0.72	0.00	0.49	0.65	0.00	0.60	0.77	0.58	0.58	0.77	0.49	0.50
Avail Cap(c_a), veh/h	505	0	1719	456	0	1602	873	1833	1787	781	1741	1703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.2	0.0	15.0	18.5	0.0	15.6	17.2	11.5	11.7	17.5	11.5	11.7
Incr Delay (d2), s/veh	3.6	0.0	0.5	3.5	0.0	0.8	2.6	0.4	0.4	3.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.9	0.4	0.0	1.0	1.0	1.6	1.6	0.9	1.3	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.8	0.0	15.5	22.0	0.0	16.5	19.8	11.8	12.1	20.6	11.7	12.0
LnGrp LOS	C	A	B	C	A	B	B	B	B	C	B	B
Approach Vol, veh/h		213			200			759			632	
Approach Delay, s/veh		17.6			17.8			13.4			13.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	15.9	5.6	10.2	7.8	15.4	6.1	9.7
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0
Max Green Setting (Gmax), s	17.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0
Max Q Clear Time (g_c+I1), s	4.5	7.9	3.0	4.8	4.9	6.8	3.5	5.2
Green Ext Time (p_c), s	0.1	2.2	0.0	0.4	0.1	1.7	0.0	0.5

Intersection Summary		
HCM 6th Ctrl Delay		14.4
HCM 6th LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	735	156	191	524	176	210	304	162	252	259	24
Future Volume (veh/h)	67	735	156	191	524	176	210	304	162	252	259	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	766	44	199	546	69	219	317	114	262	270	25
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	90	1391	80	249	1708	213	330	571	201	379	780	72
Arrive On Green	0.05	0.28	0.26	0.14	0.37	0.34	0.09	0.22	0.20	0.11	0.23	0.21
Sat Flow, veh/h	1810	5010	286	1810	4671	582	3510	2604	917	3510	3340	307
Grp Volume(v), veh/h	70	528	282	199	402	213	219	218	213	262	145	150
Grp Sat Flow(s),veh/h/ln	1810	1729	1838	1810	1729	1795	1755	1805	1716	1755	1805	1842
Q Serve(g_s), s	2.4	8.1	8.2	6.6	5.2	5.4	3.8	6.7	6.9	4.5	4.2	4.2
Cycle Q Clear(g_c), s	2.4	8.1	8.2	6.6	5.2	5.4	3.8	6.7	6.9	4.5	4.2	4.2
Prop In Lane	1.00		0.16	1.00		0.32	1.00		0.53	1.00		0.17
Lane Grp Cap(c), veh/h	90	960	510	249	1264	656	330	396	377	379	422	430
V/C Ratio(X)	0.78	0.55	0.55	0.80	0.32	0.32	0.66	0.55	0.57	0.69	0.34	0.35
Avail Cap(c_a), veh/h	320	2334	1241	727	3112	1616	790	1189	1131	903	1247	1273
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	19.2	19.3	26.0	14.2	14.4	27.2	21.6	22.0	26.7	19.9	20.0
Incr Delay (d2), s/veh	5.3	0.2	0.3	2.2	0.1	0.1	0.9	0.4	0.5	0.8	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.8	3.0	2.7	1.7	1.8	1.5	2.5	2.5	1.7	1.5	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	19.3	19.6	28.2	14.2	14.5	28.1	22.0	22.5	27.6	20.1	20.2
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		880			814			650			557	
Approach Delay, s/veh		20.6			17.7			24.2			23.6	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	17.7	12.6	21.3	9.8	18.5	7.1	26.7
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7
Max Q Clear Time (g_c+I1), s	6.5	8.9	8.6	10.2	5.8	6.2	4.4	7.4
Green Ext Time (p_c), s	0.3	1.5	0.2	3.2	0.2	0.9	0.0	2.4

Intersection Summary		
HCM 6th Ctrl Delay		21.2
HCM 6th LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	528	38	99	842	143	112	86	221	304	87	194
Future Volume (veh/h)	153	528	38	99	842	143	112	86	221	304	87	194
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	172	593	37	111	946	41	126	97	248	342	98	62
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	185	1510	94	155	1486	459	174	395	352	417	872	382
Arrive On Green	0.10	0.31	0.31	0.09	0.29	0.29	0.10	0.22	0.21	0.12	0.24	0.24
Sat Flow, veh/h	1781	4910	304	1781	5106	1577	1795	1791	1595	3483	3582	1568
Grp Volume(v), veh/h	172	410	220	111	946	41	126	97	248	342	98	62
Grp Sat Flow(s),veh/h/ln	1781	1702	1810	1781	1702	1577	1795	1791	1595	1742	1791	1568
Q Serve(g_s), s	6.0	5.9	6.0	3.8	10.1	1.2	4.3	2.8	9.0	6.0	1.3	2.0
Cycle Q Clear(g_c), s	6.0	5.9	6.0	3.8	10.1	1.2	4.3	2.8	9.0	6.0	1.3	2.0
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	185	1047	557	155	1486	459	174	395	352	417	872	382
V/C Ratio(X)	0.93	0.39	0.40	0.71	0.64	0.09	0.72	0.25	0.70	0.82	0.11	0.16
Avail Cap(c_a), veh/h	185	2472	1315	185	3709	1145	186	1255	1118	417	2567	1124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.8	17.1	17.1	27.8	19.3	16.2	27.5	20.1	22.8	26.9	18.4	18.7
Incr Delay (d2), s/veh	46.0	0.1	0.2	7.3	0.2	0.0	10.2	0.1	1.0	11.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	2.0	2.1	1.8	3.4	0.4	2.1	1.0	3.1	2.9	0.5	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.9	17.2	17.3	35.1	19.5	16.2	37.6	20.2	23.7	38.4	18.5	18.7
LnGrp LOS	E	B	B	D	B	B	D	C	C	D	B	B
Approach Vol, veh/h		802			1098			471			502	
Approach Delay, s/veh		29.4			21.0			26.7			32.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	18.6	9.0	24.1	9.6	20.0	10.0	23.0
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	7.0	43.4	6.0	45.0	6.0	44.4	6.0	45.0
Max Q Clear Time (g_c+I1), s	8.0	11.0	5.8	8.0	6.3	4.0	8.0	12.1
Green Ext Time (p_c), s	0.0	1.3	0.0	2.4	0.0	0.4	0.0	4.4

Intersection Summary	
HCM 6th Ctrl Delay	26.2
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1118	71	93	1180	13	56	0	143	17	0	1
Future Volume (veh/h)	2	1118	71	93	1180	13	56	0	143	17	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	2	1215	77	101	1283	14	61	0	96	18	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	22	2155	137	150	2660	29	196	247	210	39	0	155
Arrive On Green	0.01	0.44	0.43	0.08	0.51	0.50	0.06	0.00	0.13	0.02	0.00	0.10
Sat Flow, veh/h	1781	4908	311	1781	5207	57	3456	1870	1585	1781	0	1585
Grp Volume(v), veh/h	2	843	449	101	839	458	61	0	96	18	0	1
Grp Sat Flow(s),veh/h/ln	1781	1702	1814	1781	1702	1860	1728	1870	1585	1781	0	1585
Q Serve(g_s), s	0.1	9.4	9.5	2.8	8.2	8.2	0.9	0.0	2.9	0.5	0.0	0.0
Cycle Q Clear(g_c), s	0.1	9.4	9.5	2.8	8.2	8.2	0.9	0.0	2.9	0.5	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	22	1495	797	150	1739	950	196	247	210	39	0	155
V/C Ratio(X)	0.09	0.56	0.56	0.67	0.48	0.48	0.31	0.00	0.46	0.46	0.00	0.01
Avail Cap(c_a), veh/h	278	4056	2162	696	4854	2652	641	1534	1300	365	0	1331
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.0	10.7	10.7	22.8	8.1	8.1	23.2	0.0	20.5	24.7	0.0	20.9
Incr Delay (d2), s/veh	1.7	0.3	0.6	5.2	0.2	0.4	0.9	0.0	1.6	8.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.6	2.8	1.2	1.9	2.2	0.4	0.0	1.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	11.0	11.4	27.9	8.3	8.5	24.1	0.0	22.1	32.8	0.0	20.9
LnGrp LOS	C	B	B	C	A	A	C	A	C	C	A	C
Approach Vol, veh/h		1294			1398			157			19	
Approach Delay, s/veh		11.2			9.8			22.9			32.2	
Approach LOS		B			A			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	10.8	8.3	26.5	7.4	9.0	4.6	30.2
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	10.5	42.0	19.5	60.5	9.5	43.0	7.5	72.5
Max Q Clear Time (g_c+I1), s	2.5	4.9	4.8	11.5	2.9	2.0	2.1	10.2
Green Ext Time (p_c), s	0.0	0.3	0.2	10.5	0.1	0.0	0.0	10.7

Intersection Summary	
HCM 6th Ctrl Delay	11.3
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	0	25	1	298	0	395	50	281	378	1
Future Volume (veh/h)	1	1	0	25	1	298	0	395	50	281	378	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	1	1	0	31	1	33	0	488	62	347	467	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	178	44	0	290	3	108	5	625	79	448	1350	3
Arrive On Green	0.07	0.07	0.00	0.07	0.07	0.07	0.00	0.38	0.37	0.25	0.72	0.71
Sat Flow, veh/h	569	638	0	1419	47	1553	1810	1648	209	1795	1880	4
Grp Volume(v), veh/h	2	0	0	31	0	34	0	0	550	347	0	468
Grp Sat Flow(s),veh/h/ln	1207	0	0	1419	0	1600	1810	0	1857	1795	0	1884
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	10.2	7.0	0.0	3.6
Cycle Q Clear(g_c), s	0.8	0.0	0.0	0.6	0.0	0.8	0.0	0.0	10.2	7.0	0.0	3.6
Prop In Lane	0.50		0.00	1.00		0.97	1.00		0.11	1.00		0.00
Lane Grp Cap(c), veh/h	222	0	0	290	0	111	5	0	704	448	0	1353
V/C Ratio(X)	0.01	0.00	0.00	0.11	0.00	0.31	0.00	0.00	0.78	0.78	0.00	0.35
Avail Cap(c_a), veh/h	1571	0	0	1482	0	1455	533	0	3386	989	0	3919
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	0.0	0.0	17.2	0.0	17.3	0.0	0.0	10.7	13.6	0.0	2.1
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.7	1.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	2.6	2.4	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.9	0.0	0.0	17.3	0.0	17.9	0.0	0.0	11.4	14.7	0.0	2.1
LnGrp LOS	B	A	A	B	A	B	A	A	B	B	A	A
Approach Vol, veh/h		2			65			550			815	
Approach Delay, s/veh		16.9			17.6			11.4			7.5	
Approach LOS		B			B			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.2	19.6		6.2	0.0	32.8		6.2				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	21.0	70.7		35.0	11.0	80.7		35.0				
Max Q Clear Time (g_c+I1), s	9.0	12.2		2.8	0.0	5.6		2.8				
Green Ext Time (p_c), s	0.4	2.1		0.0	0.0	2.0		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			9.5									
HCM 6th LOS			A									

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1	0	315	791	1
Future Volume (veh/h)	0	1	0	315	791	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	0	1	0	371	931	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	0	618	0	524	1420	627
Arrive On Green	0.00	0.33	0.00	0.35	0.41	0.00
Sat Flow, veh/h	0	1870	0	1585	3483	1598
Grp Volume(v), veh/h	0	1	0	371	931	0
Grp Sat Flow(s),veh/h/ln	0	1870	0	1585	1742	1598
Q Serve(g_s), s	0.0	0.0	0.0	6.6	7.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.6	7.0	0.0
Prop In Lane	0.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	618	0	524	1420	627
V/C Ratio(X)	0.00	0.00	0.00	0.71	0.66	0.00
Avail Cap(c_a), veh/h	0	3028	0	2566	4221	1912
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	7.3	0.0	9.3	7.8	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.8	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.4	1.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	7.3	0.0	11.0	8.3	0.0
LnGrp LOS	A	A	A	B	A	A
Approach Vol, veh/h		1	371		931	
Approach Delay, s/veh		7.3	11.0		8.3	
Approach LOS		A	B		A	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	15.2	15.2	17.2
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	52.5	52.5	38.8
Max Q Clear Time (g_c+I1), s	2.0	8.6	9.0
Green Ext Time (p_c), s	0.0	2.5	3.7

Intersection Summary	
HCM 6th Ctrl Delay	9.1
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	822	0	0	249	962	16	3	138	0	0	0
Future Volume (veh/h)	6	822	0	0	249	962	16	3	138	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	6	847	0	0	257	523	18	0	15			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	100	2660	0	0	626	1061	196	0	87			
Arrive On Green	0.03	0.52	0.00	0.00	0.33	0.33	0.06	0.00	0.06			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	6	847	0	0	257	523	18	0	15			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	0.0	2.1	0.0	0.0	2.4	2.9	0.1	0.0	0.2			
Cycle Q Clear(g_c), s	0.0	2.1	0.0	0.0	2.4	2.9	0.1	0.0	0.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	100	2660	0	0	626	1061	196	0	87			
V/C Ratio(X)	0.06	0.32	0.00	0.00	0.41	0.49	0.09	0.00	0.17			
Avail Cap(c_a), veh/h	2561	17017	0	0	4553	7717	7276	0	3237			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	10.6	3.1	0.0	0.0	5.8	6.0	10.1	0.0	10.1			
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.7	3.2	0.0	0.0	6.0	6.1	10.1	0.0	10.5			
LnGrp LOS	B	A	A	A	A	A	B	A	B			
Approach Vol, veh/h		853			780			33				
Approach Delay, s/veh		3.2			6.1			10.3				
Approach LOS		A			A			B				

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		16.4		6.0	4.1	12.3
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3
Max Green Setting (Gmax), s		73.7		45.7	16.0	53.7
Max Q Clear Time (g_c+I1), s		4.1		2.2	2.0	4.9
Green Ext Time (p_c), s		3.8		0.0	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	4.7
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	7.1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	174	0	0	0	0	60
Future Vol, veh/h	174	0	0	0	0	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	189	0	0	0	0	65

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	33	33	65	0	-	0
Stage 1	33	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	976	1033	1535	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	976	1033	1535	-	-	-
Mov Cap-2 Maneuver	976	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1535	-	976	-	-
HCM Lane V/C Ratio	-	-	0.194	-	-
HCM Control Delay (s)	0	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	38	17	0	40	5	56	308	0	5	113	140
Future Volume (veh/h)	190	38	17	0	40	5	56	308	0	5	113	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	221	44	18	0	47	6	61	335	0	6	123	163
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	263	338	138	2	109	14	85	423	0	604	373	494
Arrive On Green	0.15	0.27	0.26	0.00	0.07	0.06	0.05	0.23	0.00	0.34	0.51	0.52
Sat Flow, veh/h	1781	1261	516	1781	1625	208	1781	1870	0	1781	730	967
Grp Volume(v), veh/h	221	0	62	0	0	53	61	335	0	6	0	286
Grp Sat Flow(s),veh/h/ln	1781	0	1777	1781	0	1833	1781	1870	0	1781	0	1696
Q Serve(g_s), s	9.1	0.0	2.0	0.0	0.0	2.1	2.5	12.7	0.0	0.2	0.0	7.4
Cycle Q Clear(g_c), s	9.1	0.0	2.0	0.0	0.0	2.1	2.5	12.7	0.0	0.2	0.0	7.4
Prop In Lane	1.00		0.29	1.00		0.11	1.00		0.00	1.00		0.57
Lane Grp Cap(c), veh/h	263	0	477	2	0	123	85	423	0	604	0	867
V/C Ratio(X)	0.84	0.00	0.13	0.00	0.00	0.43	0.71	0.79	0.00	0.01	0.00	0.33
Avail Cap(c_a), veh/h	263	0	570	119	0	451	119	458	0	604	0	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.2	0.0	20.9	0.0	0.0	33.7	35.3	27.4	0.0	16.5	0.0	10.7
Incr Delay (d2), s/veh	20.9	0.0	0.1	0.0	0.0	2.4	11.6	8.6	0.0	0.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	0.8	0.0	0.0	1.0	1.3	6.4	0.0	0.1	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	0.0	21.0	0.0	0.0	36.1	46.9	36.0	0.0	16.5	0.0	11.7
LnGrp LOS	D	A	C	A	A	D	D	D	A	B	A	B
Approach Vol, veh/h		283			53			396			292	
Approach Delay, s/veh		45.2			36.1			37.7			11.8	
Approach LOS		D			D			D			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.5	21.5	0.0	24.1	8.1	42.9	15.1	9.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	25.0	18.4	5.0	23.6	5.0	38.4	10.6	18.0
Max Q Clear Time (g_c+I1), s	2.2	14.7	0.0	4.0	4.5	9.4	11.1	4.1
Green Ext Time (p_c), s	0.0	0.7	0.0	0.2	0.0	1.7	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	32.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	173	172	271	162	146	92	476	141	84	829	59
Future Volume (veh/h)	118	173	172	271	162	146	92	476	141	84	829	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	130	190	154	298	178	134	101	523	135	92	911	60
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	163	219	178	335	320	241	129	930	239	118	1104	73
Arrive On Green	0.09	0.23	0.23	0.19	0.33	0.33	0.07	0.33	0.31	0.07	0.32	0.31
Sat Flow, veh/h	1795	956	775	1781	981	739	1795	2818	724	1795	3404	224
Grp Volume(v), veh/h	130	0	344	298	0	312	101	331	327	92	479	492
Grp Sat Flow(s),veh/h/ln	1795	0	1732	1781	0	1720	1795	1791	1751	1795	1791	1838
Q Serve(g_s), s	6.1	0.0	16.4	14.0	0.0	12.8	4.7	13.0	13.2	4.3	21.2	21.2
Cycle Q Clear(g_c), s	6.1	0.0	16.4	14.0	0.0	12.8	4.7	13.0	13.2	4.3	21.2	21.2
Prop In Lane	1.00		0.45	1.00		0.43	1.00		0.41	1.00		0.12
Lane Grp Cap(c), veh/h	163	0	397	335	0	562	129	591	578	118	581	596
V/C Ratio(X)	0.80	0.00	0.87	0.89	0.00	0.56	0.78	0.56	0.57	0.78	0.83	0.83
Avail Cap(c_a), veh/h	314	0	687	416	0	782	188	794	776	251	856	879
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	0.0	31.8	33.9	0.0	23.8	39.1	23.6	23.9	39.4	26.7	26.8
Incr Delay (d2), s/veh	3.3	0.0	2.3	15.6	0.0	0.3	6.9	0.3	0.3	4.1	2.7	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	6.6	7.1	0.0	4.8	2.2	5.1	5.1	1.9	8.6	8.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	0.0	34.1	49.5	0.0	24.1	46.0	23.9	24.2	43.5	29.4	29.4
LnGrp LOS	D	A	C	D	A	C	D	C	C	D	C	C
Approach Vol, veh/h		474			610			759			1063	
Approach Delay, s/veh		36.2			36.5			27.0			30.6	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	32.3	20.1	23.6	10.2	31.8	11.8	32.0
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0
Max Green Setting (Gmax), s	12.0	36.7	20.0	34.0	9.0	39.7	15.0	39.0
Max Q Clear Time (g_c+I1), s	6.3	15.2	16.0	18.4	6.7	23.2	8.1	14.8
Green Ext Time (p_c), s	0.0	2.2	0.2	1.1	0.0	3.3	0.1	1.1

Intersection Summary	
HCM 6th Ctrl Delay	31.8
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	626	260	211	677	223	313	289	86	300	511	20
Future Volume (veh/h)	27	626	260	211	677	223	313	289	86	300	511	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	31	728	59	245	787	94	364	336	76	349	594	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	43	1338	108	282	1901	226	446	774	172	432	928	33
Arrive On Green	0.02	0.28	0.26	0.16	0.41	0.40	0.13	0.27	0.25	0.12	0.26	0.25
Sat Flow, veh/h	1795	4831	389	1781	4619	548	3483	2896	645	3483	3524	124
Grp Volume(v), veh/h	31	515	272	245	579	302	364	206	206	349	302	313
Grp Sat Flow(s),veh/h/ln	1795	1716	1789	1781	1702	1763	1742	1791	1750	1742	1791	1858
Q Serve(g_s), s	1.6	11.8	12.0	12.4	11.1	11.3	9.4	8.8	9.1	9.0	13.8	13.8
Cycle Q Clear(g_c), s	1.6	11.8	12.0	12.4	11.1	11.3	9.4	8.8	9.1	9.0	13.8	13.8
Prop In Lane	1.00		0.22	1.00		0.31	1.00		0.37	1.00		0.07
Lane Grp Cap(c), veh/h	43	950	495	282	1401	726	446	479	468	432	471	489
V/C Ratio(X)	0.73	0.54	0.55	0.87	0.41	0.42	0.82	0.43	0.44	0.81	0.64	0.64
Avail Cap(c_a), veh/h	117	1412	736	521	2176	1127	717	757	739	755	776	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	28.4	28.6	37.9	19.3	19.4	39.2	28.0	28.3	39.4	30.1	30.2
Incr Delay (d2), s/veh	8.4	0.2	0.4	3.2	0.1	0.1	1.7	0.2	0.2	1.4	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	4.6	4.9	5.4	4.0	4.3	3.9	3.6	3.6	3.7	5.6	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.2	28.6	28.9	41.1	19.3	19.6	40.8	28.2	28.5	40.7	30.7	30.7
LnGrp LOS	D	C	C	D	B	B	D	C	C	D	C	C
Approach Vol, veh/h		818			1126			776			964	
Approach Delay, s/veh		29.6			24.1			34.2			34.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.5	28.7	18.6	29.6	15.8	28.3	6.2	42.0
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7
Max Q Clear Time (g_c+I1), s	11.0	11.1	14.4	14.0	11.4	15.8	3.6	13.3
Green Ext Time (p_c), s	0.5	1.3	0.3	3.0	0.4	2.0	0.0	3.6

Intersection Summary		
HCM 6th Ctrl Delay		30.1
HCM 6th LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	871	265	274	891	223	82	68	168	513	121	105
Future Volume (veh/h)	168	871	265	274	891	223	82	68	168	513	121	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	189	979	252	308	1001	52	92	76	9	576	136	20
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	241	1336	343	280	1804	558	130	267	31	701	757	331
Arrive On Green	0.14	0.33	0.33	0.16	0.35	0.35	0.07	0.08	0.08	0.20	0.21	0.21
Sat Flow, veh/h	1781	4033	1036	1781	5106	1578	1795	3231	376	3483	3582	1567
Grp Volume(v), veh/h	189	826	405	308	1001	52	92	42	43	576	136	20
Grp Sat Flow(s),veh/h/ln	1781	1702	1665	1781	1702	1578	1795	1791	1816	1742	1791	1567
Q Serve(g_s), s	7.5	15.6	15.7	11.5	11.5	1.6	3.7	1.6	1.6	11.6	2.3	0.7
Cycle Q Clear(g_c), s	7.5	15.6	15.7	11.5	11.5	1.6	3.7	1.6	1.6	11.6	2.3	0.7
Prop In Lane	1.00		0.62	1.00		1.00	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	241	1128	552	280	1804	558	130	148	150	701	757	331
V/C Ratio(X)	0.78	0.73	0.73	1.10	0.55	0.09	0.71	0.28	0.29	0.82	0.18	0.06
Avail Cap(c_a), veh/h	354	2293	1121	280	3230	998	209	1059	1074	930	2658	1163
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.5	21.6	21.6	30.8	19.0	15.8	33.1	31.5	31.5	27.9	23.6	23.0
Incr Delay (d2), s/veh	3.7	0.3	0.7	82.6	0.1	0.0	2.6	0.4	0.4	3.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	5.5	5.5	10.9	4.0	0.5	1.6	0.7	0.7	4.7	0.9	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.3	21.9	22.3	113.4	19.1	15.8	35.7	31.8	31.9	31.3	23.6	23.0
LnGrp LOS	C	C	C	F	B	B	D	C	C	C	C	C
Approach Vol, veh/h		1420			1361			177			732	
Approach Delay, s/veh		23.7			40.3			33.9			29.7	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.2	10.8	15.0	29.0	8.8	20.2	13.4	30.6
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	19.0	42.7	11.0	48.7	8.0	53.7	14.0	45.7
Max Q Clear Time (g_c+I1), s	13.6	3.6	13.5	17.7	5.7	4.3	9.5	13.5
Green Ext Time (p_c), s	0.6	0.2	0.0	5.6	0.0	0.5	0.1	4.7

Intersection Summary		
HCM 6th Ctrl Delay		31.5
HCM 6th LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1531	83	181	1395	23	155	4	141	29	4	8
Future Volume (veh/h)	7	1531	83	181	1395	23	155	4	141	29	4	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	1664	90	197	1516	25	168	4	94	32	4	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	29	2556	138	248	3302	54	257	197	167	57	32	73
Arrive On Green	0.02	0.52	0.51	0.14	0.64	0.63	0.07	0.11	0.11	0.03	0.06	0.06
Sat Flow, veh/h	1781	4958	268	1781	5174	85	3456	1870	1585	1781	512	1151
Grp Volume(v), veh/h	8	1142	612	197	997	544	168	4	94	32	0	13
Grp Sat Flow(s),veh/h/ln	1781	1702	1822	1781	1702	1855	1728	1870	1585	1781	0	1663
Q Serve(g_s), s	0.4	19.4	19.5	8.5	11.9	11.9	3.8	0.2	4.5	1.4	0.0	0.6
Cycle Q Clear(g_c), s	0.4	19.4	19.5	8.5	11.9	11.9	3.8	0.2	4.5	1.4	0.0	0.6
Prop In Lane	1.00		0.15	1.00		0.05	1.00		1.00	1.00		0.69
Lane Grp Cap(c), veh/h	29	1755	939	248	2173	1184	257	197	167	57	0	105
V/C Ratio(X)	0.27	0.65	0.65	0.79	0.46	0.46	0.65	0.02	0.56	0.56	0.00	0.12
Avail Cap(c_a), veh/h	135	2702	1446	337	3087	1682	588	1107	938	191	0	880
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.6	14.0	14.1	33.1	7.3	7.4	35.7	31.8	33.8	37.9	0.0	35.1
Incr Delay (d2), s/veh	4.9	0.4	0.8	8.9	0.2	0.3	2.8	0.0	2.9	8.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	6.8	7.4	4.2	3.6	4.0	1.6	0.1	1.8	0.7	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.5	14.4	14.8	42.0	7.5	7.6	38.6	31.9	36.7	46.4	0.0	35.6
LnGrp LOS	D	B	B	D	A	A	D	C	D	D	A	D
Approach Vol, veh/h		1762			1738			266			45	
Approach Delay, s/veh		14.7			11.4			37.8			43.3	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	12.4	15.1	44.9	10.4	9.0	5.3	54.7
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	8.5	47.0	14.5	62.5	13.5	42.0	5.5	71.5
Max Q Clear Time (g_c+I1), s	2.4	6.5	10.5	21.5	5.8	2.6	2.4	13.9
Green Ext Time (p_c), s	0.0	0.3	0.2	19.0	0.3	0.0	0.0	16.9

Intersection Summary	
HCM 6th Ctrl Delay	15.2
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	0	73	0	56	0	373	36	24	357	0
Future Volume (veh/h)	4	0	0	73	0	56	0	373	36	24	357	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	5	0	0	90	0	69	0	460	44	30	441	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	384	0	0	462	0	201	7	661	63	87	1067	0
Arrive On Green	0.13	0.00	0.00	0.13	0.00	0.13	0.00	0.39	0.37	0.05	0.57	0.00
Sat Flow, veh/h	928	0	0	1424	0	1594	1810	1704	163	1795	1885	0
Grp Volume(v), veh/h	5	0	0	90	0	69	0	0	504	30	441	0
Grp Sat Flow(s),veh/h/ln	928	0	0	1424	0	1594	1810	0	1867	1795	1885	0
Q Serve(g_s), s	0.1	0.0	0.0	0.1	0.0	1.1	0.0	0.0	6.1	0.4	3.6	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.0	1.3	0.0	1.1	0.0	0.0	6.1	0.4	3.6	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	384	0	0	462	0	201	7	0	725	87	1067	0
V/C Ratio(X)	0.01	0.00	0.00	0.19	0.00	0.34	0.00	0.00	0.70	0.35	0.41	0.00
Avail Cap(c_a), veh/h	1989	0	0	2155	0	2097	771	0	4923	1430	5671	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.3	0.0	0.0	10.9	0.0	10.8	0.0	0.0	6.9	12.4	3.3	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	0.4	0.0	0.0	0.5	0.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.3	0.0	0.2	0.0	0.0	0.8	0.2	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.3	0.0	0.0	10.9	0.0	11.1	0.0	0.0	7.4	13.3	3.4	0.0
LnGrp LOS	B	A	A	B	A	B	A	A	A	B	A	A
Approach Vol, veh/h		5			159			504			471	
Approach Delay, s/veh		11.3			11.0			7.4			4.0	
Approach LOS		B			B			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	15.3		6.9	0.0	20.1		6.9				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	21.0	70.7		35.0	11.0	80.7		35.0				
Max Q Clear Time (g_c+I1), s	2.4	8.1		3.2	0.0	5.6		3.3				
Green Ext Time (p_c), s	0.0	1.9		0.0	0.0	1.9		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			6.5									
HCM 6th LOS			A									

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	151	1044	0
Future Volume (veh/h)	0	0	0	151	1044	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	0	0	0	178	1228	-1
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	0	301	0	255	1799	800
Arrive On Green	0.00	0.00	0.00	0.18	0.52	0.00
Sat Flow, veh/h	0	1870	0	1585	3483	1598
Grp Volume(v), veh/h	0	0	0	178	1228	-1
Grp Sat Flow(s),veh/h/ln	0	1870	0	1585	1742	1598
Q Serve(g_s), s	0.0	0.0	0.0	3.3	8.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.3	8.2	0.0
Prop In Lane	0.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	301	0	255	1799	800
V/C Ratio(X)	0.00	0.00	0.00	0.70	0.68	0.00
Avail Cap(c_a), veh/h	0	2911	0	2467	4586	2078
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	12.2	5.6	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	3.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.0	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	15.6	6.1	0.0
LnGrp LOS	A	A	A	B	A	A
Approach Vol, veh/h		0	178		1227	
Approach Delay, s/veh		0.0	15.6		6.1	
Approach LOS			B		A	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	10.3	10.3	21.0
Change Period (Y+Rc), s	5.3	5.3	5.3
Max Green Setting (Gmax), s	48.7	48.7	40.7
Max Q Clear Time (g_c+I1), s	0.0	5.3	10.2
Green Ext Time (p_c), s	0.0	1.1	5.4

Intersection Summary	
HCM 6th Ctrl Delay	7.3
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1311	0	0	147	946	4	5	200	0	0	0
Future Volume (veh/h)	10	1311	0	0	147	946	4	5	200	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	10	1352	0	0	152	506	4	5	79			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	92	3162	0	0	901	1527	148	155	132			
Arrive On Green	0.03	0.61	0.00	0.00	0.48	0.48	0.08	0.08	0.08			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	1767	1856	1572			
Grp Volume(v), veh/h	10	1352	0	0	152	506	4	5	79			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	1856	1572			
Q Serve(g_s), s	0.1	4.4	0.0	0.0	1.5	3.1	0.1	0.1	1.5			
Cycle Q Clear(g_c), s	0.1	4.4	0.0	0.0	1.5	3.1	0.1	0.1	1.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	92	3162	0	0	901	1527	148	155	132			
V/C Ratio(X)	0.11	0.43	0.00	0.00	0.17	0.33	0.03	0.03	0.60			
Avail Cap(c_a), veh/h	1807	12008	0	0	3213	5446	2567	2696	2284			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	15.1	3.2	0.0	0.0	4.7	5.1	13.4	13.4	14.1			
Incr Delay (d2), s/veh	0.5	0.1	0.0	0.0	0.1	0.1	0.1	0.1	4.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	3.3	0.0	0.0	4.8	5.3	13.5	13.5	18.4			
LnGrp LOS	B	A	A	A	A	A	B	B	B			
Approach Vol, veh/h		1362			658			88				
Approach Delay, s/veh		3.4			5.2			17.9				
Approach LOS		A			A			B				

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		24.3		7.5	4.3	20.0						
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3						
Max Green Setting (Gmax), s		73.7		45.7	16.0	53.7						
Max Q Clear Time (g_c+I1), s		6.4		3.5	2.1	5.1						
Green Ext Time (p_c), s		12.7		0.3	0.0	3.0						

Intersection Summary			
HCM 6th Ctrl Delay			4.5
HCM 6th LOS			A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	3.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	115	0	0	0	0	193
Future Vol, veh/h	115	0	0	0	0	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	125	0	0	0	0	210

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	105	105	210	0	-	0
Stage 1	105	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	881	929	1358	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	881	929	1358	-	-	-
Mov Cap-2 Maneuver	881	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1358	-	881	-	-
HCM Lane V/C Ratio	-	-	0.142	-	-
HCM Control Delay (s)	0	-	9.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	29	19	0	21	4	18	205	0	7	338	145
Future Volume (veh/h)	169	29	19	0	21	4	18	205	0	7	338	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	197	34	21	0	24	5	20	223	0	8	367	169
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	249	280	173	2	95	20	41	395	0	633	650	300
Arrive On Green	0.14	0.26	0.25	0.00	0.06	0.06	0.02	0.21	0.00	0.36	0.54	0.54
Sat Flow, veh/h	1781	1082	668	1781	1501	313	1781	1870	0	1781	1212	558
Grp Volume(v), veh/h	197	0	55	0	0	29	20	223	0	8	0	536
Grp Sat Flow(s),veh/h/ln	1781	0	1750	1781	0	1814	1781	1870	0	1781	0	1770
Q Serve(g_s), s	7.7	0.0	1.7	0.0	0.0	1.1	0.8	7.7	0.0	0.2	0.0	14.4
Cycle Q Clear(g_c), s	7.7	0.0	1.7	0.0	0.0	1.1	0.8	7.7	0.0	0.2	0.0	14.4
Prop In Lane	1.00		0.38	1.00		0.17	1.00		0.00	1.00		0.32
Lane Grp Cap(c), veh/h	249	0	454	2	0	115	41	395	0	633	0	950
V/C Ratio(X)	0.79	0.00	0.12	0.00	0.00	0.25	0.49	0.56	0.00	0.01	0.00	0.56
Avail Cap(c_a), veh/h	273	0	586	124	0	468	124	482	0	633	0	950
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.8	0.0	20.4	0.0	0.0	32.0	34.6	25.3	0.0	15.0	0.0	11.0
Incr Delay (d2), s/veh	13.5	0.0	0.1	0.0	0.0	1.1	8.8	1.3	0.0	0.0	0.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	0.7	0.0	0.0	0.5	0.4	3.4	0.0	0.1	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.3	0.0	20.5	0.0	0.0	33.1	43.5	26.6	0.0	15.0	0.0	13.4
LnGrp LOS	D	A	C	A	A	C	D	C	A	B	A	B
Approach Vol, veh/h		252			29			243			544	
Approach Delay, s/veh		38.3			33.1			28.0			13.4	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.5	19.6	0.0	22.6	6.1	43.0	14.0	8.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	25.0	18.5	5.0	23.5	5.0	38.5	10.5	18.0
Max Q Clear Time (g_c+I1), s	2.2	9.7	0.0	3.7	2.8	16.4	9.7	3.1
Green Ext Time (p_c), s	0.0	0.8	0.0	0.2	0.0	3.3	0.0	0.1

Intersection Summary			
HCM 6th Ctrl Delay			23.2
HCM 6th LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	105	56	105	90	86	123	485	220	121	415	88
Future Volume (veh/h)	65	105	56	105	90	86	123	485	220	121	415	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	71	115	27	115	99	69	135	533	222	133	456	92
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	94	186	44	148	159	111	176	822	341	173	983	197
Arrive On Green	0.05	0.13	0.13	0.08	0.16	0.16	0.10	0.33	0.30	0.10	0.33	0.30
Sat Flow, veh/h	1795	1470	345	1781	1013	706	1795	2464	1022	1795	2958	592
Grp Volume(v), veh/h	71	0	142	115	0	168	135	387	368	133	275	273
Grp Sat Flow(s),veh/h/ln	1795	0	1816	1781	0	1719	1795	1791	1695	1795	1791	1760
Q Serve(g_s), s	1.7	0.0	3.3	2.8	0.0	4.1	3.3	8.2	8.3	3.2	5.4	5.5
Cycle Q Clear(g_c), s	1.7	0.0	3.3	2.8	0.0	4.1	3.3	8.2	8.3	3.2	5.4	5.5
Prop In Lane	1.00		0.19	1.00		0.41	1.00		0.60	1.00		0.34
Lane Grp Cap(c), veh/h	94	0	230	148	0	270	176	598	566	173	595	585
V/C Ratio(X)	0.75	0.00	0.62	0.78	0.00	0.62	0.77	0.65	0.65	0.77	0.46	0.47
Avail Cap(c_a), veh/h	444	0	1511	401	0	1392	767	1611	1525	686	1530	1504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.8	0.0	18.4	20.0	0.0	17.5	19.5	12.6	13.0	19.6	11.7	11.9
Incr Delay (d2), s/veh	4.5	0.0	1.0	3.3	0.0	0.9	2.6	0.4	0.5	2.7	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.2	1.1	0.0	1.3	1.2	2.4	2.3	1.2	1.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	0.0	19.4	23.3	0.0	18.4	22.2	13.0	13.4	22.3	11.9	12.1
LnGrp LOS	C	A	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h		213			283			890			681	
Approach Delay, s/veh		21.4			20.4			14.6			14.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	18.8	7.7	9.6	8.4	18.8	6.3	11.0
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0
Max Green Setting (Gmax), s	17.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0
Max Q Clear Time (g_c+I1), s	5.2	10.3	4.8	5.3	5.3	7.5	3.7	6.1
Green Ext Time (p_c), s	0.1	2.8	0.1	0.4	0.1	1.9	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	772	178	191	546	182	237	314	162	261	268	24
Future Volume (veh/h)	67	772	178	191	546	182	237	314	162	261	268	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	70	804	67	199	569	76	247	327	114	272	279	25
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	90	1385	115	247	1713	226	355	572	195	384	756	67
Arrive On Green	0.05	0.29	0.27	0.14	0.38	0.36	0.10	0.22	0.20	0.11	0.23	0.21
Sat Flow, veh/h	1795	4830	400	1781	4565	601	3483	2606	891	3483	3324	296
Grp Volume(v), veh/h	70	570	301	199	422	223	247	223	218	272	149	155
Grp Sat Flow(s),veh/h/ln	1795	1716	1799	1781	1702	1762	1742	1791	1706	1742	1791	1829
Q Serve(g_s), s	2.5	9.3	9.4	7.1	5.8	5.9	4.5	7.2	7.5	4.9	4.6	4.7
Cycle Q Clear(g_c), s	2.5	9.3	9.4	7.1	5.8	5.9	4.5	7.2	7.5	4.9	4.6	4.7
Prop In Lane	1.00		0.22	1.00		0.34	1.00		0.52	1.00		0.16
Lane Grp Cap(c), veh/h	90	984	516	247	1277	661	355	393	374	384	408	416
V/C Ratio(X)	0.78	0.58	0.58	0.81	0.33	0.34	0.70	0.57	0.58	0.71	0.37	0.37
Avail Cap(c_a), veh/h	303	2208	1157	682	2920	1512	747	1125	1072	854	1180	1205
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	19.9	20.1	27.3	14.5	14.8	28.3	22.7	23.1	28.0	21.2	21.4
Incr Delay (d2), s/veh	5.4	0.2	0.4	2.4	0.1	0.1	0.9	0.5	0.5	0.9	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.2	3.5	2.9	1.9	2.0	1.7	2.7	2.7	1.9	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.0	20.1	20.5	29.7	14.6	14.9	29.2	23.2	23.7	28.9	21.5	21.6
LnGrp LOS	D	C	C	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		941			844			688			576	
Approach Delay, s/veh		21.4			18.2			25.5			25.0	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	18.3	13.0	22.7	10.7	18.9	7.3	28.5
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7
Max Q Clear Time (g_c+I1), s	6.9	9.5	9.1	11.4	6.5	6.7	4.5	7.9
Green Ext Time (p_c), s	0.3	1.5	0.2	3.5	0.3	1.0	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	22.1
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	749	52	69	1042	161	149	114	105	325	105	204
Future Volume (veh/h)	169	749	52	69	1042	161	149	114	105	325	105	204
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	178	788	18	73	1097	34	157	120	111	342	111	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	216	2018	46	107	1695	524	196	259	220	440	566	247
Arrive On Green	0.12	0.39	0.39	0.06	0.33	0.33	0.11	0.14	0.13	0.13	0.16	0.16
Sat Flow, veh/h	1781	5134	117	1781	5106	1578	1795	1838	1555	3483	3582	1563
Grp Volume(v), veh/h	178	522	284	73	1097	34	157	117	114	342	111	80
Grp Sat Flow(s),veh/h/ln	1781	1702	1847	1781	1702	1578	1795	1791	1601	1742	1791	1563
Q Serve(g_s), s	5.8	6.5	6.6	2.4	10.9	0.9	5.1	3.6	3.9	5.7	1.6	2.7
Cycle Q Clear(g_c), s	5.8	6.5	6.6	2.4	10.9	0.9	5.1	3.6	3.9	5.7	1.6	2.7
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.97	1.00		1.00
Lane Grp Cap(c), veh/h	216	1338	726	107	1695	524	196	253	226	440	566	247
V/C Ratio(X)	0.82	0.39	0.39	0.68	0.65	0.06	0.80	0.46	0.51	0.78	0.20	0.32
Avail Cap(c_a), veh/h	216	2647	1436	195	3910	1208	196	1302	1164	440	2664	1163
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.5	12.9	12.9	27.4	16.9	13.5	25.8	23.4	23.8	25.2	21.7	22.2
Incr Delay (d2), s/veh	21.0	0.1	0.1	2.8	0.2	0.0	19.0	0.5	0.7	7.9	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	2.0	2.2	1.0	3.5	0.3	3.0	1.4	1.4	2.5	0.6	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.5	13.0	13.1	30.2	17.0	13.6	44.9	23.9	24.5	33.0	21.8	22.5
LnGrp LOS	D	B	B	C	B	B	D	C	C	C	C	C
Approach Vol, veh/h		984			1204			388			533	
Approach Delay, s/veh		19.1			17.7			32.6			29.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	13.2	7.1	28.2	10.0	14.2	10.7	24.5
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	7.0	42.7	6.0	45.7	6.0	43.7	6.7	45.0
Max Q Clear Time (g_c+I1), s	7.7	5.9	4.4	8.6	7.1	4.7	7.8	12.9
Green Ext Time (p_c), s	0.0	0.8	0.0	3.2	0.0	0.5	0.0	5.3

Intersection Summary	
HCM 6th Ctrl Delay	22.0
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1227	92	165	1317	17	115	11	200	19	6	2
Future Volume (veh/h)	6	1227	92	165	1317	17	115	11	200	19	6	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	7	1334	100	179	1432	18	125	12	217	21	7	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	16	2120	159	225	2883	36	220	318	270	42	182	52
Arrive On Green	0.01	0.44	0.44	0.13	0.55	0.55	0.06	0.17	0.17	0.02	0.13	0.13
Sat Flow, veh/h	1781	4846	363	1781	5197	65	3456	1870	1585	1781	1399	400
Grp Volume(v), veh/h	7	937	497	179	938	512	125	12	217	21	0	9
Grp Sat Flow(s),veh/h/ln	1781	1702	1805	1781	1702	1859	1728	1870	1585	1781	0	1798
Q Serve(g_s), s	0.3	15.4	15.4	7.1	12.2	12.2	2.5	0.4	9.5	0.8	0.0	0.3
Cycle Q Clear(g_c), s	0.3	15.4	15.4	7.1	12.2	12.2	2.5	0.4	9.5	0.8	0.0	0.3
Prop In Lane	1.00		0.20	1.00		0.04	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	16	1489	790	225	1888	1031	220	318	270	42	0	235
V/C Ratio(X)	0.43	0.63	0.63	0.80	0.50	0.50	0.57	0.04	0.80	0.50	0.00	0.04
Avail Cap(c_a), veh/h	185	2850	1511	481	3416	1865	454	1087	921	259	0	1070
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.6	15.8	15.8	30.7	9.9	9.9	32.9	25.0	28.8	34.8	0.0	27.5
Incr Delay (d2), s/veh	17.2	0.4	0.8	6.3	0.2	0.4	2.3	0.0	5.6	8.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	5.5	6.0	3.3	4.0	4.4	1.1	0.2	3.9	0.5	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.9	16.2	16.6	36.9	10.1	10.3	35.2	25.1	34.4	43.5	0.0	27.5
LnGrp LOS	D	B	B	D	B	B	D	C	C	D	A	C
Approach Vol, veh/h		1441			1629			354			30	
Approach Delay, s/veh		16.5			13.1			34.4			38.7	
Approach LOS		B			B			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	16.3	13.6	36.1	9.1	13.4	5.2	44.6
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	10.5	42.0	19.5	60.5	9.5	43.0	7.5	72.5
Max Q Clear Time (g_c+I1), s	2.8	11.5	9.1	17.4	4.5	2.3	2.3	14.2
Green Ext Time (p_c), s	0.0	0.8	0.3	14.2	0.1	0.0	0.0	15.2

Intersection Summary	
HCM 6th Ctrl Delay	16.9
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	1	40	90	1	350	40	413	50	420	526	40
Future Volume (veh/h)	90	1	40	90	1	350	40	413	50	420	526	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	111	1	49	111	1	97	49	510	62	519	649	49
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	159	174	133	158	1	145	84	710	86	590	1696	128
Arrive On Green	0.09	0.09	0.08	0.09	0.09	0.09	0.05	0.22	0.21	0.33	0.50	0.49
Sat Flow, veh/h	1810	1900	1604	1795	16	1579	1810	3233	391	1795	3376	255
Grp Volume(v), veh/h	111	1	49	111	0	98	49	284	288	519	344	354
Grp Sat Flow(s),veh/h/ln	1810	1900	1604	1795	0	1595	1810	1805	1819	1795	1791	1839
Q Serve(g_s), s	3.5	0.0	1.7	3.5	0.0	3.5	1.5	8.5	8.5	15.9	6.9	6.9
Cycle Q Clear(g_c), s	3.5	0.0	1.7	3.5	0.0	3.5	1.5	8.5	8.5	15.9	6.9	6.9
Prop In Lane	1.00		1.00	1.00		0.99	1.00		0.22	1.00		0.14
Lane Grp Cap(c), veh/h	159	174	133	158	0	146	84	396	400	590	900	924
V/C Ratio(X)	0.70	0.01	0.37	0.70	0.00	0.67	0.59	0.72	0.72	0.88	0.38	0.38
Avail Cap(c_a), veh/h	280	1161	966	278	0	974	265	814	820	1035	1578	1620
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	24.0	25.2	25.7	0.0	25.5	27.2	21.0	21.1	18.4	8.9	8.9
Incr Delay (d2), s/veh	5.4	0.0	0.6	5.5	0.0	2.0	2.4	0.9	0.9	1.8	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.6	1.6	0.0	1.2	0.7	3.1	3.2	6.1	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.2	24.0	25.8	31.3	0.0	27.5	29.6	21.9	22.0	20.2	9.0	9.0
LnGrp LOS	C	C	C	C	A	C	C	C	C	C	A	A
Approach Vol, veh/h		161			209			621			1217	
Approach Delay, s/veh		29.5			29.5			22.6			13.8	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.6	17.6	9.1	8.8	6.2	34.0	9.1	8.8
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0
Max Green Setting (Gmax), s	33.0	25.7	8.5	35.0	8.0	50.7	8.5	35.0
Max Q Clear Time (g_c+I1), s	17.9	10.5	5.5	3.7	3.5	8.9	5.5	5.5
Green Ext Time (p_c), s	0.8	1.7	0.1	0.1	0.0	3.0	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	109	0	22	37	85	0	53	69	154	18	58
Future Volume (vph)	142	109	0	22	37	85	0	53	69	154	18	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5		4.0			4.0	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00			0.96	1.00
Satd. Flow (prot)	1770	1863		1770	1863	1583		1721			1783	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00			0.96	1.00
Satd. Flow (perm)	1770	1863		1770	1863	1583		1721			1783	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	154	118	0	24	40	92	0	58	75	167	20	63
RTOR Reduction (vph)	0	0	0	0	0	80	0	47	0	0	0	49
Lane Group Flow (vph)	154	118	0	24	40	12	0	86	0	0	187	14
Turn Type	Prot	NA		Prot	NA	Perm		NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	7.9	14.7		0.8	7.6	7.6		10.2			12.3	12.3
Effective Green, g (s)	8.4	15.2		1.3	8.1	7.6		10.7			12.8	12.3
Actuated g/C Ratio	0.15	0.27		0.02	0.14	0.14		0.19			0.23	0.22
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	265	505		41	269	214		328			407	347
v/s Ratio Prot	c0.09	c0.06		0.01	0.02			c0.05			c0.10	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.58	0.23		0.59	0.15	0.06		0.26			0.46	0.04
Uniform Delay, d1	22.2	15.9		27.1	20.9	21.1		19.3			18.6	17.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	3.2	0.2		19.5	0.3	0.1		1.9			3.7	0.2
Delay (s)	25.4	16.1		46.6	21.2	21.2		21.2			22.3	17.4
Level of Service	C	B		D	C	C		C			C	B
Approach Delay (s)		21.4			25.1			21.2			21.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	56.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	324	140	97	192	4
Future Volume (veh/h)	9	324	140	97	192	4
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	352	152	105	209	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	37	784	278	181	1157	1029
Arrive On Green	0.02	0.22	0.13	0.13	0.65	0.65
Sat Flow, veh/h	1781	3647	2159	1341	1781	1585
Grp Volume(v), veh/h	10	352	129	128	209	3
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1629	1781	1585
Q Serve(g_s), s	0.3	5.3	4.2	4.5	2.9	0.0
Cycle Q Clear(g_c), s	0.3	5.3	4.2	4.5	2.9	0.0
Prop In Lane	1.00			0.82	1.00	1.00
Lane Grp Cap(c), veh/h	37	784	240	220	1157	1029
V/C Ratio(X)	0.27	0.45	0.54	0.58	0.18	0.00
Avail Cap(c_a), veh/h	289	2423	808	741	1157	1029
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.7	20.8	24.9	25.2	4.3	3.8
Incr Delay (d2), s/veh	3.8	0.4	1.9	2.4	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.0	1.7	1.7	0.7	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	33.5	21.2	26.8	27.6	4.6	3.8
LnGrp LOS	C	C	C	C	A	A
Approach Vol, veh/h		362	257		212	
Approach Delay, s/veh		21.5	27.2		4.6	
Approach LOS		C	C		A	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	17.6	44.0	5.3	12.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	41.5	39.5	9.5	27.5
Max Q Clear Time (g_c+I1), s	7.3	4.9	2.3	6.5
Green Ext Time (p_c), s	2.2	0.6	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	308	433	240	446	836	138
Future Volume (veh/h)	308	433	240	446	836	138
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	324	456	253	469	880	145
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	380	2998	1157	526	1016	457
Arrive On Green	0.21	0.59	0.33	0.33	0.29	0.29
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598
Grp Volume(v), veh/h	324	456	253	469	880	145
Grp Sat Flow(s),veh/h/ln	1781	1702	1777	1585	1742	1598
Q Serve(g_s), s	14.6	3.4	4.3	23.4	20.0	5.9
Cycle Q Clear(g_c), s	14.6	3.4	4.3	23.4	20.0	5.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	380	2998	1157	526	1016	457
V/C Ratio(X)	0.85	0.15	0.22	0.89	0.87	0.32
Avail Cap(c_a), veh/h	619	5000	2074	935	1595	722
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.5	7.8	20.4	26.5	28.0	23.4
Incr Delay (d2), s/veh	6.3	0.0	0.0	2.3	1.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	1.0	1.6	8.3	7.8	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.8	7.8	20.5	28.7	29.9	23.5
LnGrp LOS	D	A	C	C	C	C
Approach Vol, veh/h		780	722		1025	
Approach Delay, s/veh		20.3	25.8		29.0	
Approach LOS		C	C		C	

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	54.3	21.8	32.5	29.1
Change Period (Y+Rc), s	5.3	4.5	5.3	5.3
Max Green Setting (Gmax), s	81.7	28.5	48.7	37.7
Max Q Clear Time (g_c+I1), s	5.4	16.6	25.4	22.0
Green Ext Time (p_c), s	1.9	0.7	1.7	1.9

Intersection Summary	
HCM 6th Ctrl Delay	25.4
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	345	961	0	0	447	1091	176	3	181	0	0	0
Future Volume (veh/h)	345	961	0	0	447	1091	176	3	181	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	356	991	0	0	461	780	183	0	83			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	590	3233	0	0	691	1172	423	0	188			
Arrive On Green	0.17	0.63	0.00	0.00	0.37	0.37	0.12	0.00	0.12			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	356	991	0	0	461	780	183	0	83			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	3.6	3.4	0.0	0.0	7.8	7.8	1.8	0.0	1.9			
Cycle Q Clear(g_c), s	3.6	3.4	0.0	0.0	7.8	7.8	1.8	0.0	1.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	590	3233	0	0	691	1172	423	0	188			
V/C Ratio(X)	0.60	0.31	0.00	0.00	0.67	0.67	0.43	0.00	0.44			
Avail Cap(c_a), veh/h	1510	10036	0	0	2685	4551	4291	0	1909			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	14.6	3.3	0.0	0.0	10.1	10.1	15.6	0.0	15.6			
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.0	0.4	0.2	0.3	0.0	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.1	0.2	0.0	0.0	2.0	1.6	0.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.0	3.3	0.0	0.0	10.5	10.3	15.8	0.0	16.2			
LnGrp LOS	B	A	A	A	B	B	B	A	B			
Approach Vol, veh/h		1347			1241			266				
Approach Delay, s/veh		6.4			10.4			15.9				
Approach LOS		A			B			B				
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		28.7		9.4	9.9	18.8						
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3						
Max Green Setting (Gmax), s		73.7		45.7	16.0	53.7						
Max Q Clear Time (g_c+I1), s		5.4		3.9	5.6	9.8						
Green Ext Time (p_c), s		4.7		0.4	0.5	3.7						

Intersection Summary			
HCM 6th Ctrl Delay			9.0
HCM 6th LOS			A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	6.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	0	0	0	0	2
Future Vol, veh/h	7	0	0	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	0	0	0	0	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1	1	2	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	1021	1083	1619	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1021	1083	1619	-	-	-
Mov Cap-2 Maneuver	1021	-	-	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1619	-	1021	-	-
HCM Lane V/C Ratio	-	-	0.007	-	-
HCM Control Delay (s)	0	-	8.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	215	40	132	0	40	10	45	287	0	10	126	156
Future Volume (veh/h)	215	40	132	0	40	10	45	287	0	10	126	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	250	47	153	0	47	12	52	334	0	12	147	181
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	268	749	634	5	202	52	124	861	384	52	717	320
Arrive On Green	0.15	0.40	0.40	0.00	0.14	0.13	0.07	0.24	0.00	0.03	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	1437	367	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	250	47	153	0	0	59	52	334	0	12	147	181
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1804	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.1	0.6	2.3	0.0	0.0	1.1	1.0	2.9	0.0	0.2	1.3	3.8
Cycle Q Clear(g_c), s	5.1	0.6	2.3	0.0	0.0	1.1	1.0	2.9	0.0	0.2	1.3	3.8
Prop In Lane	1.00		1.00	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	268	749	634	5	0	254	124	861	384	52	717	320
V/C Ratio(X)	0.93	0.06	0.24	0.00	0.00	0.23	0.42	0.39	0.00	0.23	0.20	0.57
Avail Cap(c_a), veh/h	268	946	802	268	0	913	268	1895	845	268	1895	845
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.4	6.7	7.3	0.0	0.0	14.0	16.3	11.6	0.0	17.3	12.2	13.2
Incr Delay (d2), s/veh	37.5	0.0	0.2	0.0	0.0	0.5	2.2	0.3	0.0	2.2	0.1	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.2	0.6	0.0	0.0	0.4	0.4	0.8	0.0	0.1	0.4	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.8	6.8	7.5	0.0	0.0	14.5	18.5	11.9	0.0	19.5	12.3	14.7
LnGrp LOS	D	A	A	A	A	B	B	B	A	B	B	B
Approach Vol, veh/h		450			59			386			340	
Approach Delay, s/veh		32.6			14.5			12.8			13.8	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.1	12.9	0.0	18.6	6.6	11.4	9.5	9.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.2	4.9	0.0	4.3	3.0	5.8	7.1	3.1
Green Ext Time (p_c), s	0.0	1.6	0.0	0.6	0.0	1.1	0.0	0.2

Intersection Summary		
HCM 6th Ctrl Delay		20.4
HCM 6th LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	180	182	268	170	150	108	670	217	146	942	60
Future Volume (veh/h)	120	180	182	268	170	150	108	670	217	146	942	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	132	198	178	295	187	147	119	736	225	160	1035	63
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	162	219	197	324	320	252	147	859	263	190	1173	71
Arrive On Green	0.09	0.24	0.24	0.18	0.33	0.33	0.08	0.32	0.31	0.11	0.34	0.33
Sat Flow, veh/h	1795	908	816	1781	961	756	1795	2698	825	1795	3424	208
Grp Volume(v), veh/h	132	0	376	295	0	334	119	489	472	160	541	557
Grp Sat Flow(s),veh/h/ln	1795	0	1724	1781	0	1717	1795	1791	1732	1795	1791	1841
Q Serve(g_s), s	7.6	0.0	22.2	17.0	0.0	16.9	6.8	26.8	26.9	9.2	29.9	29.9
Cycle Q Clear(g_c), s	7.6	0.0	22.2	17.0	0.0	16.9	6.8	26.8	26.9	9.2	29.9	29.9
Prop In Lane	1.00		0.47	1.00		0.44	1.00		0.48	1.00		0.11
Lane Grp Cap(c), veh/h	162	0	416	324	0	572	147	570	552	190	614	631
V/C Ratio(X)	0.82	0.00	0.90	0.91	0.00	0.58	0.81	0.86	0.86	0.84	0.88	0.88
Avail Cap(c_a), veh/h	257	0	558	340	0	638	154	649	627	205	700	719
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.9	0.0	38.6	42.1	0.0	29.0	47.4	33.5	33.8	46.1	32.5	32.6
Incr Delay (d2), s/veh	5.0	0.0	12.6	26.0	0.0	0.5	24.0	9.0	9.3	22.9	10.7	10.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	10.4	9.5	0.0	6.7	3.9	12.4	12.1	5.2	13.9	14.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.9	0.0	51.2	68.1	0.0	29.5	71.4	42.5	43.1	68.9	43.2	43.0
LnGrp LOS	D	A	D	E	A	C	E	D	D	E	D	D
Approach Vol, veh/h		508			629			1080			1258	
Approach Delay, s/veh		51.4			47.6			46.0			46.4	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.1	37.4	23.1	29.3	12.6	40.0	13.4	39.0
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0
Max Green Setting (Gmax), s	12.0	36.7	20.0	34.0	9.0	39.7	15.0	39.0
Max Q Clear Time (g_c+I1), s	11.2	28.9	19.0	24.2	8.8	31.9	9.6	18.9
Green Ext Time (p_c), s	0.0	2.4	0.1	1.0	0.0	2.7	0.1	1.1

Intersection Summary	
HCM 6th Ctrl Delay	47.2
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	681	327	266	930	290	392	337	167	340	565	20
Future Volume (veh/h)	30	681	327	266	930	290	392	337	167	340	565	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	35	792	110	309	1081	118	456	392	142	395	657	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	44	1206	166	338	2010	219	516	698	249	460	905	29
Arrive On Green	0.02	0.27	0.25	0.19	0.43	0.42	0.15	0.27	0.26	0.13	0.26	0.24
Sat Flow, veh/h	1795	4536	624	1781	4666	509	3483	2568	917	3483	3538	113
Grp Volume(v), veh/h	35	597	305	309	788	411	456	272	262	395	332	346
Grp Sat Flow(s),veh/h/ln	1795	1716	1729	1781	1702	1770	1742	1791	1693	1742	1791	1860
Q Serve(g_s), s	2.2	17.6	17.9	19.4	19.5	19.6	14.6	14.8	15.3	12.6	19.3	19.3
Cycle Q Clear(g_c), s	2.2	17.6	17.9	19.4	19.5	19.6	14.6	14.8	15.3	12.6	19.3	19.3
Prop In Lane	1.00		0.36	1.00		0.29	1.00		0.54	1.00		0.06
Lane Grp Cap(c), veh/h	44	912	460	338	1466	763	516	487	461	460	458	476
V/C Ratio(X)	0.79	0.65	0.66	0.91	0.54	0.54	0.88	0.56	0.57	0.86	0.73	0.73
Avail Cap(c_a), veh/h	95	1145	577	422	1764	917	581	613	580	612	629	653
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.2	37.2	37.5	45.2	24.0	24.2	47.5	35.6	36.0	48.4	38.7	38.8
Incr Delay (d2), s/veh	10.8	0.4	1.0	19.2	0.1	0.2	12.8	0.4	0.4	7.4	1.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	7.2	7.5	10.1	7.4	7.8	7.1	6.3	6.2	5.8	8.3	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.0	37.6	38.5	64.5	24.1	24.4	60.4	36.0	36.5	55.8	40.1	40.1
LnGrp LOS	E	D	D	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		937			1508			990			1073	
Approach Delay, s/veh		39.0			32.5			47.3			45.9	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	35.0	25.6	34.3	20.9	33.1	6.8	53.1
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7
Max Q Clear Time (g_c+I1), s	14.6	17.3	21.4	19.9	16.6	21.3	4.2	21.6
Green Ext Time (p_c), s	0.4	1.8	0.2	3.3	0.3	2.1	0.0	5.3

Intersection Summary	
HCM 6th Ctrl Delay	40.3
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	185	1134	128	182	1131	240	112	103	95	548	154	114
Future Volume (veh/h)	185	1134	128	182	1131	240	112	103	95	548	154	114
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	208	1274	73	204	1271	109	126	116	107	616	173	15
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	246	2030	116	128	1762	545	129	244	205	669	904	396
Arrive On Green	0.14	0.41	0.41	0.07	0.35	0.35	0.07	0.13	0.12	0.19	0.25	0.25
Sat Flow, veh/h	1781	4936	283	1781	5106	1578	1795	1841	1551	3483	3582	1569
Grp Volume(v), veh/h	208	879	468	204	1271	109	126	113	110	616	173	15
Grp Sat Flow(s),veh/h/ln	1781	1702	1814	1781	1702	1578	1795	1791	1601	1742	1791	1569
Q Serve(g_s), s	9.5	17.1	17.1	6.0	18.1	4.0	5.8	4.8	5.4	14.4	3.2	0.6
Cycle Q Clear(g_c), s	9.5	17.1	17.1	6.0	18.1	4.0	5.8	4.8	5.4	14.4	3.2	0.6
Prop In Lane	1.00		0.16	1.00		1.00	1.00		0.97	1.00		1.00
Lane Grp Cap(c), veh/h	246	1400	746	128	1762	545	129	237	212	669	904	396
V/C Ratio(X)	0.84	0.63	0.63	1.59	0.72	0.20	0.97	0.48	0.52	0.92	0.19	0.04
Avail Cap(c_a), veh/h	342	2331	1242	128	2883	891	129	968	866	669	2367	1036
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	19.4	19.4	38.6	23.8	19.2	38.5	33.4	34.3	33.0	24.4	23.5
Incr Delay (d2), s/veh	9.7	0.2	0.3	298.6	0.2	0.1	70.5	0.6	0.7	17.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	6.0	6.4	13.1	6.6	1.4	5.0	2.0	2.0	7.3	1.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.7	19.6	19.8	337.2	24.0	19.2	109.0	34.0	35.0	50.7	24.5	23.5
LnGrp LOS	D	B	B	F	C	B	F	C	D	D	C	C
Approach Vol, veh/h		1555			1584			349			804	
Approach Delay, s/veh		23.0			64.0			61.4			44.6	
Approach LOS		C			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	15.0	10.0	38.2	10.0	25.0	15.5	32.7
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	16.0	43.7	6.0	55.7	6.0	53.7	16.0	45.7
Max Q Clear Time (g_c+I1), s	16.4	7.4	8.0	19.1	7.8	5.2	11.5	20.1
Green Ext Time (p_c), s	0.0	0.7	0.0	6.2	0.0	0.7	0.1	6.3

Intersection Summary		
HCM 6th Ctrl Delay		45.3
HCM 6th LOS		D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1691	176	254	1521	26	196	10	177	34	14	12
Future Volume (veh/h)	10	1691	176	254	1521	26	196	10	177	34	14	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	1838	191	276	1653	28	213	11	192	37	15	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	32	2437	252	259	3341	57	285	270	229	56	86	75
Arrive On Green	0.02	0.52	0.51	0.15	0.65	0.64	0.08	0.14	0.14	0.03	0.09	0.09
Sat Flow, veh/h	1781	4701	486	1781	5171	88	3456	1870	1585	1781	925	801
Grp Volume(v), veh/h	11	1328	701	276	1088	593	213	11	192	37	0	28
Grp Sat Flow(s),veh/h/ln	1781	1702	1783	1781	1702	1855	1728	1870	1585	1781	0	1726
Q Serve(g_s), s	0.6	31.8	32.2	15.0	17.1	17.2	6.2	0.5	12.2	2.1	0.0	1.5
Cycle Q Clear(g_c), s	0.6	31.8	32.2	15.0	17.1	17.2	6.2	0.5	12.2	2.1	0.0	1.5
Prop In Lane	1.00		0.27	1.00		0.05	1.00		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	32	1765	924	259	2199	1198	285	270	229	56	0	161
V/C Ratio(X)	0.34	0.75	0.76	1.06	0.49	0.49	0.75	0.04	0.84	0.66	0.00	0.17
Avail Cap(c_a), veh/h	104	2081	1090	259	2378	1296	453	853	723	147	0	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.0	19.6	19.7	44.0	9.5	9.5	46.2	38.0	42.9	49.3	0.0	43.1
Incr Delay (d2), s/veh	6.2	1.3	2.6	74.0	0.2	0.3	3.9	0.1	8.0	12.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	12.2	13.3	11.9	5.8	6.4	2.8	0.2	5.2	1.1	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.2	20.9	22.4	118.0	9.7	9.8	50.1	38.0	51.0	61.5	0.0	43.6
LnGrp LOS	E	C	C	F	A	A	D	D	D	E	A	D
Approach Vol, veh/h		2040			1957			416			65	
Approach Delay, s/veh		21.6			25.0			50.2			53.8	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	18.9	19.0	57.4	13.0	13.6	5.9	70.6
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	8.5	47.0	14.5	62.5	13.5	42.0	5.5	71.5
Max Q Clear Time (g_c+I1), s	4.1	14.2	17.0	34.2	8.2	3.5	2.6	19.2
Green Ext Time (p_c), s	0.0	0.7	0.0	18.8	0.3	0.1	0.0	19.2

Intersection Summary	
HCM 6th Ctrl Delay	26.2
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	0	40	110	0	120	100	377	90	100	354	110
Future Volume (veh/h)	110	0	40	110	0	120	100	377	90	100	354	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	136	0	49	136	0	148	123	465	111	123	437	136
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	183	240	203	182	0	202	160	802	190	160	748	231
Arrive On Green	0.10	0.00	0.13	0.10	0.00	0.13	0.09	0.28	0.25	0.09	0.28	0.25
Sat Flow, veh/h	1810	1900	1606	1795	0	1594	1810	2895	686	1795	2695	831
Grp Volume(v), veh/h	136	0	49	136	0	148	123	289	287	123	289	284
Grp Sat Flow(s),veh/h/ln	1810	1900	1606	1795	0	1594	1810	1805	1776	1795	1791	1736
Q Serve(g_s), s	3.1	0.0	1.2	3.1	0.0	3.7	2.8	5.8	5.9	2.8	5.8	6.0
Cycle Q Clear(g_c), s	3.1	0.0	1.2	3.1	0.0	3.7	2.8	5.8	5.9	2.8	5.8	6.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		0.48
Lane Grp Cap(c), veh/h	183	240	203	182	0	202	160	500	492	160	497	482
V/C Ratio(X)	0.75	0.00	0.24	0.75	0.00	0.73	0.77	0.58	0.58	0.77	0.58	0.59
Avail Cap(c_a), veh/h	821	1588	1343	815	0	1332	692	1423	1400	686	1412	1368
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	16.5	18.3	0.0	17.6	18.7	13.0	13.3	18.6	13.0	13.4
Incr Delay (d2), s/veh	5.9	0.0	0.2	6.0	0.0	1.9	2.9	0.4	0.4	2.9	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.3	1.3	0.0	1.2	1.1	1.7	1.7	1.1	2.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	0.0	16.7	24.3	0.0	19.5	21.5	13.4	13.7	21.5	13.4	13.8
LnGrp LOS	C	A	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h		185			284			699			696	
Approach Delay, s/veh		22.2			21.8			15.0			15.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	15.6	9.2	9.3	7.7	15.6	9.2	9.3
Change Period (Y+Rc), s	4.0	5.3	5.0	4.0	4.0	5.3	5.0	4.0
Max Green Setting (Gmax), s	16.0	31.7	19.0	35.0	16.0	31.7	19.0	35.0
Max Q Clear Time (g_c+I1), s	4.8	7.9	5.1	3.2	4.8	8.0	5.1	5.7
Green Ext Time (p_c), s	0.1	1.9	0.3	0.1	0.1	2.3	0.3	0.5

Intersection Summary	
HCM 6th Ctrl Delay	16.7
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	73	0	77	120	198	0	36	45	187	61	193
Future Volume (vph)	93	73	0	77	120	198	0	36	45	187	61	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5		4.0			4.0	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00			0.96	1.00
Satd. Flow (prot)	1770	1863		1770	1863	1583		1723			1795	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00			0.96	1.00
Satd. Flow (perm)	1770	1863		1770	1863	1583		1723			1795	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	79	0	84	130	215	0	39	49	203	66	210
RTOR Reduction (vph)	0	0	0	0	0	175	0	44	0	0	0	149
Lane Group Flow (vph)	101	79	0	84	130	40	0	44	0	0	269	61
Turn Type	Prot	NA		Prot	NA	Perm		NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	6.7	8.7		8.7	10.7	10.7		5.2			16.8	16.8
Effective Green, g (s)	7.2	9.2		9.2	11.2	10.7		5.7			17.3	16.8
Actuated g/C Ratio	0.13	0.16		0.16	0.20	0.19		0.10			0.30	0.29
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	222	298		283	363	295		171			541	463
v/s Ratio Prot	c0.06	0.04		0.05	c0.07			c0.03			c0.15	
v/s Ratio Perm						0.03						0.04
v/c Ratio	0.45	0.27		0.30	0.36	0.14		0.26			0.50	0.13
Uniform Delay, d1	23.3	21.1		21.2	20.0	19.5		23.9			16.5	14.9
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	1.5	0.5		0.6	0.6	0.2		0.8			3.2	0.6
Delay (s)	24.8	21.6		21.8	20.6	19.7		24.7			19.7	15.5
Level of Service	C	C		C	C	B		C			B	B
Approach Delay (s)		23.4			20.4			24.7			17.9	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	57.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	299	385	166	164	10
Future Volume (veh/h)	5	299	385	166	164	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	325	418	180	178	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	26	1159	604	257	977	869
Arrive On Green	0.01	0.33	0.25	0.24	0.55	0.55
Sat Flow, veh/h	1781	3647	2521	1034	1781	1585
Grp Volume(v), veh/h	5	325	305	293	178	7
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1684	1781	1585
Q Serve(g_s), s	0.2	4.3	9.9	10.1	3.2	0.1
Cycle Q Clear(g_c), s	0.2	4.3	9.9	10.1	3.2	0.1
Prop In Lane	1.00			0.61	1.00	1.00
Lane Grp Cap(c), veh/h	26	1159	442	419	977	869
V/C Ratio(X)	0.19	0.28	0.69	0.70	0.18	0.01
Avail Cap(c_a), veh/h	279	2617	919	871	977	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	15.9	21.7	21.9	7.2	6.5
Incr Delay (d2), s/veh	3.6	0.1	1.9	2.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.5	3.8	3.7	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.7	16.1	23.6	24.1	7.6	6.6
LnGrp LOS	C	B	C	C	A	A
Approach Vol, veh/h		330	598		185	
Approach Delay, s/veh		16.4	23.8		7.6	
Approach LOS		B	C		A	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	24.8	39.0	4.9	19.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	46.5	34.5	9.5	32.5
Max Q Clear Time (g_c+I1), s	6.3	5.2	2.2	12.1
Green Ext Time (p_c), s	2.0	0.5	0.0	3.3

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	214	345	523	351	1491	200
Future Volume (veh/h)	214	345	523	351	1491	200
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	225	363	551	369	1569	211
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	171	2153	1005	448	1716	787
Arrive On Green	0.10	0.42	0.28	0.28	0.49	0.49
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598
Grp Volume(v), veh/h	225	363	551	369	1569	211
Grp Sat Flow(s),veh/h/ln	1781	1702	1777	1585	1742	1598
Q Serve(g_s), s	9.0	4.1	12.3	20.4	38.9	7.2
Cycle Q Clear(g_c), s	9.0	4.1	12.3	20.4	38.9	7.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	171	2153	1005	448	1716	787
V/C Ratio(X)	1.31	0.17	0.55	0.82	0.91	0.27
Avail Cap(c_a), veh/h	171	3436	1898	846	2195	1007
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.3	16.9	28.5	31.4	21.9	13.9
Incr Delay (d2), s/veh	176.5	0.0	0.2	1.5	4.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	1.5	4.9	7.4	14.9	2.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	218.9	16.9	28.7	32.8	26.6	13.9
LnGrp LOS	F	B	C	C	C	B
Approach Vol, veh/h		588	920		1780	
Approach Delay, s/veh		94.2	30.3		25.1	
Approach LOS		F	C		C	

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	43.5	13.0	30.5	50.1
Change Period (Y+Rc), s	5.3	4.5	5.3	5.3
Max Green Setting (Gmax), s	61.7	8.5	48.7	57.7
Max Q Clear Time (g_c+I1), s	6.1	11.0	22.4	40.9
Green Ext Time (p_c), s	1.5	0.0	2.8	3.9

Intersection Summary	
HCM 6th Ctrl Delay	38.9
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	248	1596	0	0	496	1058	340	5	276	0	0	0
Future Volume (veh/h)	248	1596	0	0	496	1058	340	5	276	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	256	1645	0	0	511	695	355	0	237			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	407	3034	0	0	723	1225	821	0	365			
Arrive On Green	0.12	0.59	0.00	0.00	0.38	0.38	0.23	0.00	0.23			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	256	1645	0	0	511	695	355	0	237			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	3.1	8.7	0.0	0.0	10.3	7.7	3.8	0.0	6.1			
Cycle Q Clear(g_c), s	3.1	8.7	0.0	0.0	10.3	7.7	3.8	0.0	6.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	407	3034	0	0	723	1225	821	0	365			
V/C Ratio(X)	0.63	0.54	0.00	0.00	0.71	0.57	0.43	0.00	0.65			
Avail Cap(c_a), veh/h	1241	8595	0	0	2309	3913	3699	0	1646			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	18.9	5.6	0.0	0.0	11.7	10.9	14.7	0.0	15.6			
Incr Delay (d2), s/veh	0.6	0.1	0.0	0.0	0.5	0.2	0.1	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.1	1.3	0.0	0.0	3.0	1.9	1.2	0.0	0.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.5	5.6	0.0	0.0	12.2	11.1	14.8	0.0	16.3			
LnGrp LOS	B	A	A	A	B	B	B	A	B			
Approach Vol, veh/h		1901			1206			592				
Approach Delay, s/veh		7.5			11.5			15.4				
Approach LOS		A			B			B				
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		30.5		14.4	9.3	21.2						
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3						
Max Green Setting (Gmax), s		73.7		45.7	16.0	53.7						
Max Q Clear Time (g_c+I1), s		10.7		8.1	5.1	12.3						
Green Ext Time (p_c), s		9.9		1.0	0.3	3.6						
Intersection Summary												
HCM 6th Ctrl Delay			10.1									
HCM 6th LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	3.3					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	0	0	0	0	8
Future Vol, veh/h	5	0	0	0	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	0	0	0	0	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	5	5	9	0	-	0
Stage 1	5	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	1016	1076	1609	-	-	-
Stage 1	1017	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1016	1076	1609	-	-	-
Mov Cap-2 Maneuver	1016	-	-	-	-	-
Stage 1	1017	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1609	-	1016	-	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	0	-	8.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	30	250	0	20	0	71	192	0	10	314	168
Future Volume (veh/h)	190	30	250	0	20	0	71	192	0	10	314	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	202	32	266	0	21	0	76	204	0	11	334	179
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	254	720	610	5	259	0	152	982	438	49	776	346
Arrive On Green	0.14	0.38	0.38	0.00	0.14	0.00	0.09	0.28	0.00	0.03	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	1781	1870	0	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	202	32	266	0	21	0	76	204	0	11	334	179
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	0	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.2	0.4	4.8	0.0	0.4	0.0	1.6	1.7	0.0	0.2	3.1	3.8
Cycle Q Clear(g_c), s	4.2	0.4	4.8	0.0	0.4	0.0	1.6	1.7	0.0	0.2	3.1	3.8
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	254	720	610	5	259	0	152	982	438	49	776	346
V/C Ratio(X)	0.79	0.04	0.44	0.00	0.08	0.00	0.50	0.21	0.00	0.23	0.43	0.52
Avail Cap(c_a), veh/h	254	898	761	254	898	0	254	1798	802	254	1798	802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	7.4	8.8	0.0	14.5	0.0	16.8	10.7	0.0	18.3	13.0	13.3
Incr Delay (d2), s/veh	15.9	0.0	0.5	0.0	0.1	0.0	2.5	0.1	0.0	2.3	0.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.1	1.3	0.0	0.1	0.0	0.6	0.5	0.0	0.1	0.9	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	7.4	9.3	0.0	14.6	0.0	19.4	10.8	0.0	20.6	13.4	14.5
LnGrp LOS	C	A	A	A	B	A	B	B	A	C	B	B
Approach Vol, veh/h		500			21			280			524	
Approach Delay, s/veh		18.3			14.6			13.1			13.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.1	14.6	0.0	18.8	7.3	12.4	9.5	9.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.2	3.7	0.0	6.8	3.6	5.8	6.2	2.4
Green Ext Time (p_c), s	0.0	0.9	0.0	0.8	0.0	2.1	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay		15.4
HCM 6th LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	110	75	153	90	90	145	642	220	290	639	90
Future Volume (veh/h)	70	110	75	153	90	90	145	642	220	290	639	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	75	118	69	165	97	79	156	690	218	312	687	84
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	97	152	89	205	188	153	197	881	278	357	1344	164
Arrive On Green	0.05	0.13	0.13	0.11	0.19	0.19	0.11	0.33	0.31	0.20	0.41	0.40
Sat Flow, veh/h	1810	1124	657	1810	969	789	1810	2699	853	1810	3238	396
Grp Volume(v), veh/h	75	0	187	165	0	176	156	461	447	312	383	388
Grp Sat Flow(s),veh/h/ln	1810	0	1782	1810	0	1758	1810	1805	1747	1810	1805	1829
Q Serve(g_s), s	2.9	0.0	7.1	6.2	0.0	6.3	5.9	16.2	16.3	11.7	11.0	11.1
Cycle Q Clear(g_c), s	2.9	0.0	7.1	6.2	0.0	6.3	5.9	16.2	16.3	11.7	11.0	11.1
Prop In Lane	1.00		0.37	1.00		0.45	1.00		0.49	1.00		0.22
Lane Grp Cap(c), veh/h	97	0	240	205	0	342	197	589	570	357	749	759
V/C Ratio(X)	0.77	0.00	0.78	0.81	0.00	0.51	0.79	0.78	0.78	0.87	0.51	0.51
Avail Cap(c_a), veh/h	284	0	939	258	0	902	490	1029	995	438	977	990
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	0.0	29.3	30.4	0.0	25.3	30.5	21.4	21.7	27.3	15.2	15.4
Incr Delay (d2), s/veh	4.8	0.0	2.1	10.9	0.0	0.4	2.7	0.9	0.9	13.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	2.9	3.1	0.0	2.4	2.5	6.1	6.0	5.9	3.9	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	0.0	31.4	41.3	0.0	25.8	33.2	22.3	22.6	40.5	15.4	15.6
LnGrp LOS	D	A	C	D	A	C	C	C	C	D	B	B
Approach Vol, veh/h		262			341			1064			1083	
Approach Delay, s/veh		33.2			33.3			24.0			22.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.9	26.9	11.9	13.5	11.7	33.1	7.8	17.6
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0
Max Green Setting (Gmax), s	17.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0
Max Q Clear Time (g_c+I1), s	13.7	18.3	8.2	9.1	7.9	13.1	4.9	8.3
Green Ext Time (p_c), s	0.2	3.3	0.0	0.6	0.1	2.7	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	25.5
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	881	362	310	720	230	262	369	263	350	356	30
Future Volume (veh/h)	70	881	362	310	720	230	262	369	263	350	356	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	73	918	127	323	750	103	273	384	170	365	371	27
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	95	1297	179	358	1977	269	349	547	239	442	858	62
Arrive On Green	0.05	0.28	0.27	0.20	0.43	0.41	0.10	0.23	0.21	0.13	0.25	0.24
Sat Flow, veh/h	1810	4590	632	1810	4616	629	3510	2432	1060	3510	3411	247
Grp Volume(v), veh/h	73	691	354	323	560	293	273	283	271	365	196	202
Grp Sat Flow(s),veh/h/ln	1810	1729	1764	1810	1729	1787	1755	1805	1687	1755	1805	1853
Q Serve(g_s), s	3.8	17.0	17.2	16.5	10.5	10.7	7.2	13.7	14.1	9.6	8.6	8.7
Cycle Q Clear(g_c), s	3.8	17.0	17.2	16.5	10.5	10.7	7.2	13.7	14.1	9.6	8.6	8.7
Prop In Lane	1.00		0.36	1.00		0.35	1.00		0.63	1.00		0.13
Lane Grp Cap(c), veh/h	95	977	498	358	1481	765	349	406	380	442	454	466
V/C Ratio(X)	0.77	0.71	0.71	0.90	0.38	0.38	0.78	0.70	0.71	0.83	0.43	0.43
Avail Cap(c_a), veh/h	210	1530	781	477	2040	1054	518	780	729	592	818	840
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	30.5	30.8	37.1	18.5	18.7	41.7	33.8	34.3	40.5	29.8	29.9
Incr Delay (d2), s/veh	4.9	0.4	0.7	14.1	0.1	0.1	2.4	0.8	0.9	5.4	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	6.7	7.0	8.3	3.9	4.1	3.1	5.8	5.6	4.3	3.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.4	30.9	31.5	51.3	18.6	18.8	44.1	34.6	35.3	45.8	30.1	30.2
LnGrp LOS	D	C	C	D	B	B	D	C	D	D	C	C
Approach Vol, veh/h		1118			1176			827			763	
Approach Delay, s/veh		32.3			27.6			38.0			37.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.9	25.4	22.8	30.8	13.4	27.9	9.0	44.7
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7
Max Q Clear Time (g_c+I1), s	11.6	16.1	18.5	19.2	9.2	10.7	5.8	12.7
Green Ext Time (p_c), s	0.3	1.9	0.3	4.2	0.2	1.3	0.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	33.1
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	171	756	66	90	1055	161	190	131	165	325	111	208
Future Volume (veh/h)	171	756	66	90	1055	161	190	131	165	325	111	208
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	180	796	32	95	1111	34	200	138	174	342	117	84
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	203	1845	74	135	1678	518	185	316	281	413	688	301
Arrive On Green	0.11	0.37	0.37	0.08	0.33	0.33	0.10	0.18	0.17	0.12	0.19	0.19
Sat Flow, veh/h	1781	5033	202	1781	5106	1578	1795	1791	1595	3483	3582	1566
Grp Volume(v), veh/h	180	538	290	95	1111	34	200	138	174	342	117	84
Grp Sat Flow(s),veh/h/ln	1781	1702	1830	1781	1702	1578	1795	1791	1595	1742	1791	1566
Q Serve(g_s), s	6.3	7.5	7.5	3.3	11.8	0.9	6.5	4.3	6.4	6.1	1.7	2.9
Cycle Q Clear(g_c), s	6.3	7.5	7.5	3.3	11.8	0.9	6.5	4.3	6.4	6.1	1.7	2.9
Prop In Lane	1.00		0.11	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	1248	671	135	1678	518	185	316	281	413	688	301
V/C Ratio(X)	0.89	0.43	0.43	0.70	0.66	0.07	1.08	0.44	0.62	0.83	0.17	0.28
Avail Cap(c_a), veh/h	203	2488	1338	183	3676	1136	185	1224	1090	413	2505	1095
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	15.1	15.1	28.5	18.2	14.6	28.3	23.2	24.3	27.2	21.3	21.8
Incr Delay (d2), s/veh	33.3	0.1	0.2	3.5	0.2	0.0	90.1	0.4	0.8	12.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	2.4	2.6	1.4	3.9	0.3	7.1	1.7	2.2	3.0	0.6	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.9	15.1	15.2	32.0	18.4	14.6	118.5	23.6	25.1	39.5	21.4	22.0
LnGrp LOS	E	B	B	C	B	B	F	C	C	D	C	C
Approach Vol, veh/h		1008			1240			512			543	
Approach Delay, s/veh		23.3			19.3			61.2			32.9	
Approach LOS		C			B			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	15.9	8.3	28.0	10.0	16.9	10.7	25.6
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	7.0	42.7	6.0	45.7	6.0	43.7	6.7	45.0
Max Q Clear Time (g_c+I1), s	8.1	8.4	5.3	9.5	8.5	4.9	8.3	13.8
Green Ext Time (p_c), s	0.0	1.1	0.0	3.3	0.0	0.5	0.0	5.3

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1294	92	165	1351	17	115	11	202	19	6	2
Future Volume (veh/h)	6	1294	92	165	1351	17	115	11	202	19	6	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	7	1407	100	179	1468	18	125	12	220	21	7	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	16	2188	156	223	2943	36	211	319	270	42	186	53
Arrive On Green	0.01	0.45	0.45	0.13	0.57	0.57	0.06	0.17	0.17	0.02	0.13	0.13
Sat Flow, veh/h	1781	4866	346	1781	5199	64	3456	1870	1585	1781	1399	400
Grp Volume(v), veh/h	7	984	523	179	961	525	125	12	220	21	0	9
Grp Sat Flow(s),veh/h/ln	1781	1702	1808	1781	1702	1859	1728	1870	1585	1781	0	1798
Q Serve(g_s), s	0.3	17.0	17.0	7.4	12.9	12.9	2.7	0.4	10.1	0.9	0.0	0.3
Cycle Q Clear(g_c), s	0.3	17.0	17.0	7.4	12.9	12.9	2.7	0.4	10.1	0.9	0.0	0.3
Prop In Lane	1.00		0.19	1.00		0.03	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	16	1531	813	223	1927	1052	211	319	270	42	0	239
V/C Ratio(X)	0.43	0.64	0.64	0.80	0.50	0.50	0.59	0.04	0.81	0.50	0.00	0.04
Avail Cap(c_a), veh/h	176	2716	1442	458	3254	1777	433	1036	878	247	0	1020
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.4	16.2	16.2	32.2	10.0	10.0	34.7	26.3	30.3	36.6	0.0	28.6
Incr Delay (d2), s/veh	17.4	0.5	0.9	6.5	0.2	0.4	2.6	0.0	5.9	8.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	6.1	6.6	3.5	4.2	4.7	1.2	0.2	4.2	0.5	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.8	16.6	17.0	38.8	10.2	10.3	37.3	26.3	36.2	45.5	0.0	28.7
LnGrp LOS	D	B	B	D	B	B	D	C	D	D	A	C
Approach Vol, veh/h		1514			1665			357			30	
Approach Delay, s/veh		16.9			13.3			36.2			40.5	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	16.9	14.0	38.6	9.1	14.1	5.2	47.4
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	10.5	42.0	19.5	60.5	9.5	43.0	7.5	72.5
Max Q Clear Time (g_c+I1), s	2.9	12.1	9.4	19.0	4.7	2.3	2.3	14.9
Green Ext Time (p_c), s	0.0	0.8	0.3	15.1	0.1	0.0	0.0	15.9

Intersection Summary		
HCM 6th Ctrl Delay		17.4
HCM 6th LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	1	40	90	1	350	40	434	50	420	567	40
Future Volume (veh/h)	90	1	40	90	1	350	40	434	50	420	567	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	111	1	49	111	1	97	49	536	62	519	700	49
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	159	173	133	158	1	145	83	735	85	589	1726	121
Arrive On Green	0.09	0.09	0.08	0.09	0.09	0.09	0.05	0.23	0.22	0.33	0.51	0.50
Sat Flow, veh/h	1810	1900	1604	1795	16	1579	1810	3253	375	1795	3396	238
Grp Volume(v), veh/h	111	1	49	111	0	98	49	297	301	519	369	380
Grp Sat Flow(s),veh/h/ln	1810	1900	1604	1795	0	1595	1810	1805	1823	1795	1791	1842
Q Serve(g_s), s	3.5	0.0	1.7	3.6	0.0	3.5	1.6	9.0	9.1	16.2	7.6	7.6
Cycle Q Clear(g_c), s	3.5	0.0	1.7	3.6	0.0	3.5	1.6	9.0	9.1	16.2	7.6	7.6
Prop In Lane	1.00		1.00	1.00		0.99	1.00		0.21	1.00		0.13
Lane Grp Cap(c), veh/h	159	173	133	158	0	146	83	408	412	589	910	936
V/C Ratio(X)	0.70	0.01	0.37	0.70	0.00	0.67	0.59	0.73	0.73	0.88	0.41	0.41
Avail Cap(c_a), veh/h	275	1139	948	273	0	956	260	798	806	1015	1548	1592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.3	24.5	25.7	26.3	0.0	26.0	27.7	21.2	21.3	18.8	9.0	9.0
Incr Delay (d2), s/veh	5.5	0.0	0.6	5.6	0.0	2.0	2.5	0.9	1.0	2.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.6	1.6	0.0	1.3	0.7	3.4	3.4	6.3	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	24.5	26.3	31.8	0.0	28.0	30.2	22.2	22.3	21.0	9.1	9.2
LnGrp LOS	C	C	C	C	A	C	C	C	C	C	A	A
Approach Vol, veh/h		161			209			647			1268	
Approach Delay, s/veh		30.1			30.0			22.8			14.0	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.9	18.2	9.2	8.9	6.2	34.9	9.2	8.9
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0
Max Green Setting (Gmax), s	33.0	25.7	8.5	35.0	8.0	50.7	8.5	35.0
Max Q Clear Time (g_c+I1), s	18.2	11.1	5.6	3.7	3.6	9.6	5.5	5.5
Green Ext Time (p_c), s	0.8	1.8	0.1	0.1	0.0	3.3	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	109	0	34	37	86	0	187	102	155	64	58
Future Volume (vph)	142	109	0	34	37	86	0	187	102	155	64	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5		4.0			4.0	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00			0.97	1.00
Satd. Flow (prot)	1770	1863		1770	1863	1583		1774			1799	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00			0.97	1.00
Satd. Flow (perm)	1770	1863		1770	1863	1583		1774			1799	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	154	118	0	37	40	93	0	203	111	168	70	63
RTOR Reduction (vph)	0	0	0	0	0	82	0	20	0	0	0	49
Lane Group Flow (vph)	154	118	0	37	40	11	0	294	0	0	238	14
Turn Type	Prot	NA		Prot	NA	Perm		NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	7.9	13.0		1.7	6.8	6.8		10.2			12.3	12.3
Effective Green, g (s)	8.4	13.5		2.2	7.3	6.8		10.7			12.8	12.3
Actuated g/C Ratio	0.15	0.24		0.04	0.13	0.12		0.19			0.23	0.22
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	269	455		70	246	195		343			417	352
v/s Ratio Prot	c0.09	c0.06		0.02	0.02			c0.17			c0.13	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.57	0.26		0.53	0.16	0.06		0.86			0.57	0.04
Uniform Delay, d1	21.7	16.8		26.0	21.2	21.4		21.5			18.8	16.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	2.9	0.3		7.0	0.3	0.1		23.1			5.6	0.2
Delay (s)	24.7	17.1		33.0	21.6	21.5		44.6			24.3	17.0
Level of Service	C	B		C	C	C		D			C	B
Approach Delay (s)		21.4			24.0			44.6			22.8	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	55.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	358	153	97	192	4
Future Volume (veh/h)	9	358	153	97	192	4
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	389	166	105	209	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	37	798	297	178	1151	1024
Arrive On Green	0.02	0.22	0.14	0.13	0.65	0.65
Sat Flow, veh/h	1781	3647	2231	1280	1781	1585
Grp Volume(v), veh/h	10	389	136	135	209	3
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1640	1781	1585
Q Serve(g_s), s	0.3	5.9	4.4	4.8	2.9	0.0
Cycle Q Clear(g_c), s	0.3	5.9	4.4	4.8	2.9	0.0
Prop In Lane	1.00			0.78	1.00	1.00
Lane Grp Cap(c), veh/h	37	798	247	228	1151	1024
V/C Ratio(X)	0.27	0.49	0.55	0.59	0.18	0.00
Avail Cap(c_a), veh/h	288	2411	804	742	1151	1024
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	20.9	24.8	25.2	4.4	3.9
Incr Delay (d2), s/veh	3.8	0.5	1.9	2.4	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.2	1.8	1.8	0.7	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	33.7	21.4	26.8	27.6	4.7	3.9
LnGrp LOS	C	C	C	C	A	A
Approach Vol, veh/h		399	271		212	
Approach Delay, s/veh		21.7	27.2		4.7	
Approach LOS		C	C		A	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				17.9		44.0	5.3	12.6
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				41.5		39.5	9.5	27.5
Max Q Clear Time (g_c+I1), s				7.9		4.9	2.3	6.8
Green Ext Time (p_c), s				2.4		0.6	0.0	1.3

Intersection Summary		
HCM 6th Ctrl Delay		19.3
HCM 6th LOS		B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	333	442	253	447	836	138
Future Volume (veh/h)	333	442	253	447	836	138
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	351	465	266	471	880	145
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	403	3048	1156	525	1007	453
Arrive On Green	0.23	0.60	0.33	0.33	0.29	0.28
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598
Grp Volume(v), veh/h	351	465	266	471	880	145
Grp Sat Flow(s),veh/h/ln	1781	1702	1777	1585	1742	1598
Q Serve(g_s), s	16.8	3.6	4.8	25.1	21.3	6.3
Cycle Q Clear(g_c), s	16.8	3.6	4.8	25.1	21.3	6.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	403	3048	1156	525	1007	453
V/C Ratio(X)	0.87	0.15	0.23	0.90	0.87	0.32
Avail Cap(c_a), veh/h	582	4703	1951	879	1500	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.1	7.9	21.8	28.2	30.0	25.0
Incr Delay (d2), s/veh	9.7	0.0	0.0	4.0	2.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	1.1	1.9	9.3	8.6	2.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.7	7.9	21.9	32.3	32.8	25.2
LnGrp LOS	D	A	C	C	C	C
Approach Vol, veh/h		816	737		1025	
Approach Delay, s/veh		22.9	28.5		31.7	
Approach LOS		C	C		C	

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	58.2	24.1	34.2	30.5
Change Period (Y+Rc), s	5.3	4.5	5.3	5.3
Max Green Setting (Gmax), s	81.7	28.5	48.7	37.7
Max Q Clear Time (g_c+I1), s	5.6	18.8	27.1	23.3
Green Ext Time (p_c), s	2.0	0.7	1.8	1.8

Intersection Summary	
HCM 6th Ctrl Delay	28.0
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	345	970	0	0	452	1091	185	3	182	0	0	0
Future Volume (veh/h)	345	970	0	0	452	1091	185	3	182	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	356	1000	0	0	466	780	193	0	84			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	588	3233	0	0	694	1177	431	0	192			
Arrive On Green	0.17	0.63	0.00	0.00	0.37	0.37	0.12	0.00	0.12			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	356	1000	0	0	466	780	193	0	84			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	3.6	3.4	0.0	0.0	8.0	7.8	1.9	0.0	1.9			
Cycle Q Clear(g_c), s	3.6	3.4	0.0	0.0	8.0	7.8	1.9	0.0	1.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	588	3233	0	0	694	1177	431	0	192			
V/C Ratio(X)	0.61	0.31	0.00	0.00	0.67	0.66	0.45	0.00	0.44			
Avail Cap(c_a), veh/h	1496	9941	0	0	2660	4508	4251	0	1891			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	14.8	3.3	0.0	0.0	10.2	10.1	15.7	0.0	15.6			
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.0	0.4	0.2	0.3	0.0	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.1	0.2	0.0	0.0	2.0	1.7	0.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.2	3.3	0.0	0.0	10.6	10.4	15.9	0.0	16.2			
LnGrp LOS	B	A	A	A	B	B	B	A	B			
Approach Vol, veh/h		1356			1246			277				
Approach Delay, s/veh		6.4			10.5			16.0				
Approach LOS		A			B			B				

Timer - Assigned Phs		2		4	5	6			
Phs Duration (G+Y+Rc), s		28.9		9.5	10.0	18.9			
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3			
Max Green Setting (Gmax), s		73.7		45.7	16.0	53.7			
Max Q Clear Time (g_c+I1), s		5.4		3.9	5.6	10.0			
Green Ext Time (p_c), s		4.7		0.5	0.5	3.7			

Intersection Summary		
HCM 6th Ctrl Delay		9.1
HCM 6th LOS		A

Notes
User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	7.1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	174	0	0	0	0	60
Future Vol, veh/h	174	0	0	0	0	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	189	0	0	0	0	65

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	33	33	65	0	-	0
Stage 1	33	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	976	1033	1535	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	976	1033	1535	-	-	-
Mov Cap-2 Maneuver	976	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1535	-	976	-	-
HCM Lane V/C Ratio	-	-	0.194	-	-
HCM Control Delay (s)	0	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	215	40	136	2	40	10	54	405	8	10	167	156
Future Volume (veh/h)	215	40	136	2	40	10	54	405	8	10	167	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	250	47	158	2	47	12	63	471	9	12	194	181
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	263	506	429	29	200	51	138	905	403	52	732	326
Arrive On Green	0.15	0.27	0.27	0.02	0.14	0.13	0.08	0.25	0.25	0.03	0.21	0.21
Sat Flow, veh/h	1781	1870	1585	1781	1437	367	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	250	47	158	2	0	59	63	471	9	12	194	181
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1804	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.2	0.7	3.0	0.0	0.0	1.1	1.3	4.2	0.2	0.2	1.7	3.8
Cycle Q Clear(g_c), s	5.2	0.7	3.0	0.0	0.0	1.1	1.3	4.2	0.2	0.2	1.7	3.8
Prop In Lane	1.00		1.00	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	506	429	29	0	251	138	905	403	52	732	326
V/C Ratio(X)	0.95	0.09	0.37	0.07	0.00	0.24	0.46	0.52	0.02	0.23	0.27	0.55
Avail Cap(c_a), veh/h	263	929	787	263	0	896	263	1861	830	263	1861	830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.7	10.2	11.0	18.0	0.0	14.3	16.4	11.9	10.4	17.7	12.4	13.3
Incr Delay (d2), s/veh	42.0	0.1	0.5	1.0	0.0	0.5	2.3	0.5	0.0	2.2	0.2	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.2	0.9	0.0	0.0	0.4	0.5	1.2	0.0	0.1	0.5	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.7	10.2	11.5	19.1	0.0	14.8	18.7	12.4	10.4	19.9	12.6	14.7
LnGrp LOS	E	B	B	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h		455			61			543			387	
Approach Delay, s/veh		36.8			14.9			13.1			13.8	
Approach LOS		D			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.1	13.5	4.6	14.1	6.9	11.7	9.5	9.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.2	6.2	2.0	5.0	3.3	5.8	7.2	3.1
Green Ext Time (p_c), s	0.0	2.3	0.0	0.6	0.0	1.4	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	20.8
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	180	182	294	170	150	108	678	230	146	957	60
Future Volume (veh/h)	120	180	182	294	170	150	108	678	230	146	957	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	132	198	165	323	187	135	119	745	226	160	1052	62
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	161	220	183	336	332	240	146	869	264	190	1185	70
Arrive On Green	0.09	0.23	0.23	0.19	0.33	0.33	0.08	0.32	0.31	0.11	0.35	0.33
Sat Flow, veh/h	1795	943	786	1781	1001	723	1795	2704	820	1795	3431	202
Grp Volume(v), veh/h	132	0	363	323	0	322	119	494	477	160	549	565
Grp Sat Flow(s),veh/h/ln	1795	0	1729	1781	0	1723	1795	1791	1733	1795	1791	1843
Q Serve(g_s), s	7.6	0.0	21.6	19.0	0.0	16.3	6.9	27.3	27.4	9.3	30.6	30.7
Cycle Q Clear(g_c), s	7.6	0.0	21.6	19.0	0.0	16.3	6.9	27.3	27.4	9.3	30.6	30.7
Prop In Lane	1.00		0.45	1.00		0.42	1.00		0.47	1.00		0.11
Lane Grp Cap(c), veh/h	161	0	403	336	0	572	146	576	557	190	619	636
V/C Ratio(X)	0.82	0.00	0.90	0.96	0.00	0.56	0.81	0.86	0.86	0.84	0.89	0.89
Avail Cap(c_a), veh/h	254	0	555	336	0	635	153	643	622	203	693	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.4	0.0	39.4	42.6	0.0	29.1	47.8	33.7	34.0	46.5	32.7	32.8
Incr Delay (d2), s/veh	5.4	0.0	11.6	38.2	0.0	0.4	24.6	9.4	9.7	23.4	11.5	11.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	10.0	11.6	0.0	6.4	4.0	12.7	12.4	5.2	14.4	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.8	0.0	51.1	80.8	0.0	29.4	72.4	43.1	43.6	69.9	44.2	44.1
LnGrp LOS	D	A	D	F	A	C	E	D	D	E	D	D
Approach Vol, veh/h		495			645			1090			1274	
Approach Delay, s/veh		51.5			55.1			46.5			47.4	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.2	38.0	24.0	28.7	12.6	40.6	13.5	39.2
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0
Max Green Setting (Gmax), s	12.0	36.7	20.0	34.0	9.0	39.7	15.0	39.0
Max Q Clear Time (g_c+I1), s	11.3	29.4	21.0	23.6	8.9	32.7	9.6	18.3
Green Ext Time (p_c), s	0.0	2.4	0.0	1.0	0.0	2.6	0.1	1.1

Intersection Summary	
HCM 6th Ctrl Delay	49.1
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	692	338	266	963	298	398	339	167	343	569	20
Future Volume (veh/h)	30	692	338	266	963	298	398	339	167	343	569	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	35	805	123	309	1120	128	463	394	142	399	662	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	44	1194	181	337	2004	229	521	700	249	463	904	29
Arrive On Green	0.02	0.27	0.26	0.19	0.43	0.42	0.15	0.27	0.26	0.13	0.26	0.24
Sat Flow, veh/h	1795	4470	677	1781	4640	530	3483	2571	914	3483	3539	112
Grp Volume(v), veh/h	35	616	312	309	821	427	463	273	263	399	335	348
Grp Sat Flow(s),veh/h/ln	1795	1716	1716	1781	1702	1766	1742	1791	1694	1742	1791	1861
Q Serve(g_s), s	2.2	18.5	18.9	19.7	20.9	21.0	15.1	15.1	15.5	13.0	19.8	19.8
Cycle Q Clear(g_c), s	2.2	18.5	18.9	19.7	20.9	21.0	15.1	15.1	15.5	13.0	19.8	19.8
Prop In Lane	1.00		0.39	1.00		0.30	1.00		0.54	1.00		0.06
Lane Grp Cap(c), veh/h	44	917	458	337	1470	763	521	487	461	463	457	475
V/C Ratio(X)	0.79	0.67	0.68	0.92	0.56	0.56	0.89	0.56	0.57	0.86	0.73	0.73
Avail Cap(c_a), veh/h	93	1128	564	416	1738	902	573	604	572	603	620	644
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.0	37.8	38.2	45.9	24.6	24.8	48.2	36.1	36.6	49.1	39.4	39.5
Incr Delay (d2), s/veh	10.8	0.7	1.5	20.0	0.1	0.2	13.9	0.4	0.4	8.1	1.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	7.6	7.8	10.3	8.0	8.4	7.3	6.4	6.3	6.0	8.6	8.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.8	38.5	39.6	65.9	24.7	25.0	62.1	36.5	37.0	57.2	41.0	41.0
LnGrp LOS	E	D	D	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		963			1557			999			1082	
Approach Delay, s/veh		39.9			33.0			48.5			47.0	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.3	35.4	25.9	34.9	21.3	33.5	6.9	53.9
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7
Max Q Clear Time (g_c+I1), s	15.0	17.5	21.7	20.9	17.1	21.8	4.2	23.0
Green Ext Time (p_c), s	0.4	1.8	0.2	3.4	0.2	2.2	0.0	5.6

Intersection Summary	
HCM 6th Ctrl Delay	41.1
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	1165	174	249	1158	240	140	114	131	548	173	123
Future Volume (veh/h)	195	1165	174	249	1158	240	140	114	131	548	173	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	205	1226	168	262	1219	82	147	120	42	577	182	29
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	246	1825	250	141	1756	543	143	302	102	665	811	355
Arrive On Green	0.14	0.40	0.40	0.08	0.34	0.34	0.08	0.11	0.10	0.19	0.23	0.23
Sat Flow, veh/h	1781	4531	621	1781	5106	1578	1795	2631	883	3483	3582	1568
Grp Volume(v), veh/h	205	921	473	262	1219	82	147	80	82	577	182	29
Grp Sat Flow(s),veh/h/ln	1781	1702	1748	1781	1702	1578	1795	1791	1723	1742	1791	1568
Q Serve(g_s), s	8.5	16.7	16.7	6.0	15.5	2.7	6.0	3.1	3.4	12.1	3.1	1.1
Cycle Q Clear(g_c), s	8.5	16.7	16.7	6.0	15.5	2.7	6.0	3.1	3.4	12.1	3.1	1.1
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	246	1371	704	141	1756	543	143	206	198	665	811	355
V/C Ratio(X)	0.83	0.67	0.67	1.85	0.69	0.15	1.03	0.39	0.41	0.87	0.22	0.08
Avail Cap(c_a), veh/h	377	2568	1319	141	3177	982	143	1067	1026	738	2608	1141
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.7	18.5	18.5	34.8	21.4	17.1	34.8	31.0	31.4	29.6	23.8	23.0
Incr Delay (d2), s/veh	5.4	0.2	0.4	409.2	0.2	0.0	83.8	0.4	0.5	9.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	5.7	5.9	18.5	5.5	0.9	5.8	1.3	1.3	5.5	1.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.1	18.7	18.9	444.0	21.5	17.2	118.5	31.4	31.9	38.8	23.9	23.1
LnGrp LOS	D	B	B	F	C	B	F	C	C	D	C	C
Approach Vol, veh/h		1599			1563			309			788	
Approach Delay, s/veh		21.1			92.1			73.0			34.8	
Approach LOS		C			F			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.4	12.7	10.0	34.4	10.0	21.1	14.5	30.0
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	16.0	43.7	6.0	55.7	6.0	53.7	16.0	45.7
Max Q Clear Time (g_c+I1), s	14.1	5.4	8.0	18.7	8.0	5.1	10.5	17.5
Green Ext Time (p_c), s	0.3	0.5	0.0	6.7	0.0	0.7	0.1	6.0

Intersection Summary	
HCM 6th Ctrl Delay	53.5
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1758	176	254	1615	26	196	10	178	34	14	12
Future Volume (veh/h)	10	1758	176	254	1615	26	196	10	178	34	14	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	1911	191	276	1755	28	213	11	193	37	15	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	32	2479	246	254	3364	54	283	270	229	56	87	75
Arrive On Green	0.02	0.53	0.52	0.14	0.65	0.65	0.08	0.14	0.14	0.03	0.09	0.09
Sat Flow, veh/h	1781	4721	469	1781	5177	83	3456	1870	1585	1781	925	801
Grp Volume(v), veh/h	11	1374	728	276	1154	629	213	11	193	37	0	28
Grp Sat Flow(s),veh/h/ln	1781	1702	1786	1781	1702	1855	1728	1870	1585	1781	0	1726
Q Serve(g_s), s	0.6	33.9	34.4	15.0	18.9	18.9	6.3	0.5	12.5	2.2	0.0	1.6
Cycle Q Clear(g_c), s	0.6	33.9	34.4	15.0	18.9	18.9	6.3	0.5	12.5	2.2	0.0	1.6
Prop In Lane	1.00		0.26	1.00		0.04	1.00		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	32	1787	938	254	2212	1206	283	270	229	56	0	162
V/C Ratio(X)	0.35	0.77	0.78	1.09	0.52	0.52	0.75	0.04	0.84	0.66	0.00	0.17
Avail Cap(c_a), veh/h	102	2037	1069	254	2328	1269	443	835	708	144	0	689
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.1	19.9	20.1	45.1	9.8	9.8	47.3	38.8	43.9	50.4	0.0	44.0
Incr Delay (d2), s/veh	6.4	1.6	3.2	81.9	0.2	0.4	4.0	0.1	8.2	12.6	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	13.1	14.4	12.3	6.5	7.1	2.9	0.2	5.4	1.2	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.5	21.5	23.3	127.0	10.0	10.1	51.3	38.8	52.1	63.0	0.0	44.5
LnGrp LOS	E	C	C	F	A	B	D	D	D	E	A	D
Approach Vol, veh/h		2113			2059			417			65	
Approach Delay, s/veh		22.3			25.7			51.3			55.0	
Approach LOS		C			C			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	19.2	19.0	59.3	13.1	13.9	5.9	72.4
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	8.5	47.0	14.5	62.5	13.5	42.0	5.5	71.5
Max Q Clear Time (g_c+I1), s	4.2	14.5	17.0	36.4	8.3	3.6	2.6	20.9
Green Ext Time (p_c), s	0.0	0.7	0.0	18.4	0.3	0.1	0.0	21.0

Intersection Summary	
HCM 6th Ctrl Delay	26.9
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	0	40	110	0	120	100	467	90	100	430	110
Future Volume (veh/h)	110	0	40	110	0	120	100	467	90	100	430	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	136	0	49	136	0	148	123	577	111	123	531	136
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	182	240	203	182	0	202	161	906	174	160	849	217
Arrive On Green	0.10	0.00	0.13	0.10	0.00	0.13	0.09	0.30	0.27	0.09	0.30	0.27
Sat Flow, veh/h	1810	1900	1606	1795	0	1594	1810	3021	580	1795	2826	721
Grp Volume(v), veh/h	136	0	49	136	0	148	123	344	344	123	336	331
Grp Sat Flow(s),veh/h/ln	1810	1900	1606	1795	0	1594	1810	1805	1796	1795	1791	1755
Q Serve(g_s), s	3.2	0.0	1.2	3.3	0.0	4.0	2.9	7.3	7.4	3.0	7.2	7.3
Cycle Q Clear(g_c), s	3.2	0.0	1.2	3.3	0.0	4.0	2.9	7.3	7.4	3.0	7.2	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.32	1.00		0.41
Lane Grp Cap(c), veh/h	182	240	203	182	0	202	161	541	539	160	538	528
V/C Ratio(X)	0.75	0.00	0.24	0.75	0.00	0.73	0.77	0.64	0.64	0.77	0.62	0.63
Avail Cap(c_a), veh/h	775	1499	1268	769	0	1258	653	1343	1336	648	1333	1306
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	0.0	17.5	19.4	0.0	18.6	19.8	13.4	13.6	19.7	13.4	13.6
Incr Delay (d2), s/veh	6.0	0.0	0.2	6.0	0.0	1.9	2.9	0.5	0.5	2.9	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.4	1.4	0.0	1.3	1.1	2.2	2.3	1.2	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	0.0	17.7	25.4	0.0	20.6	22.6	13.9	14.1	22.6	13.8	14.1
LnGrp LOS	C	A	B	C	A	C	C	B	B	C	B	B
Approach Vol, veh/h		185			284			811			790	
Approach Delay, s/veh		23.3			22.9			15.3			15.3	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	17.3	9.5	9.6	7.9	17.3	9.5	9.6
Change Period (Y+Rc), s	4.0	5.3	5.0	4.0	4.0	5.3	5.0	4.0
Max Green Setting (Gmax), s	16.0	31.7	19.0	35.0	16.0	31.7	19.0	35.0
Max Q Clear Time (g_c+I1), s	5.0	9.4	5.3	3.2	4.9	9.3	5.2	6.0
Green Ext Time (p_c), s	0.1	2.3	0.3	0.1	0.1	2.8	0.3	0.5

Intersection Summary	
HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	73	0	114	120	201	0	123	68	190	209	193
Future Volume (vph)	93	73	0	114	120	201	0	123	68	190	209	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.5		4.0			4.0	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00			0.98	1.00
Satd. Flow (prot)	1770	1863		1770	1863	1583		1773			1819	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00			0.98	1.00
Satd. Flow (perm)	1770	1863		1770	1863	1583		1773			1819	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	79	0	124	130	218	0	134	74	207	227	210
RTOR Reduction (vph)	0	0	0	0	0	182	0	21	0	0	0	154
Lane Group Flow (vph)	101	79	0	124	130	36	0	187	0	0	434	56
Turn Type	Prot	NA		Prot	NA	Perm		NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	7.1	9.8		7.0	9.7	9.7		8.9			15.8	15.8
Effective Green, g (s)	7.6	10.3		7.5	10.2	9.7		9.4			16.3	15.8
Actuated g/C Ratio	0.13	0.17		0.13	0.17	0.16		0.16			0.27	0.27
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	226	322		223	319	258		280			498	420
v/s Ratio Prot	0.06	0.04		c0.07	c0.07			c0.11			c0.24	
v/s Ratio Perm						0.02						0.04
v/c Ratio	0.45	0.25		0.56	0.41	0.14		0.67			0.87	0.13
Uniform Delay, d1	24.0	21.2		24.4	22.0	21.3		23.6			20.6	16.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	1.4	0.4		3.0	0.9	0.2		5.9			18.6	0.7
Delay (s)	25.4	21.6		27.4	22.8	21.6		29.5			39.2	17.3
Level of Service	C	C		C	C	C		C			D	B
Approach Delay (s)		23.8			23.4			29.5			32.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	59.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	325	425	166	164	10
Future Volume (veh/h)	5	325	425	166	164	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	353	462	180	178	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	26	1199	655	253	961	855
Arrive On Green	0.01	0.34	0.26	0.25	0.54	0.54
Sat Flow, veh/h	1781	3647	2598	968	1781	1585
Grp Volume(v), veh/h	5	353	327	315	178	7
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1696	1781	1585
Q Serve(g_s), s	0.2	4.7	10.8	11.0	3.3	0.1
Cycle Q Clear(g_c), s	0.2	4.7	10.8	11.0	3.3	0.1
Prop In Lane	1.00			0.57	1.00	1.00
Lane Grp Cap(c), veh/h	26	1199	464	443	961	855
V/C Ratio(X)	0.20	0.29	0.70	0.71	0.19	0.01
Avail Cap(c_a), veh/h	274	2574	904	862	961	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	15.8	21.7	21.9	7.7	6.9
Incr Delay (d2), s/veh	3.7	0.1	2.0	2.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.7	4.2	4.1	1.0	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	35.3	16.0	23.6	24.0	8.1	6.9
LnGrp LOS	D	B	C	C	A	A
Approach Vol, veh/h		358	642		185	
Approach Delay, s/veh		16.2	23.8		8.0	
Approach LOS		B	C		A	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	25.9	39.0	4.9	21.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	46.5	34.5	9.5	32.5
Max Q Clear Time (g_c+I1), s	6.7	5.3	2.2	13.0
Green Ext Time (p_c), s	2.2	0.5	0.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
6: Sand Creek Road & State Route 4 (EB Ramps)

Albers Ranch
Near Term Plus Project PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	231	354	563	354	1491	200
Future Volume (veh/h)	231	354	563	354	1491	200
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	243	373	593	373	1569	211
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	169	2162	1017	454	1714	786
Arrive On Green	0.09	0.42	0.29	0.29	0.49	0.49
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598
Grp Volume(v), veh/h	243	373	593	373	1569	211
Grp Sat Flow(s),veh/h/ln	1781	1702	1777	1585	1742	1598
Q Serve(g_s), s	9.0	4.3	13.5	20.8	39.5	7.3
Cycle Q Clear(g_c), s	9.0	4.3	13.5	20.8	39.5	7.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	169	2162	1017	454	1714	786
V/C Ratio(X)	1.44	0.17	0.58	0.82	0.92	0.27
Avail Cap(c_a), veh/h	169	3394	1875	836	2168	995
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.9	17.0	29.0	31.6	22.2	14.1
Incr Delay (d2), s/veh	226.8	0.0	0.2	1.4	4.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.4	1.6	5.4	7.6	15.2	2.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	269.7	17.0	29.2	33.0	27.2	14.2
LnGrp LOS	F	B	C	C	C	B
Approach Vol, veh/h		616	966		1780	
Approach Delay, s/veh		116.7	30.7		25.6	
Approach LOS		F	C		C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		44.1			13.0	31.1		50.6
Change Period (Y+Rc), s		5.3			4.5	5.3		5.3
Max Green Setting (Gmax), s		61.7			8.5	48.7		57.7
Max Q Clear Time (g_c+I1), s		6.3			11.0	22.8		41.5
Green Ext Time (p_c), s		1.5			0.0	3.0		3.9

Intersection Summary	
HCM 6th Ctrl Delay	43.8
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	248	1605	0	0	510	1058	368	5	279	0	0	0
Future Volume (veh/h)	248	1605	0	0	510	1058	368	5	279	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	256	1655	0	0	526	695	383	0	240			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	405	3049	0	0	733	1243	825	0	367			
Arrive On Green	0.12	0.59	0.00	0.00	0.39	0.39	0.23	0.00	0.23			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	256	1655	0	0	526	695	383	0	240			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	3.2	8.9	0.0	0.0	10.9	7.8	4.3	0.0	6.3			
Cycle Q Clear(g_c), s	3.2	8.9	0.0	0.0	10.9	7.8	4.3	0.0	6.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	405	3049	0	0	733	1243	825	0	367			
V/C Ratio(X)	0.63	0.54	0.00	0.00	0.72	0.56	0.46	0.00	0.65			
Avail Cap(c_a), veh/h	1214	8406	0	0	2258	3827	3618	0	1610			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	19.4	5.6	0.0	0.0	11.9	11.0	15.1	0.0	15.9			
Incr Delay (d2), s/veh	0.6	0.1	0.0	0.0	0.5	0.1	0.2	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.1	1.3	0.0	0.0	3.2	1.9	1.4	0.0	0.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.0	5.7	0.0	0.0	12.4	11.1	15.3	0.0	16.7			
LnGrp LOS	B	A	A	A	B	B	B	A	B			
Approach Vol, veh/h		1911			1221			623				
Approach Delay, s/veh		7.6			11.7			15.8				
Approach LOS		A			B			B				

Timer - Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		31.2		14.7	9.3	21.9		
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3		
Max Green Setting (Gmax), s		73.7		45.7	16.0	53.7		
Max Q Clear Time (g_c+I1), s		10.9		8.3	5.2	12.9		
Green Ext Time (p_c), s		10.0		1.1	0.3	3.7		

Intersection Summary	
HCM 6th Ctrl Delay	10.3
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	3.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	115	0	0	0	0	193
Future Vol, veh/h	115	0	0	0	0	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	125	0	0	0	0	210

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	105	105	210	0	-	0
Stage 1	105	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	881	929	1358	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	881	929	1358	-	-	-
Mov Cap-2 Maneuver	881	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1358	-	881	-	-
HCM Lane V/C Ratio	-	-	0.142	-	-
HCM Control Delay (s)	0	-	9.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	30	262	7	20	0	80	267	6	10	446	168
Future Volume (veh/h)	190	30	262	7	20	0	80	267	6	10	446	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	202	32	279	7	21	0	85	284	6	11	474	179
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	242	463	393	39	249	0	158	1094	488	48	875	390
Arrive On Green	0.14	0.25	0.25	0.02	0.13	0.00	0.09	0.31	0.31	0.03	0.25	0.25
Sat Flow, veh/h	1781	1870	1585	1781	1870	0	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	202	32	279	7	21	0	85	284	6	11	474	179
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	0	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.5	0.5	6.5	0.2	0.4	0.0	1.8	2.4	0.1	0.2	4.7	3.9
Cycle Q Clear(g_c), s	4.5	0.5	6.5	0.2	0.4	0.0	1.8	2.4	0.1	0.2	4.7	3.9
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	242	463	393	39	249	0	158	1094	488	48	875	390
V/C Ratio(X)	0.83	0.07	0.71	0.18	0.08	0.00	0.54	0.26	0.01	0.23	0.54	0.46
Avail Cap(c_a), veh/h	242	856	726	242	856	0	242	1715	765	242	1715	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	11.6	13.9	19.4	15.3	0.0	17.6	10.5	9.7	19.3	13.2	12.9
Incr Delay (d2), s/veh	21.3	0.1	2.4	2.2	0.1	0.0	2.9	0.1	0.0	2.4	0.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.2	2.1	0.1	0.2	0.0	0.7	0.7	0.0	0.1	1.4	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	11.7	16.3	21.6	15.5	0.0	20.5	10.6	9.7	21.7	13.8	13.8
LnGrp LOS	D	B	B	C	B	A	C	B	A	C	B	B
Approach Vol, veh/h		513			28			375			664	
Approach Delay, s/veh		24.7			17.0			12.9			13.9	
Approach LOS		C			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.1	16.4	4.9	14.0	7.6	13.9	9.5	9.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+I1), s	2.2	4.4	2.2	8.5	3.8	6.7	6.5	2.4				
Green Ext Time (p_c), s	0.0	1.3	0.0	0.8	0.0	2.8	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			17.2									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	110	75	198	90	90	145	679	273	290	670	90
Future Volume (veh/h)	70	110	75	198	90	90	145	679	273	290	670	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	75	118	55	213	97	62	156	730	265	312	720	88
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	97	151	70	234	215	138	195	897	326	352	1401	171
Arrive On Green	0.05	0.12	0.12	0.13	0.20	0.20	0.11	0.35	0.33	0.19	0.43	0.42
Sat Flow, veh/h	1810	1226	571	1810	1083	692	1810	2594	942	1810	3238	396
Grp Volume(v), veh/h	75	0	173	213	0	159	156	508	487	312	401	407
Grp Sat Flow(s),veh/h/ln	1810	0	1797	1810	0	1775	1810	1805	1731	1810	1805	1829
Q Serve(g_s), s	3.2	0.0	7.2	9.0	0.0	6.1	6.5	19.8	19.9	13.0	12.5	12.6
Cycle Q Clear(g_c), s	3.2	0.0	7.2	9.0	0.0	6.1	6.5	19.8	19.9	13.0	12.5	12.6
Prop In Lane	1.00		0.32	1.00		0.39	1.00		0.54	1.00		0.22
Lane Grp Cap(c), veh/h	97	0	221	234	0	353	195	624	598	352	781	791
V/C Ratio(X)	0.77	0.00	0.78	0.91	0.00	0.45	0.80	0.81	0.81	0.89	0.51	0.51
Avail Cap(c_a), veh/h	257	0	860	234	0	827	445	934	895	398	887	899
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.1	0.0	32.9	33.2	0.0	27.3	33.7	23.0	23.4	30.3	16.0	16.1
Incr Delay (d2), s/veh	4.8	0.0	2.3	34.9	0.0	0.3	2.9	2.0	2.1	17.7	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	3.1	5.9	0.0	2.4	2.8	7.8	7.6	6.9	4.5	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.9	0.0	35.2	68.1	0.0	27.6	36.5	25.0	25.4	48.0	16.2	16.3
LnGrp LOS	D	A	D	E	A	C	D	C	C	D	B	B
Approach Vol, veh/h		248			372			1151			1120	
Approach Delay, s/veh		36.9			50.8			26.8			25.1	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.1	30.7	14.0	13.5	12.3	37.5	8.2	19.4
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0
Max Green Setting (Gmax), s	17.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0
Max Q Clear Time (g_c+I1), s	15.0	21.9	11.0	9.2	8.5	14.6	5.2	8.1
Green Ext Time (p_c), s	0.1	3.6	0.0	0.5	0.1	2.8	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	30.1
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	918	384	310	742	236	289	379	263	359	365	30
Future Volume (veh/h)	70	918	384	310	742	236	289	379	263	359	365	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	73	956	150	323	773	109	301	395	170	374	380	27
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	94	1303	204	357	1997	280	372	552	234	446	840	59
Arrive On Green	0.05	0.29	0.28	0.20	0.43	0.42	0.11	0.22	0.21	0.13	0.25	0.23
Sat Flow, veh/h	1810	4503	704	1810	4598	644	3510	2455	1041	3510	3417	242
Grp Volume(v), veh/h	73	733	373	323	580	302	301	289	276	374	200	207
Grp Sat Flow(s),veh/h/ln	1810	1729	1749	1810	1729	1784	1755	1805	1691	1755	1805	1854
Q Serve(g_s), s	3.9	19.0	19.1	17.3	11.3	11.5	8.3	14.6	15.0	10.3	9.3	9.4
Cycle Q Clear(g_c), s	3.9	19.0	19.1	17.3	11.3	11.5	8.3	14.6	15.0	10.3	9.3	9.4
Prop In Lane	1.00		0.40	1.00		0.36	1.00		0.62	1.00		0.13
Lane Grp Cap(c), veh/h	94	1001	506	357	1502	775	372	406	380	446	444	456
V/C Ratio(X)	0.77	0.73	0.74	0.91	0.39	0.39	0.81	0.71	0.73	0.84	0.45	0.45
Avail Cap(c_a), veh/h	201	1465	741	456	1954	1008	496	747	699	567	783	804
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	31.8	32.1	38.9	19.1	19.3	43.3	35.4	36.0	42.3	31.7	31.8
Incr Delay (d2), s/veh	5.0	0.4	0.8	16.2	0.1	0.1	5.3	0.9	1.0	7.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	7.5	7.8	8.9	4.2	4.4	3.7	6.2	6.0	4.7	3.9	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.4	32.2	32.9	55.1	19.1	19.4	48.6	36.3	37.0	49.4	32.0	32.1
LnGrp LOS	D	C	C	E	B	B	D	D	D	D	C	C
Approach Vol, veh/h		1179			1205			866			781	
Approach Delay, s/veh		33.6			28.8			40.8			40.3	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.6	26.3	23.5	32.7	14.5	28.4	9.2	47.1
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7
Max Q Clear Time (g_c+I1), s	12.3	17.0	19.3	21.1	10.3	11.4	5.9	13.5
Green Ext Time (p_c), s	0.3	1.9	0.2	4.4	0.2	1.3	0.0	3.6

Intersection Summary	
HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	319	948	115	81	1216	310	267	479	200	480	215	319
Future Volume (veh/h)	319	948	115	81	1216	310	267	479	200	480	215	319
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	336	998	85	85	1280	128	281	504	150	505	226	198
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	238	1894	161	118	1678	518	259	646	191	428	774	338
Arrive On Green	0.13	0.40	0.40	0.07	0.33	0.33	0.14	0.24	0.23	0.12	0.22	0.22
Sat Flow, veh/h	1781	4787	407	1781	5106	1578	1795	2724	806	3483	3582	1567
Grp Volume(v), veh/h	336	709	374	85	1280	128	281	330	324	505	226	198
Grp Sat Flow(s),veh/h/ln	1781	1702	1790	1781	1702	1578	1795	1791	1739	1742	1791	1567
Q Serve(g_s), s	12.5	14.9	14.9	4.4	21.0	5.5	13.5	16.1	16.3	11.5	4.9	10.6
Cycle Q Clear(g_c), s	12.5	14.9	14.9	4.4	21.0	5.5	13.5	16.1	16.3	11.5	4.9	10.6
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	238	1347	708	118	1678	518	259	425	413	428	774	338
V/C Ratio(X)	1.41	0.53	0.53	0.72	0.76	0.25	1.08	0.78	0.78	1.18	0.29	0.59
Avail Cap(c_a), veh/h	238	1572	827	295	2522	779	259	827	803	428	1578	690
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.5	21.6	21.6	42.8	28.1	22.9	40.0	33.4	33.5	41.0	30.7	32.9
Incr Delay (d2), s/veh	208.2	0.1	0.2	3.0	0.3	0.1	80.2	1.2	1.3	102.4	0.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.0	5.5	5.8	1.9	7.9	1.9	11.4	6.7	6.6	10.8	2.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	248.7	21.7	21.8	45.8	28.5	23.0	120.2	34.5	34.8	143.4	30.8	33.5
LnGrp LOS	F	C	C	D	C	C	F	C	C	F	C	C
Approach Vol, veh/h		1419			1493			935			929	
Approach Delay, s/veh		75.5			29.0			60.4			92.6	
Approach LOS		E			C			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	27.0	9.7	41.8	17.0	25.0	16.0	35.5
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	11.0	42.7	15.0	42.7	13.0	40.7	12.0	45.7
Max Q Clear Time (g_c+I1), s	13.5	18.3	6.4	16.9	15.5	12.6	14.5	23.0
Green Ext Time (p_c), s	0.0	2.3	0.0	4.5	0.0	1.1	0.0	6.2

Intersection Summary	
HCM 6th Ctrl Delay	61.3
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1388	310	820	1527	20	110	10	249	20	10	20
Future Volume (veh/h)	10	1388	310	820	1527	20	110	10	249	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	1461	295	863	1607	12	116	0	151	21	11	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	24	1851	373	986	3694	28	180	0	252	40	86	8
Arrive On Green	0.01	0.43	0.43	0.29	0.71	0.71	0.05	0.00	0.08	0.02	0.05	0.05
Sat Flow, veh/h	1781	4262	858	3456	5228	39	3563	0	3170	1781	1689	154
Grp Volume(v), veh/h	11	1166	590	863	1046	573	116	0	151	21	0	12
Grp Sat Flow(s),veh/h/ln	1781	1702	1716	1728	1702	1863	1781	0	1585	1781	0	1843
Q Serve(g_s), s	0.6	28.9	29.0	23.3	12.8	12.8	3.1	0.0	4.5	1.1	0.0	0.6
Cycle Q Clear(g_c), s	0.6	28.9	29.0	23.3	12.8	12.8	3.1	0.0	4.5	1.1	0.0	0.6
Prop In Lane	1.00		0.50	1.00		0.02	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	24	1479	745	986	2405	1316	180	0	252	40	0	94
V/C Ratio(X)	0.47	0.79	0.79	0.88	0.44	0.44	0.64	0.00	0.60	0.53	0.00	0.13
Avail Cap(c_a), veh/h	100	1756	885	1288	2834	1551	237	0	1295	100	0	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.0	23.8	23.9	33.3	6.1	6.1	45.6	0.0	43.6	47.4	0.0	44.4
Incr Delay (d2), s/veh	13.7	2.1	4.2	5.6	0.1	0.2	3.8	0.0	2.3	10.6	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	10.9	11.5	9.9	3.4	3.7	1.5	0.0	1.8	0.6	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.7	25.9	28.0	39.0	6.2	6.3	49.4	0.0	45.9	57.9	0.0	45.0
LnGrp LOS	E	C	C	D	A	A	D	A	D	E	A	D
Approach Vol, veh/h		1767			2482			267			33	
Approach Delay, s/veh		26.9			17.6			47.4			53.2	
Approach LOS		C			B			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	11.8	32.4	47.0	9.4	9.0	5.8	73.7
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	5.5	40.0	36.5	50.5	6.5	39.0	5.5	81.5
Max Q Clear Time (g_c+I1), s	3.1	6.5	25.3	31.0	5.1	2.6	2.6	14.8
Green Ext Time (p_c), s	0.0	0.6	2.6	11.5	0.0	0.0	0.0	15.8

Intersection Summary			
HCM 6th Ctrl Delay			23.2
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	160	40	84	120	452	20	455	66	560	688	30
Future Volume (veh/h)	90	160	40	84	120	452	20	455	66	560	688	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	95	168	42	88	126	191	21	479	69	589	724	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	140	518	126	135	318	284	52	683	98	777	1434	63
Arrive On Green	0.08	0.18	0.17	0.08	0.18	0.18	0.03	0.22	0.21	0.22	0.41	0.40
Sat Flow, veh/h	1810	2877	701	1795	1791	1595	1810	3163	453	3483	3494	154
Grp Volume(v), veh/h	95	104	106	88	126	191	21	272	276	589	371	385
Grp Sat Flow(s),veh/h/ln	1810	1805	1772	1795	1791	1595	1810	1805	1811	1742	1791	1857
Q Serve(g_s), s	2.9	2.8	3.0	2.7	3.5	6.3	0.6	7.9	8.0	8.9	8.7	8.7
Cycle Q Clear(g_c), s	2.9	2.8	3.0	2.7	3.5	6.3	0.6	7.9	8.0	8.9	8.7	8.7
Prop In Lane	1.00		0.40	1.00		1.00	1.00		0.25	1.00		0.08
Lane Grp Cap(c), veh/h	140	325	319	135	318	284	52	390	391	777	735	762
V/C Ratio(X)	0.68	0.32	0.33	0.65	0.40	0.67	0.40	0.70	0.70	0.76	0.50	0.51
Avail Cap(c_a), veh/h	176	814	799	492	1124	1001	144	963	967	3848	2792	2895
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	20.2	20.3	25.5	20.6	21.7	27.0	20.5	20.6	20.6	12.4	12.4
Incr Delay (d2), s/veh	7.2	0.2	0.2	5.3	0.3	1.0	1.9	0.9	0.9	0.6	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.0	1.1	1.2	1.3	2.1	0.3	2.9	3.0	3.4	3.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.6	20.4	20.5	30.7	20.9	22.8	28.9	21.3	21.4	21.1	12.6	12.6
LnGrp LOS	C	C	C	C	C	C	C	C	C	C	B	B
Approach Vol, veh/h		305			405			569			1345	
Approach Delay, s/veh		24.3			23.9			21.7			16.3	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.1	17.0	9.7	13.7	5.1	28.0	9.9	13.6
Change Period (Y+Rc), s	4.0	5.3	6.0	4.0	4.0	5.3	6.0	4.0
Max Green Setting (Gmax), s	62.0	29.7	15.0	25.0	4.0	87.7	5.0	35.0
Max Q Clear Time (g_c+I1), s	10.9	10.0	4.7	5.0	2.6	10.7	4.9	8.3
Green Ext Time (p_c), s	1.2	1.8	0.1	0.6	0.0	3.3	0.0	1.1

Intersection Summary		
HCM 6th Ctrl Delay		19.6
HCM 6th LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	689	19	90	909	130	50	89	236	120	3	137
Future Volume (veh/h)	98	689	19	90	909	130	50	89	236	120	3	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	725	18	95	957	126	53	94	67	126	3	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	135	1225	30	126	1075	142	76	741	487	159	725	647
Arrive On Green	0.08	0.35	0.34	0.07	0.34	0.34	0.04	0.36	0.36	0.09	0.41	0.40
Sat Flow, veh/h	1781	3543	88	1781	3157	416	1781	2054	1350	1781	1777	1585
Grp Volume(v), veh/h	103	363	380	95	539	544	53	80	81	126	3	44
Grp Sat Flow(s),veh/h/ln	1781	1777	1855	1781	1777	1796	1781	1777	1627	1781	1777	1585
Q Serve(g_s), s	6.8	20.2	20.2	6.3	34.4	34.4	3.5	3.6	4.0	8.3	0.1	2.0
Cycle Q Clear(g_c), s	6.8	20.2	20.2	6.3	34.4	34.4	3.5	3.6	4.0	8.3	0.1	2.0
Prop In Lane	1.00		0.05	1.00		0.23	1.00		0.83	1.00		1.00
Lane Grp Cap(c), veh/h	135	614	641	126	605	612	76	641	587	159	725	647
V/C Ratio(X)	0.76	0.59	0.59	0.76	0.89	0.89	0.70	0.13	0.14	0.79	0.00	0.07
Avail Cap(c_a), veh/h	193	699	729	160	666	673	137	641	587	208	725	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99
Uniform Delay (d), s/veh	54.4	32.3	32.3	54.8	37.4	37.5	56.7	25.7	25.9	53.5	21.1	21.8
Incr Delay (d2), s/veh	10.6	1.0	1.0	14.2	13.3	13.2	11.1	0.4	0.5	14.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	8.5	8.9	3.2	16.5	16.7	1.8	1.6	1.6	4.3	0.1	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.0	33.3	33.3	68.9	50.7	50.7	67.8	26.1	26.4	67.6	21.1	22.0
LnGrp LOS	E	C	C	E	D	D	E	C	C	E	C	C
Approach Vol, veh/h		846			1178			214			173	
Approach Delay, s/veh		37.2			52.2			36.5			55.2	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	47.3	12.5	45.5	9.1	53.0	13.1	44.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	31.5	10.3	46.7	8.7	36.3	12.5	44.5
Max Q Clear Time (g_c+I1), s	10.3	6.0	8.3	22.2	5.5	4.0	8.8	36.4
Green Ext Time (p_c), s	0.1	0.8	0.0	4.3	0.0	0.2	0.1	3.9

Intersection Summary	
HCM 6th Ctrl Delay	45.7
HCM 6th LOS	D

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	91	954	1069	880	310	60
Future Volume (veh/h)	91	954	1069	880	310	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	96	1004	1125	461	326	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	136	2069	1593	699	1045	479
Arrive On Green	0.08	0.58	0.45	0.44	0.30	0.30
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	96	1004	1125	461	326	15
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	3.7	11.4	17.7	15.9	5.0	0.5
Cycle Q Clear(g_c), s	3.7	11.4	17.7	15.9	5.0	0.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	136	2069	1593	699	1045	479
V/C Ratio(X)	0.71	0.49	0.71	0.66	0.31	0.03
Avail Cap(c_a), veh/h	231	3123	2457	1085	1045	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	8.4	15.5	15.3	18.6	17.0
Incr Delay (d2), s/veh	6.5	0.2	0.6	1.1	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	3.2	6.0	4.9	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.8	8.6	16.0	16.4	19.4	17.2
LnGrp LOS	D	A	B	B	B	B
Approach Vol, veh/h		1100	1586		341	
Approach Delay, s/veh		11.2	16.1		19.3	
Approach LOS		B	B		B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	44.4	25.0	9.3	35.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	60.5	20.5	8.5	47.5
Max Q Clear Time (g_c+I1), s	13.4	7.0	5.7	19.7
Green Ext Time (p_c), s	8.1	0.9	0.0	10.9

Intersection Summary	
HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Traffic Volume (veh/h)	353	1051	1837	570	960	192		
Future Volume (veh/h)	353	1051	1837	570	960	192		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No		No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885		
Adj Flow Rate, veh/h	372	1106	1934	396	1011	67		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	1	1		
Cap, veh/h	297	3561	1768	795	760	342		
Arrive On Green	0.17	0.70	0.50	0.50	0.22	0.21		
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598		
Grp Volume(v), veh/h	372	1106	1934	396	1011	67		
Grp Sat Flow(s),veh/h/ln	1781	1702	1777	1585	1742	1598		
Q Serve(g_s), s	20.0	10.0	59.7	19.9	26.2	4.1		
Cycle Q Clear(g_c), s	20.0	10.0	59.7	19.9	26.2	4.1		
Prop In Lane	1.00			1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	297	3561	1768	795	760	342		
V/C Ratio(X)	1.25	0.31	1.09	0.50	1.33	0.20		
Avail Cap(c_a), veh/h	297	3561	1768	795	760	342		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	50.0	7.0	30.1	19.9	46.9	38.7		
Incr Delay (d2), s/veh	138.5	0.0	51.9	0.2	157.2	0.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	20.0	3.1	36.0	6.9	27.5	1.6		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	188.5	7.0	82.1	20.0	204.1	38.8		
LnGrp LOS	F	A	F	C	F	D		
Approach Vol, veh/h		1478	2330		1078			
Approach Delay, s/veh		52.7	71.5		193.9			
Approach LOS		D	E		F			
Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		89.0			24.0	65.0		31.0
Change Period (Y+Rc), s		5.3			4.5	5.3		5.3
Max Green Setting (Gmax), s		83.7			19.5	59.7		25.7
Max Q Clear Time (g_c+I1), s		12.0			22.0	61.7		28.2
Green Ext Time (p_c), s		5.4			0.0	0.0		0.0
Intersection Summary								
HCM 6th Ctrl Delay			92.8					
HCM 6th LOS			F					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	518	1493	0	0	1850	1170	557	10	220	0	0	0
Future Volume (veh/h)	518	1493	0	0	1850	1170	557	10	220	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	545	1572	0	0	1947	770	594	0	114			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	676	3381	0	0	1564	663	747	0	332			
Arrive On Green	0.19	0.66	0.00	0.00	0.41	0.41	0.21	0.00	0.21			
Sat Flow, veh/h	3483	5316	0	0	3770	1598	3534	0	1572			
Grp Volume(v), veh/h	545	1572	0	0	1947	770	594	0	114			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	10.9	11.0	0.0	0.0	30.2	30.2	11.6	0.0	4.5			
Cycle Q Clear(g_c), s	10.9	11.0	0.0	0.0	30.2	30.2	11.6	0.0	4.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	676	3381	0	0	1564	663	747	0	332			
V/C Ratio(X)	0.81	0.46	0.00	0.00	1.25	1.16	0.80	0.00	0.34			
Avail Cap(c_a), veh/h	1028	3902	0	0	1564	663	2679	0	1192			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	28.0	6.2	0.0	0.0	21.3	21.3	27.2	0.0	24.4			
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.0	115.8	88.9	0.7	0.0	0.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.2	2.5	0.0	0.0	36.2	25.7	4.5	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	6.2	0.0	0.0	137.1	110.2	28.0	0.0	24.6			
LnGrp LOS	C	A	A	A	F	F	C	A	C			
Approach Vol, veh/h		2117			2717			708				
Approach Delay, s/veh		12.2			129.5			27.4				
Approach LOS		B			F			C				

Timer - Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		52.6		20.2	17.6	35.0		
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3		
Max Green Setting (Gmax), s		54.7		54.7	21.0	29.7		
Max Q Clear Time (g_c+I1), s		13.0		13.6	12.9	32.2		
Green Ext Time (p_c), s		8.9		1.3	0.7	0.0		

Intersection Summary	
HCM 6th Ctrl Delay	71.7
HCM 6th LOS	E

Notes
User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	33	0	0	230	70	5
Future Vol, veh/h	33	0	0	230	70	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	0	0	242	74	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	198	40	79	0	-	0
Stage 1	77	-	-	-	-	-
Stage 2	121	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	772	1022	1517	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	772	1022	1517	-	-	-
Mov Cap-2 Maneuver	772	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	891	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1517	-	772	-	-
HCM Lane V/C Ratio	-	-	0.045	-	-
HCM Control Delay (s)	0	-	9.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	60	60	18	50	20	30	350	12	20	264	161
Future Volume (veh/h)	273	60	60	18	50	20	30	350	12	20	264	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	297	65	65	20	54	22	33	380	13	22	287	175
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	468	397	69	174	71	94	812	362	73	771	344
Arrive On Green	0.15	0.25	0.25	0.04	0.14	0.12	0.05	0.23	0.23	0.04	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	1781	1263	515	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	297	65	65	20	0	76	33	380	13	22	287	175
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1778	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.5	1.0	1.2	0.4	0.0	1.4	0.6	3.4	0.2	0.4	2.5	3.5
Cycle Q Clear(g_c), s	5.5	1.0	1.2	0.4	0.0	1.4	0.6	3.4	0.2	0.4	2.5	3.5
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	468	397	69	0	244	94	812	362	73	771	344
V/C Ratio(X)	1.10	0.14	0.16	0.29	0.00	0.31	0.35	0.47	0.04	0.30	0.37	0.51
Avail Cap(c_a), veh/h	270	954	809	270	0	907	270	1911	852	270	1911	852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.4	10.6	10.6	16.9	0.0	14.2	16.6	12.1	10.9	16.9	12.1	12.5
Incr Delay (d2), s/veh	84.0	0.1	0.2	2.3	0.0	0.7	2.2	0.4	0.0	2.3	0.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.3	0.3	0.2	0.0	0.5	0.3	0.9	0.1	0.2	0.7	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.4	10.7	10.8	19.2	0.0	14.9	18.8	12.5	10.9	19.1	12.4	13.7
LnGrp LOS	F	B	B	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h		427			96			426			484	
Approach Delay, s/veh		72.4			15.8			12.9			13.2	
Approach LOS		E			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.5	12.3	5.4	13.1	5.9	11.9	9.5	9.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.4	5.4	2.4	3.2	2.6	5.5	7.5	3.4
Green Ext Time (p_c), s	0.0	1.9	0.0	0.4	0.0	1.8	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	30.9
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	210	212	176	210	160	148	821	181	150	1190	140
Future Volume (veh/h)	140	210	212	176	210	160	148	821	181	150	1190	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	152	228	208	191	228	157	161	892	184	163	1293	149
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	173	248	226	173	283	195	139	1140	235	173	1308	150
Arrive On Green	0.10	0.27	0.27	0.10	0.27	0.27	0.08	0.38	0.37	0.10	0.40	0.39
Sat Flow, veh/h	1810	908	828	1810	1038	715	1810	2978	614	1810	3254	373
Grp Volume(v), veh/h	152	0	436	191	0	385	161	541	535	163	714	728
Grp Sat Flow(s),veh/h/ln	1810	0	1736	1810	0	1753	1810	1805	1787	1810	1805	1822
Q Serve(g_s), s	8.7	0.0	25.5	10.0	0.0	21.4	8.0	27.6	27.7	9.4	40.9	41.6
Cycle Q Clear(g_c), s	8.7	0.0	25.5	10.0	0.0	21.4	8.0	27.6	27.7	9.4	40.9	41.6
Prop In Lane	1.00		0.48	1.00		0.41	1.00		0.34	1.00		0.20
Lane Grp Cap(c), veh/h	173	0	474	173	0	478	139	691	684	173	725	732
V/C Ratio(X)	0.88	0.00	0.92	1.10	0.00	0.81	1.16	0.78	0.78	0.94	0.98	0.99
Avail Cap(c_a), veh/h	173	0	565	173	0	570	139	691	684	173	725	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.6	0.0	36.9	47.3	0.0	35.4	48.3	28.4	28.6	47.0	30.9	31.3
Incr Delay (d2), s/veh	35.3	0.0	17.2	98.7	0.0	5.9	126.7	5.3	5.4	50.9	29.4	31.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	12.5	9.1	0.0	9.4	8.4	12.1	12.1	6.5	22.2	23.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.9	0.0	54.2	145.9	0.0	41.3	174.9	33.7	34.0	97.8	60.3	62.9
LnGrp LOS	F	A	D	F	A	D	F	C	C	F	E	E
Approach Vol, veh/h		588			576			1237			1605	
Approach Delay, s/veh		61.3			76.0			52.3			65.3	
Approach LOS		E			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	44.0	14.0	32.5	12.0	46.0	14.0	32.5
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0
Max Green Setting (Gmax), s	10.0	38.7	10.0	34.0	8.0	40.7	10.0	34.0
Max Q Clear Time (g_c+I1), s	11.4	29.7	12.0	27.5	10.0	43.6	10.7	23.4
Green Ext Time (p_c), s	0.0	3.0	0.0	0.9	0.0	0.0	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	62.2
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	753	309	305	945	304	465	418	153	388	602	30
Future Volume (veh/h)	40	753	309	305	945	304	465	418	153	388	602	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	43	818	83	332	1027	122	505	454	143	422	654	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	56	1226	124	359	1996	237	556	733	229	483	883	40
Arrive On Green	0.03	0.26	0.25	0.20	0.43	0.41	0.16	0.27	0.26	0.14	0.25	0.24
Sat Flow, veh/h	1810	4758	479	1810	4692	556	3510	2690	839	3510	3509	161
Grp Volume(v), veh/h	43	593	308	332	756	393	505	303	294	422	336	348
Grp Sat Flow(s),veh/h/ln	1810	1729	1779	1810	1729	1791	1755	1805	1724	1755	1805	1865
Q Serve(g_s), s	2.8	18.4	18.6	21.5	19.2	19.4	16.9	17.6	17.9	14.1	20.5	20.5
Cycle Q Clear(g_c), s	2.8	18.4	18.6	21.5	19.2	19.4	16.9	17.6	17.9	14.1	20.5	20.5
Prop In Lane	1.00		0.27	1.00		0.31	1.00		0.49	1.00		0.09
Lane Grp Cap(c), veh/h	56	891	459	359	1471	762	556	492	470	483	454	469
V/C Ratio(X)	0.77	0.67	0.67	0.92	0.51	0.52	0.91	0.62	0.63	0.87	0.74	0.74
Avail Cap(c_a), veh/h	91	1100	566	409	1707	884	558	589	563	588	604	624
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.5	39.7	40.0	47.0	25.2	25.4	49.4	38.0	38.4	50.5	41.1	41.2
Incr Delay (d2), s/veh	8.3	0.6	1.3	23.7	0.1	0.2	18.4	0.6	0.8	10.5	2.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	7.6	8.0	11.7	7.5	7.9	8.6	7.6	7.5	6.7	9.1	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.8	40.3	41.3	70.7	25.3	25.6	67.8	38.6	39.2	61.0	43.2	43.2
LnGrp LOS	E	D	D	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		944			1481			1102			1106	
Approach Delay, s/veh		41.8			35.6			52.2			50.0	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.4	36.6	27.7	34.8	22.9	34.1	7.7	54.8
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7
Max Q Clear Time (g_c+I1), s	16.1	19.9	23.5	20.6	18.9	22.5	4.8	21.4
Green Ext Time (p_c), s	0.3	1.9	0.2	3.2	0.0	2.1	0.0	5.0

Intersection Summary	
HCM 6th Ctrl Delay	44.2
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	1396	156	154	1197	320	261	412	289	510	317	139
Future Volume (veh/h)	329	1396	156	154	1197	320	261	412	289	510	317	139
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	336	1424	150	157	1221	123	266	420	198	520	323	28
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	316	1722	181	192	1521	470	301	522	244	543	747	327
Arrive On Green	0.18	0.37	0.37	0.11	0.30	0.30	0.17	0.22	0.22	0.16	0.21	0.21
Sat Flow, veh/h	1781	4684	493	1781	5106	1577	1795	2370	1105	3483	3582	1567
Grp Volume(v), veh/h	336	1035	539	157	1221	123	266	316	302	520	323	28
Grp Sat Flow(s),veh/h/ln	1781	1702	1773	1781	1702	1577	1795	1791	1684	1742	1791	1567
Q Serve(g_s), s	20.5	31.9	31.9	10.0	25.5	6.9	16.7	19.3	19.7	17.1	9.1	1.7
Cycle Q Clear(g_c), s	20.5	31.9	31.9	10.0	25.5	6.9	16.7	19.3	19.7	17.1	9.1	1.7
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.66	1.00		1.00
Lane Grp Cap(c), veh/h	316	1252	652	192	1521	470	301	395	371	543	747	327
V/C Ratio(X)	1.06	0.83	0.83	0.82	0.80	0.26	0.88	0.80	0.81	0.96	0.43	0.09
Avail Cap(c_a), veh/h	316	1451	756	270	2044	631	327	670	630	543	1248	546
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.5	33.2	33.2	50.4	37.4	30.8	46.9	42.6	42.9	48.3	39.7	36.8
Incr Delay (d2), s/veh	67.9	3.1	5.8	8.7	1.2	0.1	22.5	1.5	1.7	28.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.7	12.9	14.0	4.8	10.3	2.5	9.1	8.4	8.1	9.3	3.9	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	115.4	36.3	39.0	59.0	38.6	31.0	69.5	44.1	44.6	76.4	39.9	36.8
LnGrp LOS	F	D	D	E	D	C	E	D	D	E	D	D
Approach Vol, veh/h		1910			1501			884			871	
Approach Delay, s/veh		51.0			40.1			51.9			61.6	
Approach LOS		D			D			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.0	30.2	16.0	47.2	23.3	28.9	24.0	39.2				
Change Period (Y+Rc), s	4.5	5.3	4.0	5.3	4.5	5.3	4.0	5.3				
Max Green Setting (Gmax), s	17.5	42.7	17.0	48.7	20.5	39.7	20.0	45.7				
Max Q Clear Time (g_c+I1), s	19.1	21.7	12.0	33.9	18.7	11.1	22.5	27.5				
Green Ext Time (p_c), s	0.0	2.1	0.1	6.1	0.1	1.2	0.0	5.5				
Intersection Summary												
HCM 6th Ctrl Delay			49.8									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	2095	170	401	1311	20	330	10	819	30	10	20
Future Volume (veh/h)	30	2095	170	401	1311	20	330	10	819	30	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	2205	173	422	1380	20	347	0	537	32	11	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	51	2466	192	483	3222	47	385	0	497	51	120	22
Arrive On Green	0.03	0.51	0.51	0.14	0.62	0.62	0.11	0.00	0.16	0.03	0.08	0.08
Sat Flow, veh/h	1781	4832	375	3456	5186	75	3563	0	3170	1781	1540	280
Grp Volume(v), veh/h	32	1547	831	422	906	494	347	0	537	32	0	13
Grp Sat Flow(s),veh/h/ln	1781	1702	1803	1728	1702	1857	1781	0	1585	1781	0	1820
Q Serve(g_s), s	1.9	43.4	44.6	12.7	14.6	14.6	10.3	0.0	12.4	1.9	0.0	0.7
Cycle Q Clear(g_c), s	1.9	43.4	44.6	12.7	14.6	14.6	10.3	0.0	12.4	1.9	0.0	0.7
Prop In Lane	1.00		0.21	1.00		0.04	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	51	1737	920	483	2115	1154	385	0	497	51	0	141
V/C Ratio(X)	0.63	0.89	0.90	0.87	0.43	0.43	0.90	0.00	1.08	0.63	0.00	0.09
Avail Cap(c_a), veh/h	159	1774	939	503	2115	1154	385	0	1369	92	0	683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.2	23.4	23.7	44.9	10.4	10.4	46.9	0.0	24.6	51.2	0.0	45.6
Incr Delay (d2), s/veh	11.8	6.0	11.8	15.2	0.1	0.3	23.7	0.0	44.4	11.8	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	16.9	19.9	6.3	4.8	5.2	5.8	0.0	7.5	1.0	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.0	29.4	35.5	60.1	10.5	10.7	70.7	0.0	69.0	63.0	0.0	45.9
LnGrp LOS	E	C	D	E	B	B	E	A	F	E	A	D
Approach Vol, veh/h		2410			1822			884			45	
Approach Delay, s/veh		31.9			22.1			69.6			58.1	
Approach LOS		C			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	20.7	19.4	58.9	16.0	12.3	7.6	70.7
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	5.5	46.0	15.5	55.5	11.5	40.0	9.5	61.5
Max Q Clear Time (g_c+I1), s	3.9	14.4	14.7	46.6	12.3	2.7	3.9	16.6
Green Ext Time (p_c), s	0.0	2.3	0.1	7.7	0.0	0.0	0.0	11.7

Intersection Summary	
HCM 6th Ctrl Delay	35.1
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	140	40	124	280	421	60	585	73	372	350	40
Future Volume (veh/h)	80	140	40	124	280	421	60	585	73	372	350	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	84	147	22	131	295	235	63	616	71	392	368	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	133	615	90	188	434	336	96	846	97	567	1218	118
Arrive On Green	0.07	0.19	0.19	0.10	0.23	0.23	0.05	0.26	0.25	0.16	0.37	0.36
Sat Flow, veh/h	1810	3156	464	1795	1919	1487	1810	3257	375	3483	3298	321
Grp Volume(v), veh/h	84	83	86	131	275	255	63	341	346	392	199	205
Grp Sat Flow(s),veh/h/ln	1810	1805	1816	1795	1791	1615	1810	1805	1827	1742	1791	1827
Q Serve(g_s), s	2.6	2.2	2.3	4.0	8.0	8.3	1.9	9.8	9.8	6.0	4.5	4.5
Cycle Q Clear(g_c), s	2.6	2.2	2.3	4.0	8.0	8.3	1.9	9.8	9.8	6.0	4.5	4.5
Prop In Lane	1.00		0.26	1.00		0.92	1.00		0.21	1.00		0.18
Lane Grp Cap(c), veh/h	133	352	354	188	405	365	96	469	474	567	661	675
V/C Ratio(X)	0.63	0.24	0.24	0.70	0.68	0.70	0.66	0.73	0.73	0.69	0.30	0.30
Avail Cap(c_a), veh/h	223	1127	1134	632	1528	1378	143	1531	1549	1869	2338	2386
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	19.3	19.4	24.6	20.1	20.2	26.4	19.2	19.3	22.5	12.7	12.8
Incr Delay (d2), s/veh	4.9	0.1	0.1	4.6	0.7	0.9	2.8	0.8	0.8	0.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.8	0.8	1.7	2.9	2.7	0.8	3.5	3.6	2.3	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	19.4	19.5	29.2	20.8	21.1	29.2	20.0	20.1	23.0	12.8	12.9
LnGrp LOS	C	B	B	C	C	C	C	C	C	C	B	B
Approach Vol, veh/h		253			661			750			796	
Approach Delay, s/veh		23.1			22.6			20.8			17.9	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	19.6	10.0	14.6	6.5	25.8	8.2	16.4
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0
Max Green Setting (Gmax), s	30.0	47.7	19.5	35.0	4.0	73.7	6.5	48.0
Max Q Clear Time (g_c+I1), s	8.0	11.8	6.0	4.3	3.9	6.5	4.6	10.3
Green Ext Time (p_c), s	0.7	2.4	0.2	0.5	0.0	1.6	0.0	1.9

Intersection Summary	
HCM 6th Ctrl Delay	20.6
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	669	80	240	729	190	69	70	182	120	44	137
Future Volume (veh/h)	136	669	80	240	729	190	69	70	182	120	44	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	143	704	84	253	767	200	73	74	192	126	46	144
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	176	816	97	287	885	231	100	641	572	159	700	624
Arrive On Green	0.10	0.26	0.25	0.16	0.32	0.31	0.06	0.36	0.36	0.09	0.39	0.39
Sat Flow, veh/h	1781	3197	381	1781	2789	727	1781	1777	1585	1781	1777	1585
Grp Volume(v), veh/h	143	391	397	253	489	478	73	74	192	126	46	144
Grp Sat Flow(s),veh/h/ln	1781	1777	1802	1781	1777	1739	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	9.4	25.2	25.3	16.7	31.1	31.1	4.8	3.3	10.6	8.3	1.9	7.3
Cycle Q Clear(g_c), s	9.4	25.2	25.3	16.7	31.1	31.1	4.8	3.3	10.6	8.3	1.9	7.3
Prop In Lane	1.00		0.21	1.00		0.42	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	176	453	460	287	564	552	100	641	572	159	700	624
V/C Ratio(X)	0.81	0.86	0.86	0.88	0.87	0.87	0.73	0.12	0.34	0.79	0.07	0.23
Avail Cap(c_a), veh/h	193	533	541	327	666	652	157	641	572	208	700	624
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	0.94	0.94
Uniform Delay (d), s/veh	53.0	42.7	42.8	49.2	38.6	38.7	55.7	25.6	28.1	53.5	22.6	24.4
Incr Delay (d2), s/veh	20.9	12.1	12.1	21.4	10.3	10.5	9.5	0.4	1.6	13.4	0.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	12.2	12.4	8.9	14.6	14.3	2.4	1.4	4.2	4.2	0.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.9	54.8	54.9	70.6	48.8	49.1	65.2	25.9	29.7	66.9	22.8	25.2
LnGrp LOS	E	D	D	E	D	D	E	C	C	E	C	C
Approach Vol, veh/h		931			1220			339			316	
Approach Delay, s/veh		57.8			53.5			36.5			41.5	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	47.3	23.4	34.6	10.8	51.3	15.9	42.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	31.5	21.5	35.5	10.1	34.9	12.5	44.5
Max Q Clear Time (g_c+I1), s	10.3	12.6	18.7	27.3	6.8	9.3	11.4	33.1
Green Ext Time (p_c), s	0.1	1.3	0.2	2.8	0.0	1.0	0.0	4.4

Intersection Summary	
HCM 6th Ctrl Delay	51.5
HCM 6th LOS	D

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	180	791	998	660	1000	161
Future Volume (veh/h)	180	791	998	660	1000	161
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	189	833	1051	290	1053	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	241	2152	1480	650	994	456
Arrive On Green	0.14	0.61	0.42	0.41	0.29	0.29
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	189	833	1051	290	1053	70
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	7.7	9.0	18.3	9.9	21.5	2.5
Cycle Q Clear(g_c), s	7.7	9.0	18.3	9.9	21.5	2.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	241	2152	1480	650	994	456
V/C Ratio(X)	0.78	0.39	0.71	0.45	1.06	0.15
Avail Cap(c_a), veh/h	322	4301	3469	1537	994	456
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	7.6	18.1	15.9	26.6	19.9
Incr Delay (d2), s/veh	8.8	0.1	0.6	0.5	45.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	2.6	6.5	3.2	14.2	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	40.0	7.7	18.7	16.4	72.4	20.6
LnGrp LOS	D	A	B	B	F	C
Approach Vol, veh/h		1022	1341		1123	
Approach Delay, s/veh		13.7	18.2		69.2	
Approach LOS		B	B		E	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	49.3	25.5	14.1	35.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	90.0	21.0	13.0	72.5
Max Q Clear Time (g_c+I1), s	11.0	23.5	9.7	20.3
Green Ext Time (p_c), s	6.3	0.0	0.1	10.3

Intersection Summary	
HCM 6th Ctrl Delay	33.3
HCM 6th LOS	C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	535	1026	917	280	1560	651
Future Volume (veh/h)	535	1026	917	280	1560	651
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	546	1047	936	122	1592	452
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	440	2895	1036	468	1259	572
Arrive On Green	0.25	0.57	0.29	0.30	0.36	0.36
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598
Grp Volume(v), veh/h	546	1047	936	122	1592	452
Grp Sat Flow(s),veh/h/ln	1781	1702	1777	1585	1742	1598
Q Serve(g_s), s	35.0	15.8	35.9	8.3	51.2	35.9
Cycle Q Clear(g_c), s	35.0	15.8	35.9	8.3	51.2	35.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	440	2895	1036	468	1259	572
V/C Ratio(X)	1.24	0.36	0.90	0.26	1.26	0.79
Avail Cap(c_a), veh/h	440	3199	1247	562	1259	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.3	16.7	48.2	38.1	45.2	40.7
Incr Delay (d2), s/veh	126.1	0.0	7.5	0.1	125.3	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.6	5.9	16.5	3.2	43.2	14.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	179.4	16.7	55.7	38.2	170.5	47.5
LnGrp LOS	F	B	E	D	F	D
Approach Vol, veh/h		1593	1058		2044	
Approach Delay, s/veh		72.5	53.7		143.3	
Approach LOS		E	D		F	

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		85.6			39.0	46.6		56.0
Change Period (Y+Rc), s		5.3			4.5	5.3		5.3
Max Green Setting (Gmax), s		88.7			34.5	49.7		50.7
Max Q Clear Time (g_c+I1), s		17.8			37.0	37.9		53.2
Green Ext Time (p_c), s		5.0			0.0	3.4		0.0

Intersection Summary		
HCM 6th Ctrl Delay		99.1
HCM 6th LOS		F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	785	1801	0	0	514	1120	683	10	410	0	0	0
Future Volume (veh/h)	785	1801	0	0	514	1120	683	10	410	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	826	1896	0	0	541	795	727	0	397			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	896	3206	0	0	626	1061	1008	0	448			
Arrive On Green	0.26	0.62	0.00	0.00	0.33	0.33	0.29	0.00	0.29			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	826	1896	0	0	541	795	727	0	397			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	24.1	22.9	0.0	0.0	28.0	23.1	19.3	0.0	25.2			
Cycle Q Clear(g_c), s	24.1	22.9	0.0	0.0	28.0	23.1	19.3	0.0	25.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	896	3206	0	0	626	1061	1008	0	448			
V/C Ratio(X)	0.92	0.59	0.00	0.00	0.86	0.75	0.72	0.00	0.89			
Avail Cap(c_a), veh/h	918	4682	0	0	1155	1957	1542	0	686			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	37.7	11.7	0.0	0.0	32.6	31.0	33.6	0.0	35.7			
Incr Delay (d2), s/veh	13.9	0.1	0.0	0.0	1.4	0.4	0.4	0.0	6.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.4	7.4	0.0	0.0	12.2	8.4	7.9	0.0	0.8			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.6	11.8	0.0	0.0	34.1	31.4	33.9	0.0	41.9			
LnGrp LOS	D	B	A	A	C	C	C	A	D			
Approach Vol, veh/h		2722			1336			1124				
Approach Delay, s/veh		23.9			32.5			36.7				
Approach LOS		C			C			D				
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		69.8		34.5	30.3	39.4						
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3						
Max Green Setting (Gmax), s		94.4		45.0	27.0	63.4						
Max Q Clear Time (g_c+I1), s		24.9		27.2	26.1	30.0						
Green Ext Time (p_c), s		13.0		2.1	0.2	4.1						
Intersection Summary												
HCM 6th Ctrl Delay			28.9									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	0.6					
Movement	**EBL**	**EBR**	**NBL**	**NBT**	**SBT**	**SBR**
Lane Configurations						
Traffic Vol, veh/h	27	0	0	220	200	36
Future Vol, veh/h	27	0	0	220	200	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	0	0	232	211	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	346	125	249	0	-	0
Stage 1	230	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	625	902	1314	-	-	-
Stage 1	786	-	-	-	-	-
Stage 2	896	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	625	902	1314	-	-	-
Mov Cap-2 Maneuver	625	-	-	-	-	-
Stage 1	786	-	-	-	-	-
Stage 2	896	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1314	-	625	-	-
HCM Lane V/C Ratio	-	-	0.045	-	-
HCM Control Delay (s)	0	-	11	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	40	200	13	30	10	20	444	14	20	488	163
Future Volume (veh/h)	195	40	200	13	30	10	20	444	14	20	488	163
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	207	43	213	14	32	11	21	472	15	21	519	173
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	254	466	395	55	183	63	70	948	423	70	948	423
Arrive On Green	0.14	0.25	0.25	0.03	0.14	0.12	0.04	0.27	0.27	0.04	0.27	0.27
Sat Flow, veh/h	1781	1870	1585	1781	1331	457	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	207	43	213	14	0	43	21	472	15	21	519	173
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1788	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.4	0.7	4.5	0.3	0.0	0.8	0.4	4.3	0.3	0.4	4.8	3.5
Cycle Q Clear(g_c), s	4.4	0.7	4.5	0.3	0.0	0.8	0.4	4.3	0.3	0.4	4.8	3.5
Prop In Lane	1.00		1.00	1.00		0.26	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	254	466	395	55	0	246	70	948	423	70	948	423
V/C Ratio(X)	0.82	0.09	0.54	0.25	0.00	0.17	0.30	0.50	0.04	0.30	0.55	0.41
Avail Cap(c_a), veh/h	254	895	759	254	0	856	254	1793	800	254	1793	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	11.1	12.6	18.3	0.0	14.8	18.1	12.0	10.5	18.1	12.2	11.7
Incr Delay (d2), s/veh	18.4	0.1	1.1	2.4	0.0	0.3	2.4	0.4	0.0	2.4	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.2	1.4	0.1	0.0	0.3	0.2	1.2	0.1	0.2	1.4	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	11.2	13.7	20.7	0.0	15.1	20.5	12.4	10.5	20.5	12.7	12.3
LnGrp LOS	C	B	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h		463			57			508			713	
Approach Delay, s/veh		22.8			16.5			12.7			12.8	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.5	14.3	5.2	13.6	5.5	14.3	9.5	9.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.4	6.3	2.3	6.5	2.4	6.8	6.4	2.8
Green Ext Time (p_c), s	0.0	2.3	0.0	0.7	0.0	3.0	0.0	0.1

Intersection Summary		
HCM 6th Ctrl Delay		15.5
HCM 6th LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	150	85	29	120	100	185	638	160	310	597	110
Future Volume (veh/h)	100	150	85	29	120	100	185	638	160	310	597	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	108	161	79	31	129	90	199	686	153	333	642	105
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	139	275	135	47	185	129	244	906	202	377	1188	194
Arrive On Green	0.08	0.23	0.23	0.03	0.18	0.18	0.13	0.31	0.29	0.21	0.38	0.36
Sat Flow, veh/h	1810	1199	588	1810	1036	723	1810	2927	652	1810	3102	507
Grp Volume(v), veh/h	108	0	240	31	0	219	199	423	416	333	373	374
Grp Sat Flow(s),veh/h/ln	1810	0	1787	1810	0	1758	1810	1805	1775	1810	1805	1804
Q Serve(g_s), s	4.1	0.0	8.4	1.2	0.0	8.3	7.5	14.9	15.0	12.6	11.4	11.4
Cycle Q Clear(g_c), s	4.1	0.0	8.4	1.2	0.0	8.3	7.5	14.9	15.0	12.6	11.4	11.4
Prop In Lane	1.00		0.33	1.00		0.41	1.00		0.37	1.00		0.28
Lane Grp Cap(c), veh/h	139	0	410	47	0	314	244	559	549	377	691	691
V/C Ratio(X)	0.77	0.00	0.58	0.66	0.00	0.70	0.82	0.76	0.76	0.88	0.54	0.54
Avail Cap(c_a), veh/h	282	0	936	256	0	896	487	1022	1005	436	971	971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.0	0.0	24.2	34.1	0.0	27.2	29.7	22.0	22.2	27.1	16.9	17.1
Incr Delay (d2), s/veh	3.4	0.0	0.5	5.9	0.0	1.1	2.5	0.8	0.8	15.7	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	3.2	0.6	0.0	3.2	3.2	5.6	5.6	6.5	4.1	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.4	0.0	24.7	40.0	0.0	28.3	32.2	22.8	23.0	42.8	17.2	17.4
LnGrp LOS	D	A	C	D	A	C	C	C	C	D	B	B
Approach Vol, veh/h		348			250			1038			1080	
Approach Delay, s/veh		28.0			29.7			24.7			25.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.7	25.9	5.8	20.2	13.5	31.0	9.4	16.6
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0
Max Green Setting (Gmax), s	17.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0
Max Q Clear Time (g_c+I1), s	14.6	17.0	3.2	10.4	9.5	13.4	6.1	10.3
Green Ext Time (p_c), s	0.1	3.0	0.0	0.8	0.2	2.6	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	25.8
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	863	429	286	883	265	348	477	283	373	402	40
Future Volume (veh/h)	100	863	429	286	883	265	348	477	283	373	402	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	109	938	189	311	960	97	378	518	248	405	437	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	1197	240	339	1871	189	422	627	299	461	936	77
Arrive On Green	0.07	0.28	0.27	0.19	0.39	0.38	0.12	0.27	0.26	0.13	0.28	0.27
Sat Flow, veh/h	1810	4307	864	1810	4789	483	3510	2357	1124	3510	3376	277
Grp Volume(v), veh/h	109	752	375	311	693	364	378	396	370	405	233	240
Grp Sat Flow(s),veh/h/ln	1810	1729	1714	1810	1729	1813	1755	1805	1676	1755	1805	1848
Q Serve(g_s), s	6.9	23.4	23.6	19.6	17.8	17.9	12.4	24.0	24.2	13.2	12.5	12.6
Cycle Q Clear(g_c), s	6.9	23.4	23.6	19.6	17.8	17.9	12.4	24.0	24.2	13.2	12.5	12.6
Prop In Lane	1.00		0.50	1.00		0.27	1.00		0.67	1.00		0.15
Lane Grp Cap(c), veh/h	135	961	476	339	1351	708	422	481	446	461	500	512
V/C Ratio(X)	0.81	0.78	0.79	0.92	0.51	0.51	0.90	0.82	0.83	0.88	0.47	0.47
Avail Cap(c_a), veh/h	171	1248	618	389	1664	872	422	636	590	483	667	683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	38.8	39.2	46.4	27.0	27.2	50.5	40.1	40.6	49.7	34.9	35.0
Incr Delay (d2), s/veh	15.9	1.8	3.7	23.1	0.1	0.2	20.5	5.1	5.7	15.6	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	9.8	10.0	10.7	7.0	7.5	6.5	10.9	10.4	6.6	5.3	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.0	40.6	42.9	69.5	27.1	27.4	71.0	45.2	46.3	65.2	35.2	35.3
LnGrp LOS	E	D	D	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		1236			1368			1144			878	
Approach Delay, s/veh		43.8			36.8			54.1			49.1	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.3	35.0	25.8	36.3	18.0	36.3	12.7	49.5
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7
Max Q Clear Time (g_c+I1), s	15.2	26.2	21.6	25.6	14.4	14.6	8.9	19.9
Green Ext Time (p_c), s	0.1	2.4	0.2	4.2	0.0	1.5	0.0	4.5

Intersection Summary		
HCM 6th Ctrl Delay		45.3
HCM 6th LOS		D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	320	952	126	107	1224	310	298	497	263	480	223	321
Future Volume (veh/h)	320	952	126	107	1224	310	298	497	263	480	223	321
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	337	1002	133	113	1288	326	314	523	277	505	235	338
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	218	1654	219	149	1659	513	237	630	333	392	926	406
Arrive On Green	0.12	0.36	0.36	0.08	0.32	0.32	0.13	0.28	0.27	0.11	0.26	0.26
Sat Flow, veh/h	1781	4552	603	1781	5106	1578	1795	2264	1196	3483	3582	1569
Grp Volume(v), veh/h	337	749	386	113	1288	326	314	413	387	505	235	338
Grp Sat Flow(s),veh/h/ln	1781	1702	1751	1781	1702	1578	1795	1791	1668	1742	1791	1569
Q Serve(g_s), s	12.5	18.4	18.4	6.3	23.3	18.0	13.5	22.2	22.3	11.5	5.3	20.8
Cycle Q Clear(g_c), s	12.5	18.4	18.4	6.3	23.3	18.0	13.5	22.2	22.3	11.5	5.3	20.8
Prop In Lane	1.00		0.34	1.00		1.00	1.00		0.72	1.00		1.00
Lane Grp Cap(c), veh/h	218	1237	636	149	1659	513	237	498	464	392	926	406
V/C Ratio(X)	1.55	0.61	0.61	0.76	0.78	0.64	1.32	0.83	0.83	1.29	0.25	0.83
Avail Cap(c_a), veh/h	218	1438	740	270	2307	713	237	757	705	392	1443	632
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	26.6	26.6	45.8	31.2	29.4	44.4	34.6	34.9	45.4	30.1	35.8
Incr Delay (d2), s/veh	268.0	0.3	0.5	2.9	0.7	0.5	172.4	2.8	3.1	148.2	0.1	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.5	7.0	7.3	2.8	9.1	6.5	17.1	9.5	9.0	12.8	2.2	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	312.9	26.8	27.1	48.8	31.9	29.9	216.8	37.5	38.0	193.6	30.1	38.9
LnGrp LOS	F	C	C	D	C	C	F	D	D	F	C	D
Approach Vol, veh/h		1472			1727			1114			1078	
Approach Delay, s/veh		92.4			32.6			88.2			109.4	
Approach LOS		F			C			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	33.2	12.1	42.0	17.0	31.2	16.0	38.0
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	11.0	42.7	15.0	42.7	13.0	40.7	12.0	45.7
Max Q Clear Time (g_c+I1), s	13.5	24.3	8.3	20.4	15.5	22.8	14.5	25.3
Green Ext Time (p_c), s	0.0	2.8	0.1	4.7	0.0	1.4	0.0	6.5

Intersection Summary	
HCM 6th Ctrl Delay	75.8
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1455	310	820	1561	20	110	10	251	20	10	20
Future Volume (veh/h)	10	1455	310	820	1561	20	110	10	251	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	1532	326	863	1643	21	116	0	271	21	11	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	23	1807	383	964	3607	46	175	0	353	38	48	92
Arrive On Green	0.01	0.43	0.43	0.28	0.69	0.69	0.05	0.00	0.11	0.02	0.08	0.08
Sat Flow, veh/h	1781	4220	893	3456	5196	66	3563	0	3170	1781	575	1098
Grp Volume(v), veh/h	11	1234	624	863	1076	588	116	0	271	21	0	32
Grp Sat Flow(s),veh/h/ln	1781	1702	1710	1728	1702	1858	1781	0	1585	1781	0	1673
Q Serve(g_s), s	0.7	35.6	35.9	26.2	15.5	15.5	3.5	0.0	9.1	1.3	0.0	2.0
Cycle Q Clear(g_c), s	0.7	35.6	35.9	26.2	15.5	15.5	3.5	0.0	9.1	1.3	0.0	2.0
Prop In Lane	1.00		0.52	1.00		0.04	1.00		1.00	1.00		0.66
Lane Grp Cap(c), veh/h	23	1458	732	964	2363	1290	175	0	353	38	0	140
V/C Ratio(X)	0.48	0.85	0.85	0.90	0.46	0.46	0.66	0.00	0.77	0.55	0.00	0.23
Avail Cap(c_a), veh/h	90	1572	789	1153	2537	1385	212	0	1160	90	0	597
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.6	28.0	28.1	37.9	7.5	7.5	51.1	0.0	47.2	53.0	0.0	46.8
Incr Delay (d2), s/veh	14.4	4.3	8.4	8.2	0.1	0.3	5.7	0.0	3.5	11.6	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	14.2	15.3	11.6	4.5	5.0	1.7	0.0	3.6	0.7	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.0	32.3	36.6	46.1	7.6	7.7	56.8	0.0	50.8	64.5	0.0	47.6
LnGrp LOS	E	C	D	D	A	A	E	A	D	E	A	D
Approach Vol, veh/h		1869			2527			387			53	
Approach Delay, s/veh		33.9			20.8			52.6			54.3	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	16.2	35.0	51.3	9.9	13.2	5.9	80.4
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	5.5	40.0	36.5	50.5	6.5	39.0	5.5	81.5
Max Q Clear Time (g_c+I1), s	3.3	11.1	28.2	37.9	5.5	4.0	2.7	17.5
Green Ext Time (p_c), s	0.0	1.1	2.3	8.9	0.0	0.1	0.0	16.6

Intersection Summary	
HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	160	40	101	120	462	20	468	75	564	713	30
Future Volume (veh/h)	90	160	40	101	120	462	20	468	75	564	713	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	95	168	42	106	126	201	21	493	79	594	751	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	137	497	121	154	327	291	51	690	110	777	1458	62
Arrive On Green	0.08	0.17	0.16	0.09	0.18	0.18	0.03	0.22	0.21	0.22	0.42	0.41
Sat Flow, veh/h	1810	2877	701	1795	1791	1595	1810	3112	496	3483	3500	149
Grp Volume(v), veh/h	95	104	106	106	126	201	21	285	287	594	384	399
Grp Sat Flow(s),veh/h/ln	1810	1805	1772	1795	1791	1595	1810	1805	1803	1742	1791	1858
Q Serve(g_s), s	3.0	2.9	3.1	3.3	3.6	6.9	0.7	8.5	8.6	9.3	9.3	9.3
Cycle Q Clear(g_c), s	3.0	2.9	3.1	3.3	3.6	6.9	0.7	8.5	8.6	9.3	9.3	9.3
Prop In Lane	1.00		0.40	1.00		1.00	1.00		0.28	1.00		0.08
Lane Grp Cap(c), veh/h	137	312	306	154	327	291	51	400	400	777	746	774
V/C Ratio(X)	0.69	0.33	0.35	0.69	0.39	0.69	0.41	0.71	0.72	0.76	0.52	0.52
Avail Cap(c_a), veh/h	171	789	775	477	1090	971	140	935	934	3732	2708	2810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.3	21.2	21.3	25.9	21.0	22.3	27.9	21.0	21.1	21.2	12.6	12.7
Incr Delay (d2), s/veh	8.5	0.2	0.3	5.4	0.3	1.1	1.9	0.9	0.9	0.6	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.1	1.1	1.5	1.3	2.3	0.3	3.2	3.2	3.5	3.3	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	21.4	21.6	31.3	21.2	23.4	29.8	21.9	22.0	21.8	12.8	12.9
LnGrp LOS	C	C	C	C	C	C	C	C	C	C	B	B
Approach Vol, veh/h		305			433			593			1377	
Approach Delay, s/veh		25.6			24.7			22.2			16.7	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.5	17.7	10.5	13.6	5.2	29.1	9.9	14.2
Change Period (Y+Rc), s	4.0	5.3	6.0	4.0	4.0	5.3	6.0	4.0
Max Green Setting (Gmax), s	62.0	29.7	15.0	25.0	4.0	87.7	5.0	35.0
Max Q Clear Time (g_c+I1), s	11.3	10.6	5.3	5.1	2.7	11.3	5.0	8.9
Green Ext Time (p_c), s	1.2	1.8	0.1	0.6	0.0	3.5	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	691	26	102	911	130	68	205	269	120	43	144
Future Volume (veh/h)	102	691	26	102	911	130	68	205	269	120	43	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	107	727	24	107	959	126	72	216	86	126	45	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	139	1198	40	139	1077	141	99	897	346	159	696	621
Arrive On Green	0.08	0.34	0.34	0.08	0.34	0.34	0.06	0.36	0.35	0.09	0.39	0.39
Sat Flow, veh/h	1781	3510	116	1781	3158	415	1781	2507	967	1781	1777	1585
Grp Volume(v), veh/h	107	368	383	107	539	546	72	151	151	126	45	48
Grp Sat Flow(s),veh/h/ln	1781	1777	1850	1781	1777	1796	1781	1777	1696	1781	1777	1585
Q Serve(g_s), s	7.1	20.6	20.7	7.1	34.5	34.5	4.8	7.2	7.5	8.3	1.9	2.3
Cycle Q Clear(g_c), s	7.1	20.6	20.7	7.1	34.5	34.5	4.8	7.2	7.5	8.3	1.9	2.3
Prop In Lane	1.00		0.06	1.00		0.23	1.00		0.57	1.00		1.00
Lane Grp Cap(c), veh/h	139	606	631	139	606	612	99	636	607	159	696	621
V/C Ratio(X)	0.77	0.61	0.61	0.77	0.89	0.89	0.73	0.24	0.25	0.79	0.06	0.08
Avail Cap(c_a), veh/h	193	699	727	160	666	673	137	636	607	208	696	621
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	54.2	32.8	32.8	54.3	37.4	37.5	55.8	27.0	27.2	53.5	22.8	23.0
Incr Delay (d2), s/veh	11.7	1.2	1.1	17.9	13.3	13.3	11.4	0.9	1.0	13.9	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	8.7	9.1	3.8	16.5	16.7	2.4	3.1	3.1	4.2	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.9	34.0	34.0	72.2	50.7	50.8	67.2	27.9	28.2	67.4	22.9	23.3
LnGrp LOS	E	C	C	E	D	D	E	C	C	E	C	C
Approach Vol, veh/h		858			1192			374			219	
Approach Delay, s/veh		38.0			52.7			35.6			48.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	47.0	13.3	45.0	10.7	51.0	13.4	44.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	31.5	10.3	46.7	8.7	36.3	12.5	44.5
Max Q Clear Time (g_c+I1), s	10.3	9.5	9.1	22.7	6.8	4.3	9.1	36.5
Green Ext Time (p_c), s	0.1	1.5	0.0	4.3	0.0	0.4	0.1	3.9

Intersection Summary	
HCM 6th Ctrl Delay	45.1
HCM 6th LOS	D

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	91	989	1083	880	310	60
Future Volume (veh/h)	91	989	1083	880	310	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	96	1041	1140	461	326	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	136	2080	1605	705	1038	476
Arrive On Green	0.08	0.59	0.45	0.44	0.30	0.30
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	96	1041	1140	461	326	15
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	3.7	12.0	18.1	15.9	5.1	0.5
Cycle Q Clear(g_c), s	3.7	12.0	18.1	15.9	5.1	0.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	136	2080	1605	705	1038	476
V/C Ratio(X)	0.71	0.50	0.71	0.65	0.31	0.03
Avail Cap(c_a), veh/h	229	3100	2439	1077	1038	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.5	8.5	15.5	15.2	18.9	17.3
Incr Delay (d2), s/veh	6.5	0.2	0.6	1.0	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	3.4	6.1	4.9	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.1	8.7	16.1	16.2	19.7	17.4
LnGrp LOS	D	A	B	B	B	B
Approach Vol, veh/h		1137	1601		341	
Approach Delay, s/veh		11.2	16.1		19.6	
Approach LOS		B	B		B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	44.9	25.0	9.3	35.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	60.5	20.5	8.5	47.5
Max Q Clear Time (g_c+I1), s	14.0	7.1	5.7	20.1
Green Ext Time (p_c), s	8.5	0.9	0.0	11.0

Intersection Summary	
HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	378	1061	1851	570	960	192
Future Volume (veh/h)	378	1061	1851	570	960	192
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	398	1117	1948	397	1011	67
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	297	3561	1768	795	760	342
Arrive On Green	0.17	0.70	0.50	0.50	0.22	0.21
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598
Grp Volume(v), veh/h	398	1117	1948	397	1011	67
Grp Sat Flow(s),veh/h/ln	1781	1702	1777	1585	1742	1598
Q Serve(g_s), s	20.0	10.2	59.7	20.0	26.2	4.1
Cycle Q Clear(g_c), s	20.0	10.2	59.7	20.0	26.2	4.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	297	3561	1768	795	760	342
V/C Ratio(X)	1.34	0.31	1.10	0.50	1.33	0.20
Avail Cap(c_a), veh/h	297	3561	1768	795	760	342
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.0	7.0	30.1	19.9	46.9	38.7
Incr Delay (d2), s/veh	174.3	0.0	55.0	0.2	157.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	28.0	3.1	36.7	6.9	27.5	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	224.3	7.0	85.2	20.1	204.1	38.8
LnGrp LOS	F	A	F	C	F	D
Approach Vol, veh/h		1515	2345		1078	
Approach Delay, s/veh		64.1	74.1		193.9	
Approach LOS		E	E		F	

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		89.0			24.0	65.0		31.0
Change Period (Y+Rc), s		5.3			4.5	5.3		5.3
Max Green Setting (Gmax), s		83.7			19.5	59.7		25.7
Max Q Clear Time (g_c+I1), s		12.2			22.0	61.7		28.2
Green Ext Time (p_c), s		5.5			0.0	0.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		97.2
HCM 6th LOS		F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	518	1503	0	0	1855	1170	566	10	220	0	0	0
Future Volume (veh/h)	518	1503	0	0	1855	1170	566	10	220	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	545	1582	0	0	1953	770	604	0	114			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	675	3370	0	0	1557	660	756	0	337			
Arrive On Green	0.19	0.65	0.00	0.00	0.41	0.41	0.21	0.00	0.21			
Sat Flow, veh/h	3483	5316	0	0	3770	1598	3534	0	1572			
Grp Volume(v), veh/h	545	1582	0	0	1953	770	604	0	114			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	10.9	11.2	0.0	0.0	30.2	30.2	11.8	0.0	4.5			
Cycle Q Clear(g_c), s	10.9	11.2	0.0	0.0	30.2	30.2	11.8	0.0	4.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	675	3370	0	0	1557	660	756	0	337			
V/C Ratio(X)	0.81	0.47	0.00	0.00	1.25	1.17	0.80	0.00	0.34			
Avail Cap(c_a), veh/h	1024	3885	0	0	1557	660	2668	0	1187			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	28.2	6.3	0.0	0.0	21.5	21.5	27.2	0.0	24.4			
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.0	119.9	90.9	0.8	0.0	0.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.3	2.6	0.0	0.0	37.0	26.1	4.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	6.3	0.0	0.0	141.3	112.4	28.0	0.0	24.6			
LnGrp LOS	C	A	A	A	F	F	C	A	C			
Approach Vol, veh/h		2127			2723			718				
Approach Delay, s/veh		12.3			133.1			27.5				
Approach LOS		B			F			C				

Timer - Assigned Phs		2		4	5	6			
Phs Duration (G+Y+Rc), s		52.7		20.4	17.7	35.0			
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3			
Max Green Setting (Gmax), s		54.7		54.7	21.0	29.7			
Max Q Clear Time (g_c+I1), s		13.2		13.8	12.9	32.2			
Green Ext Time (p_c), s		9.0		1.3	0.7	0.0			

Intersection Summary	
HCM 6th Ctrl Delay	73.4
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	4.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	200	0	0	230	70	63
Future Vol, veh/h	200	0	0	230	70	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	211	0	0	242	74	66

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	228	70	140	0	-	0
Stage 1	107	-	-	-	-	-
Stage 2	121	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	740	978	1441	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	740	978	1441	-	-	-
Mov Cap-2 Maneuver	740	-	-	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	891	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1441	-	740	-	-
HCM Lane V/C Ratio	-	-	0.284	-	-
HCM Control Delay (s)	0	-	11.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	1.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	60	60	20	50	20	30	461	20	20	308	161
Future Volume (veh/h)	273	60	60	20	50	20	30	461	20	20	308	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	297	65	65	22	54	22	33	501	22	22	335	175
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	260	448	380	72	169	69	93	902	402	72	861	384
Arrive On Green	0.15	0.24	0.24	0.04	0.13	0.12	0.05	0.25	0.25	0.04	0.24	0.24
Sat Flow, veh/h	1781	1870	1585	1781	1263	515	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	297	65	65	22	0	76	33	501	22	22	335	175
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1778	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.5	1.0	1.2	0.5	0.0	1.5	0.7	4.6	0.4	0.5	3.0	3.5
Cycle Q Clear(g_c), s	5.5	1.0	1.2	0.5	0.0	1.5	0.7	4.6	0.4	0.5	3.0	3.5
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	260	448	380	72	0	238	93	902	402	72	861	384
V/C Ratio(X)	1.14	0.15	0.17	0.30	0.00	0.32	0.36	0.56	0.05	0.30	0.39	0.46
Avail Cap(c_a), veh/h	260	920	780	260	0	874	260	1842	822	260	1842	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	11.3	11.3	17.5	0.0	14.8	17.2	12.2	10.6	17.5	11.9	12.1
Incr Delay (d2), s/veh	99.0	0.1	0.2	2.3	0.0	0.8	2.3	0.5	0.1	2.3	0.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	0.4	0.4	0.2	0.0	0.5	0.3	1.3	0.1	0.2	0.8	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	115.0	11.4	11.6	19.9	0.0	15.6	19.5	12.7	10.7	19.9	12.2	13.0
LnGrp LOS	F	B	B	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h		427			98			556			532	
Approach Delay, s/veh		83.5			16.5			13.0			12.8	
Approach LOS		F			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.5	13.5	5.5	13.0	6.0	13.1	9.5	9.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+I1), s	2.5	6.6	2.5	3.2	2.7	5.5	7.5	3.5				
Green Ext Time (p_c), s	0.0	2.4	0.0	0.4	0.0	2.1	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			31.8									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	210	212	186	210	160	148	839	186	150	1209	140
Future Volume (veh/h)	140	210	212	186	210	160	148	839	186	150	1209	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	152	228	212	202	228	142	161	912	176	163	1314	134
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	173	247	230	173	299	186	139	1155	223	173	1330	135
Arrive On Green	0.10	0.27	0.27	0.10	0.27	0.27	0.08	0.38	0.37	0.10	0.40	0.39
Sat Flow, veh/h	1810	906	842	1810	1095	682	1810	3018	582	1810	3309	336
Grp Volume(v), veh/h	152	0	440	202	0	370	161	545	543	163	714	734
Grp Sat Flow(s),veh/h/ln	1810	0	1748	1810	0	1777	1810	1805	1795	1810	1805	1840
Q Serve(g_s), s	8.7	0.0	25.6	10.0	0.0	20.0	8.0	27.9	28.0	9.4	40.9	41.5
Cycle Q Clear(g_c), s	8.7	0.0	25.6	10.0	0.0	20.0	8.0	27.9	28.0	9.4	40.9	41.5
Prop In Lane	1.00		0.48	1.00		0.38	1.00		0.32	1.00		0.18
Lane Grp Cap(c), veh/h	173	0	477	173	0	485	139	691	687	173	725	739
V/C Ratio(X)	0.88	0.00	0.92	1.17	0.00	0.76	1.16	0.79	0.79	0.94	0.98	0.99
Avail Cap(c_a), veh/h	173	0	569	173	0	578	139	691	687	173	725	739
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.6	0.0	36.9	47.2	0.0	34.9	48.2	28.5	28.7	47.0	30.9	31.2
Incr Delay (d2), s/veh	35.3	0.0	17.5	120.3	0.0	3.9	126.6	5.6	5.7	50.8	29.4	31.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	12.6	10.1	0.0	8.7	8.4	12.3	12.3	6.5	22.2	23.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.9	0.0	54.4	167.5	0.0	38.8	174.9	34.2	34.4	97.8	60.4	62.2
LnGrp LOS	F	A	D	F	A	D	F	C	C	F	E	E
Approach Vol, veh/h		592			572			1249			1611	
Approach Delay, s/veh		61.5			84.3			52.4			65.0	
Approach LOS		E			F			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	44.0	14.0	32.5	12.0	46.0	14.0	32.5
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0
Max Green Setting (Gmax), s	10.0	38.7	10.0	34.0	8.0	40.7	10.0	34.0
Max Q Clear Time (g_c+I1), s	11.4	30.0	12.0	27.6	10.0	43.5	10.7	22.0
Green Ext Time (p_c), s	0.0	2.9	0.0	0.9	0.0	0.0	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	63.3
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	761	323	305	970	310	479	422	153	390	607	30
Future Volume (veh/h)	40	761	323	305	970	310	479	422	153	390	607	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	43	827	98	332	1054	129	521	459	143	424	660	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	56	1212	143	359	1997	244	553	733	226	484	884	40
Arrive On Green	0.03	0.26	0.25	0.20	0.43	0.42	0.16	0.27	0.26	0.14	0.25	0.24
Sat Flow, veh/h	1810	4670	549	1810	4675	571	3510	2698	833	3510	3511	159
Grp Volume(v), veh/h	43	611	314	332	779	404	521	306	296	424	339	351
Grp Sat Flow(s),veh/h/ln	1810	1729	1762	1810	1729	1788	1755	1805	1726	1755	1805	1865
Q Serve(g_s), s	2.8	19.1	19.4	21.7	20.1	20.2	17.7	17.9	18.3	14.3	20.9	20.9
Cycle Q Clear(g_c), s	2.8	19.1	19.4	21.7	20.1	20.2	17.7	17.9	18.3	14.3	20.9	20.9
Prop In Lane	1.00		0.31	1.00		0.32	1.00		0.48	1.00		0.09
Lane Grp Cap(c), veh/h	56	898	457	359	1477	764	553	490	469	484	455	470
V/C Ratio(X)	0.77	0.68	0.69	0.93	0.53	0.53	0.94	0.62	0.63	0.88	0.75	0.75
Avail Cap(c_a), veh/h	90	1090	555	405	1692	875	553	584	558	582	599	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.0	40.1	40.4	47.5	25.5	25.7	50.2	38.5	38.9	51.0	41.5	41.6
Incr Delay (d2), s/veh	8.3	0.8	1.7	24.2	0.1	0.2	24.4	0.7	0.9	11.0	2.3	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	8.0	8.4	11.9	7.9	8.2	9.4	7.8	7.6	6.8	9.3	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.3	40.9	42.1	71.7	25.6	25.9	74.6	39.2	39.8	62.0	43.8	43.9
LnGrp LOS	E	D	D	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		968			1515			1123			1114	
Approach Delay, s/veh		42.5			35.8			55.8			50.7	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.6	36.8	27.9	35.3	23.0	34.4	7.7	55.5
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7
Max Q Clear Time (g_c+I1), s	16.3	20.3	23.7	21.4	19.7	22.9	4.8	22.2
Green Ext Time (p_c), s	0.3	2.0	0.2	3.3	0.0	2.1	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	335	1415	191	232	1213	320	282	427	337	510	340	144
Future Volume (veh/h)	335	1415	191	232	1213	320	282	427	337	510	340	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	342	1444	183	237	1238	131	288	436	236	520	347	30
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	287	1622	205	245	1688	522	297	522	280	493	746	326
Arrive On Green	0.16	0.35	0.35	0.14	0.33	0.33	0.17	0.23	0.23	0.14	0.21	0.21
Sat Flow, veh/h	1781	4579	580	1781	5106	1578	1795	2250	1207	3483	3582	1567
Grp Volume(v), veh/h	342	1073	554	237	1238	131	288	346	326	520	347	30
Grp Sat Flow(s),veh/h/ln	1781	1702	1755	1781	1702	1578	1795	1791	1666	1742	1791	1567
Q Serve(g_s), s	20.5	37.8	37.8	16.8	27.2	7.7	20.3	23.4	23.7	18.0	10.8	2.0
Cycle Q Clear(g_c), s	20.5	37.8	37.8	16.8	27.2	7.7	20.3	23.4	23.7	18.0	10.8	2.0
Prop In Lane	1.00		0.33	1.00		1.00	1.00		0.72	1.00		1.00
Lane Grp Cap(c), veh/h	287	1206	622	245	1688	522	297	415	386	493	746	326
V/C Ratio(X)	1.19	0.89	0.89	0.97	0.73	0.25	0.97	0.83	0.84	1.05	0.47	0.09
Avail Cap(c_a), veh/h	287	1318	680	245	1857	574	297	609	566	493	1133	496
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.3	38.7	38.7	54.5	37.6	31.0	52.7	46.5	46.8	54.5	44.1	40.6
Incr Delay (d2), s/veh	114.7	7.0	12.4	47.6	1.1	0.1	44.1	4.3	5.1	55.4	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.1	16.2	17.7	10.6	11.1	2.9	12.5	10.6	10.1	11.5	4.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	168.0	45.7	51.1	102.0	38.7	31.1	96.8	50.7	51.9	110.0	44.3	40.7
LnGrp LOS	F	D	D	F	D	C	F	D	D	F	D	D
Approach Vol, veh/h		1969			1606			960			897	
Approach Delay, s/veh		68.5			47.4			64.9			82.2	
Approach LOS		E			D			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	34.3	21.0	49.8	25.0	31.3	24.0	46.8
Change Period (Y+Rc), s	4.5	5.3	4.0	5.3	4.5	5.3	4.0	5.3
Max Green Setting (Gmax), s	17.5	42.7	17.0	48.7	20.5	39.7	20.0	45.7
Max Q Clear Time (g_c+I1), s	20.0	25.7	18.8	39.8	22.3	12.8	22.5	29.2
Green Ext Time (p_c), s	0.0	2.2	0.0	4.7	0.0	1.3	0.0	5.4

Intersection Summary	
HCM 6th Ctrl Delay	63.9
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	2162	170	401	1405	20	330	10	820	30	10	20
Future Volume (veh/h)	30	2162	170	401	1405	20	330	10	820	30	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	2276	173	422	1479	20	347	0	538	32	11	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	51	2481	186	482	3234	44	382	0	496	51	120	22
Arrive On Green	0.03	0.51	0.51	0.14	0.62	0.62	0.11	0.00	0.16	0.03	0.08	0.08
Sat Flow, veh/h	1781	4845	364	3456	5192	70	3563	0	3170	1781	1540	280
Grp Volume(v), veh/h	32	1591	858	422	970	529	347	0	538	32	0	13
Grp Sat Flow(s),veh/h/ln	1781	1702	1805	1728	1702	1858	1781	0	1585	1781	0	1820
Q Serve(g_s), s	1.9	45.9	47.4	12.8	16.1	16.1	10.3	0.0	12.4	1.9	0.0	0.7
Cycle Q Clear(g_c), s	1.9	45.9	47.4	12.8	16.1	16.1	10.3	0.0	12.4	1.9	0.0	0.7
Prop In Lane	1.00		0.20	1.00		0.04	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	51	1743	924	482	2121	1157	382	0	496	51	0	142
V/C Ratio(X)	0.63	0.91	0.93	0.88	0.46	0.46	0.91	0.00	1.08	0.63	0.00	0.09
Avail Cap(c_a), veh/h	158	1761	934	499	2121	1157	382	0	1360	91	0	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.5	24.0	24.3	45.2	10.7	10.7	47.4	0.0	24.8	51.5	0.0	45.9
Incr Delay (d2), s/veh	12.0	7.7	15.0	15.6	0.2	0.3	24.9	0.0	46.0	12.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	18.3	21.8	6.3	5.2	5.8	5.9	0.0	7.6	1.0	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.5	31.7	39.3	60.8	10.8	10.9	72.3	0.0	70.8	63.5	0.0	46.2
LnGrp LOS	E	C	D	E	B	B	E	A	F	E	A	D
Approach Vol, veh/h		2481			1921			885			45	
Approach Delay, s/veh		34.7			21.8			71.4			58.5	
Approach LOS		C			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	20.8	19.5	59.4	16.0	12.4	7.6	71.3
Change Period (Y+Rc), s	4.5	4.0	4.5	4.5	4.5	4.0	4.5	4.5
Max Green Setting (Gmax), s	5.5	46.0	15.5	55.5	11.5	40.0	9.5	61.5
Max Q Clear Time (g_c+I1), s	3.9	14.4	14.8	49.4	12.3	2.7	3.9	18.1
Green Ext Time (p_c), s	0.0	2.3	0.1	5.5	0.0	0.0	0.0	12.9

Intersection Summary	
HCM 6th Ctrl Delay	36.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	140	40	149	280	428	60	647	103	384	403	40
Future Volume (veh/h)	80	140	40	149	280	428	60	647	103	384	403	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	84	147	22	157	295	236	63	681	100	404	424	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	128	540	79	218	426	331	94	899	132	568	1323	112
Arrive On Green	0.07	0.17	0.16	0.12	0.22	0.22	0.05	0.29	0.28	0.16	0.40	0.39
Sat Flow, veh/h	1810	3156	464	1795	1916	1490	1810	3152	462	3483	3343	283
Grp Volume(v), veh/h	84	83	86	157	275	256	63	390	391	404	226	234
Grp Sat Flow(s),veh/h/ln	1810	1805	1815	1795	1791	1615	1810	1805	1810	1742	1791	1834
Q Serve(g_s), s	2.8	2.4	2.5	5.1	8.6	8.9	2.1	12.0	12.0	6.7	5.3	5.4
Cycle Q Clear(g_c), s	2.8	2.4	2.5	5.1	8.6	8.9	2.1	12.0	12.0	6.7	5.3	5.4
Prop In Lane	1.00		0.26	1.00		0.92	1.00		0.26	1.00		0.15
Lane Grp Cap(c), veh/h	128	309	311	218	398	359	94	515	516	568	709	726
V/C Ratio(X)	0.66	0.27	0.28	0.72	0.69	0.71	0.67	0.76	0.76	0.71	0.32	0.32
Avail Cap(c_a), veh/h	208	1052	1058	589	1426	1285	134	1428	1432	1744	2181	2234
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	21.9	22.0	25.8	21.8	21.9	28.4	19.9	19.9	24.1	12.7	12.8
Incr Delay (d2), s/veh	5.7	0.2	0.2	4.4	0.8	1.0	3.0	0.9	0.9	0.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.9	1.0	2.2	3.2	3.0	0.9	4.4	4.4	2.6	1.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.3	22.1	22.2	30.2	22.6	22.9	31.4	20.7	20.8	24.8	12.8	12.9
LnGrp LOS	C	C	C	C	C	C	C	C	C	C	B	B
Approach Vol, veh/h		253			688			844			864	
Approach Delay, s/veh		25.8			24.4			21.6			18.4	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	22.2	11.4	13.9	6.7	28.9	8.3	17.0
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0
Max Green Setting (Gmax), s	30.0	47.7	19.5	35.0	4.0	73.7	6.5	48.0
Max Q Clear Time (g_c+I1), s	8.7	14.0	7.1	4.5	4.1	7.4	4.8	10.9
Green Ext Time (p_c), s	0.7	2.8	0.3	0.5	0.0	1.9	0.0	1.9

Intersection Summary	
HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	674	101	277	734	190	82	144	205	120	171	151
Future Volume (veh/h)	152	674	101	277	734	190	82	144	205	120	171	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	160	709	106	292	773	200	86	152	216	126	180	159
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	813	122	323	937	243	116	592	528	159	660	547
Arrive On Green	0.11	0.26	0.26	0.18	0.34	0.33	0.06	0.33	0.33	0.09	0.36	0.35
Sat Flow, veh/h	1781	3101	463	1781	2794	723	1781	1777	1585	1781	1842	1529
Grp Volume(v), veh/h	160	406	409	292	492	481	86	152	216	126	173	166
Grp Sat Flow(s),veh/h/ln	1781	1777	1787	1781	1777	1740	1781	1777	1585	1781	1777	1595
Q Serve(g_s), s	10.6	26.2	26.3	19.3	30.5	30.5	5.7	7.5	12.7	8.3	8.3	9.0
Cycle Q Clear(g_c), s	10.6	26.2	26.3	19.3	30.5	30.5	5.7	7.5	12.7	8.3	8.3	9.0
Prop In Lane	1.00		0.26	1.00		0.42	1.00		1.00	1.00		0.96
Lane Grp Cap(c), veh/h	193	466	469	323	596	584	116	592	528	159	636	571
V/C Ratio(X)	0.83	0.87	0.87	0.90	0.82	0.82	0.74	0.26	0.41	0.79	0.27	0.29
Avail Cap(c_a), veh/h	193	533	536	327	666	653	157	592	528	208	636	571
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Uniform Delay (d), s/veh	52.4	42.3	42.4	48.1	36.6	36.7	55.1	29.2	31.1	53.5	27.4	27.8
Incr Delay (d2), s/veh	25.0	13.3	13.4	26.8	7.6	7.8	11.9	1.0	2.3	13.0	1.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	12.8	12.9	10.7	13.9	13.6	2.9	3.3	5.0	4.2	3.6	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.4	55.6	55.8	74.9	44.2	44.5	67.0	30.2	33.4	66.6	28.4	29.0
LnGrp LOS	E	E	E	E	D	D	E	C	C	E	C	C
Approach Vol, veh/h		975			1265			454			465	
Approach Delay, s/veh		59.3			51.4			38.7			38.9	
Approach LOS		E			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.7	44.0	25.8	35.5	11.8	47.0	17.0	44.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	13.5	31.5	21.5	35.5	10.1	34.9	12.5	44.5				
Max Q Clear Time (g_c+I1), s	10.3	14.7	21.3	28.3	7.7	11.0	12.6	32.5				
Green Ext Time (p_c), s	0.1	1.8	0.0	2.7	0.0	1.8	0.0	4.5				
Intersection Summary												
HCM 6th Ctrl Delay			50.2									
HCM 6th LOS			D									

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	180	819	1040	660	1000	161
Future Volume (veh/h)	180	819	1040	660	1000	161
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	189	862	1095	298	1053	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	240	2190	1526	670	967	443
Arrive On Green	0.13	0.62	0.43	0.42	0.28	0.28
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	189	862	1095	298	1053	70
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	7.9	9.4	19.5	10.3	21.5	2.6
Cycle Q Clear(g_c), s	7.9	9.4	19.5	10.3	21.5	2.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	240	2190	1526	670	967	443
V/C Ratio(X)	0.79	0.39	0.72	0.44	1.09	0.16
Avail Cap(c_a), veh/h	313	4184	3375	1495	967	443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	7.5	18.1	15.8	27.7	20.9
Incr Delay (d2), s/veh	9.6	0.1	0.6	0.5	56.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	2.7	7.0	3.3	15.5	2.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.8	7.6	18.7	16.2	84.1	21.6
LnGrp LOS	D	A	B	B	F	C
Approach Vol, veh/h		1051	1393		1123	
Approach Delay, s/veh		13.7	18.2		80.2	
Approach LOS		B	B		F	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				51.4		25.5	14.4	37.0
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				90.0		21.0	13.0	72.5
Max Q Clear Time (g_c+I1), s				11.4		23.5	9.9	21.5
Green Ext Time (p_c), s				6.6		0.0	0.1	11.0

Intersection Summary	
HCM 6th Ctrl Delay	36.4
HCM 6th LOS	D

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	552	1037	959	280	1560	651
Future Volume (veh/h)	552	1037	959	280	1560	651
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	563	1058	979	131	1592	450
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	434	2928	1073	484	1241	564
Arrive On Green	0.24	0.57	0.30	0.31	0.36	0.35
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598
Grp Volume(v), veh/h	563	1058	979	131	1592	450
Grp Sat Flow(s),veh/h/ln	1781	1702	1777	1585	1742	1598
Q Serve(g_s), s	35.0	16.0	38.1	9.0	51.2	36.5
Cycle Q Clear(g_c), s	35.0	16.0	38.1	9.0	51.2	36.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	434	2928	1073	484	1241	564
V/C Ratio(X)	1.30	0.36	0.91	0.27	1.28	0.80
Avail Cap(c_a), veh/h	434	3152	1229	554	1241	564
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.3	16.5	48.3	37.8	46.2	41.9
Incr Delay (d2), s/veh	150.0	0.0	8.9	0.1	133.5	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	33.4	6.0	17.7	3.5	44.3	15.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	204.4	16.5	57.2	37.9	179.7	49.2
LnGrp LOS	F	B	E	D	F	D
Approach Vol, veh/h		1621	1110		2042	
Approach Delay, s/veh		81.8	54.9		151.0	
Approach LOS		F	D		F	

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		87.7			39.0	48.7		56.0
Change Period (Y+Rc), s		5.3			4.5	5.3		5.3
Max Green Setting (Gmax), s		88.7			34.5	49.7		50.7
Max Q Clear Time (g_c+I1), s		18.0			37.0	40.1		53.2
Green Ext Time (p_c), s		5.1			0.0	3.2		0.0

Intersection Summary		
HCM 6th Ctrl Delay		105.1
HCM 6th LOS		F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	785	1812	0	0	528	1120	711	10	410	0	0	0
Future Volume (veh/h)	785	1812	0	0	528	1120	711	10	410	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	826	1907	0	0	556	795	756	0	397			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	888	3223	0	0	638	1082	1005	0	447			
Arrive On Green	0.26	0.63	0.00	0.00	0.34	0.34	0.28	0.00	0.28			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	826	1907	0	0	556	795	756	0	397			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	24.9	23.7	0.0	0.0	29.8	23.6	20.9	0.0	26.0			
Cycle Q Clear(g_c), s	24.9	23.7	0.0	0.0	29.8	23.6	20.9	0.0	26.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	888	3223	0	0	638	1082	1005	0	447			
V/C Ratio(X)	0.93	0.59	0.00	0.00	0.87	0.73	0.75	0.00	0.89			
Avail Cap(c_a), veh/h	891	4541	0	0	1120	1898	1495	0	665			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	39.1	11.9	0.0	0.0	33.4	31.3	35.0	0.0	36.8			
Incr Delay (d2), s/veh	15.6	0.1	0.0	0.0	1.5	0.4	0.5	0.0	7.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.0	7.7	0.0	0.0	13.0	8.6	8.6	0.0	21.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	12.0	0.0	0.0	34.8	31.7	35.5	0.0	44.0			
LnGrp LOS	D	B	A	A	C	C	D	A	D			
Approach Vol, veh/h		2733			1351			1153				
Approach Delay, s/veh		24.9			33.0			38.4				
Approach LOS		C			C			D				

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		72.2		35.4	30.9	41.2		
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3		
Max Green Setting (Gmax), s		94.4		45.0	27.0	63.4		
Max Q Clear Time (g_c+I1), s		25.7		28.0	26.9	31.8		
Green Ext Time (p_c), s		13.2		2.1	0.0	4.2		

Intersection Summary	
HCM 6th Ctrl Delay	30.0
HCM 6th LOS	C

Notes
User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	137	0	0	220	200	221
Future Vol, veh/h	137	0	0	220	200	221
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	144	0	0	232	211	233

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	444	222	444	0	-	0
Stage 1	328	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	542	782	1112	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	896	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	542	782	1112	-	-	-
Mov Cap-2 Maneuver	542	-	-	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	896	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1112	-	542	-	-
HCM Lane V/C Ratio	-	-	0.266	-	-
HCM Control Delay (s)	0	-	14	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	1.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	40	200	20	30	10	20	528	20	20	623	163
Future Volume (veh/h)	195	40	200	20	30	10	20	528	20	20	623	163
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	207	43	213	21	32	11	21	562	21	21	663	173
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	240	426	361	68	175	60	68	1083	483	68	1083	483
Arrive On Green	0.13	0.23	0.23	0.04	0.13	0.12	0.04	0.30	0.30	0.04	0.30	0.30
Sat Flow, veh/h	1781	1870	1585	1781	1331	457	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	207	43	213	21	0	43	21	562	21	21	663	173
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1788	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.7	0.7	4.9	0.5	0.0	0.9	0.5	5.3	0.4	0.5	6.5	3.5
Cycle Q Clear(g_c), s	4.7	0.7	4.9	0.5	0.0	0.9	0.5	5.3	0.4	0.5	6.5	3.5
Prop In Lane	1.00		1.00	1.00		0.26	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	426	361	68	0	235	68	1083	483	68	1083	483
V/C Ratio(X)	0.86	0.10	0.59	0.31	0.00	0.18	0.31	0.52	0.04	0.31	0.61	0.36
Avail Cap(c_a), veh/h	240	846	717	240	0	809	240	1695	756	240	1695	756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	12.5	14.1	19.1	0.0	15.9	19.1	11.7	10.0	19.1	12.1	11.1
Incr Delay (d2), s/veh	26.3	0.1	1.5	2.5	0.0	0.4	2.5	0.4	0.0	2.5	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.3	1.6	0.2	0.0	0.3	0.2	1.5	0.1	0.2	1.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	12.6	15.6	21.7	0.0	16.2	21.7	12.1	10.1	21.7	12.7	11.5
LnGrp LOS	D	B	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h		463			64			604			857	
Approach Delay, s/veh		27.8			18.0			12.4			12.7	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	16.5	5.6	13.3	5.6	16.5	9.5	9.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.5	7.3	2.5	6.9	2.5	8.5	6.7	2.9
Green Ext Time (p_c), s	0.0	2.7	0.0	0.7	0.0	3.4	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	16.3
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	150	85	51	120	100	185	682	185	310	640	110
Future Volume (veh/h)	100	150	85	51	120	100	185	682	185	310	640	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	109	163	80	55	130	91	201	741	181	337	696	107
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	140	258	127	70	183	128	244	934	228	377	1251	192
Arrive On Green	0.08	0.22	0.22	0.04	0.18	0.18	0.13	0.33	0.31	0.21	0.40	0.38
Sat Flow, veh/h	1810	1198	588	1810	1034	724	1810	2870	701	1810	3133	481
Grp Volume(v), veh/h	109	0	243	55	0	221	201	466	456	337	401	402
Grp Sat Flow(s),veh/h/ln	1810	0	1786	1810	0	1758	1810	1805	1766	1810	1805	1809
Q Serve(g_s), s	4.5	0.0	9.3	2.3	0.0	9.0	8.2	17.8	17.8	13.7	13.0	13.1
Cycle Q Clear(g_c), s	4.5	0.0	9.3	2.3	0.0	9.0	8.2	17.8	17.8	13.7	13.0	13.1
Prop In Lane	1.00		0.33	1.00		0.41	1.00		0.40	1.00		0.27
Lane Grp Cap(c), veh/h	140	0	385	70	0	311	244	588	575	377	721	722
V/C Ratio(X)	0.78	0.00	0.63	0.78	0.00	0.71	0.82	0.79	0.79	0.89	0.56	0.56
Avail Cap(c_a), veh/h	263	0	873	239	0	836	454	954	933	406	906	908
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	0.0	26.9	36.0	0.0	29.3	31.9	23.2	23.5	29.1	17.6	17.7
Incr Delay (d2), s/veh	3.5	0.0	0.6	6.8	0.0	1.1	2.7	0.9	1.0	19.5	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	3.7	1.1	0.0	3.6	3.5	6.8	6.8	7.5	4.7	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.8	0.0	27.6	42.9	0.0	30.4	34.6	24.1	24.4	48.6	17.8	18.0
LnGrp LOS	D	A	C	D	A	C	C	C	C	D	B	B
Approach Vol, veh/h		352			276			1123			1140	
Approach Delay, s/veh		30.7			32.9			26.1			27.0	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	28.6	6.9	20.3	14.2	34.2	9.9	17.4
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0
Max Green Setting (Gmax), s	17.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0
Max Q Clear Time (g_c+I1), s	15.7	19.8	4.3	11.3	10.2	15.1	6.5	11.0
Green Ext Time (p_c), s	0.1	3.3	0.0	0.8	0.2	2.8	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	891	460	286	900	270	381	489	283	380	413	40
Future Volume (veh/h)	100	891	460	286	900	270	381	489	283	380	413	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	109	968	223	311	978	102	414	532	248	413	449	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	134	1189	273	337	1891	197	405	633	294	463	957	76
Arrive On Green	0.07	0.28	0.27	0.19	0.40	0.39	0.12	0.27	0.26	0.13	0.28	0.27
Sat Flow, veh/h	1810	4189	962	1810	4772	497	3510	2379	1105	3510	3384	270
Grp Volume(v), veh/h	109	799	392	311	708	372	414	403	377	413	239	246
Grp Sat Flow(s),veh/h/ln	1810	1729	1693	1810	1729	1811	1755	1805	1679	1755	1805	1849
Q Serve(g_s), s	7.2	26.1	26.3	20.5	18.9	19.0	14.0	25.6	25.8	14.1	13.3	13.4
Cycle Q Clear(g_c), s	7.2	26.1	26.3	20.5	18.9	19.0	14.0	25.6	25.8	14.1	13.3	13.4
Prop In Lane	1.00		0.57	1.00		0.27	1.00		0.66	1.00		0.15
Lane Grp Cap(c), veh/h	134	982	481	337	1370	717	405	481	447	463	510	523
V/C Ratio(X)	0.81	0.81	0.82	0.92	0.52	0.52	1.02	0.84	0.84	0.89	0.47	0.47
Avail Cap(c_a), veh/h	164	1196	586	373	1595	835	405	609	567	463	639	655
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.4	40.5	40.9	48.5	27.8	28.0	53.7	42.1	42.6	51.9	36.0	36.1
Incr Delay (d2), s/veh	18.4	3.0	6.1	25.5	0.1	0.2	50.7	6.7	7.5	18.7	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	11.1	11.4	11.3	7.5	8.0	8.9	11.9	11.3	7.2	5.7	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.8	43.5	47.0	74.0	27.9	28.2	104.4	48.8	50.0	70.6	36.2	36.4
LnGrp LOS	E	D	D	E	C	C	F	D	D	E	D	D
Approach Vol, veh/h		1300			1391			1194			898	
Approach Delay, s/veh		47.1			38.3			68.5			52.1	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	36.3	26.6	38.5	18.0	38.3	13.0	52.1
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7
Max Q Clear Time (g_c+I1), s	16.1	27.8	22.5	28.3	16.0	15.4	9.2	21.0
Green Ext Time (p_c), s	0.0	2.4	0.1	4.1	0.0	1.6	0.0	4.6

Intersection Summary	
HCM 6th Ctrl Delay	50.8
HCM 6th LOS	D

APPENDIX C: APPROVED/PENDING PROJECT INFORMATION

Vineyards at Deer Creek
Approved and Pending Projects Trip Generation

1. TSM 8506 (Discovery Builders) Bridle Gate (Vistro Zones 56+57)

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	265	2520	50	149	199	167	98	265
Elementary School		700	900	173	142	315	51	54	105
Apartment (Enclave)	220	258	1720	26	106	132	104	56	160
Retail	820	150	6410	89	55	144	267	290	557
Less Pass-by		-25%	-1600	-18	-18	-36	-70	-70	-140
Net-New Retail			4810	71	37	108	197	220	417
Net NEW Trips			9950	320	434	754	519	428	947

2. TSM 9451/DR 16-020 Pioneer Square (Vistro Zone 63)

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Active Adult - Attached		72	270	5	9	14	10	9	19

2. Trilogy at the Vineyards (TSM 8796/DR06-02) (Vistro Zone 63)

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU Active Adult		707	3020	56	114	170	129	83	212

4. Sciortino (Vistro Zone 64)

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family	220	326	3080	60	181	241	203	120	323
Retail	820	126	4760	73	45	118	230	250	480
Less Pass-by		-50%	-2380	-30	-30	-60	-120	-120	-240
Net-New Retail			2380	43	15	58	110	130	240
			5460	103	196	299	313	250	563

5. Streets of Brentwood (Vistro Zone 65)

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Apartment	220	320	2340	34	113	147	113	66	179
Retail	820	32	1210	19	11	30	59	63	122
Less Pass-by		-25%	-300	-4	-4	-8	-16	-15	-31
Net-New Retail			910	15	7	22	43	48	91
			3250	49	120	169	156	114	270

6. PDP-13-01 Heidorn Village (Vistro Zone 45)

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	117	1100	22	65	87	73	43	116

11. PDP-13-01 Quail Ridge (Vistro Zone 46)

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	32	300	6	18	24	20	12	32

7. R-16-02 Aviano (Vistro Zone 43)

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	533	5030	99	295	394	333	195	528

8. GP-14-01 Vineyards at Sand Creek (Vistro Zone 62)

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Age Restricted - Detached		440	1880	35	71	106	81	51	132

Single Family - Detached DU	210	192	1810	36	106	142	120	70	190
			3690	71	177	248	201	121	322

3. Community College Phase 1(Vistro Zone 66)

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Community College	210	2500	5580	342	108	450	236	139	375

10. Laurel Ranch

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	178	1680	33	99	132	111	65	176
Retail	820	10	380	6	3	9	18	20	38
Less Pass-by		-25%	-100	-1	-1	-2	-5	-5	-10
Net-New Retail			280	5	2	7	13	15	28
			1960	38	101	139	124	80	204

11. Quail Cove

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	32	300	6	18	24	20	12	32

12. Park Ridge

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	178	1680	33	99	132	111	65	176

12. The Ranch

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	755	7130	140	419	559	471	276	747
Age Restricted Single Family Homes[1]		422	1800	33	68	101	77	50	127
Fire Station			20	1	1	2	1	1	2
General Commercial[3]		54000	2040	32	19	51	99	107	206
			10990	206	507	713	648	434	1082

13. TSM 9428 (Richland Communities) Orfanos

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	160	1520	30	90	120	101	59	160

14. TSM 9412 (Alvernaz Partners)

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	48	460	9	27	36	30	18	48

15. Chick-Fil-A

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Grocery Store	850	31	3,170	65	40	105	150	144	294
High Turnover Resturaunt	932	5.74	730	6	1	7	34	23	57
Drive Thru	934	12.75	6,330	295	284	579	216	200	416
Automated Car Wash	948	4.33	520	22	22	44	31	31	61
			10,750	389	347	736	431	397	828
Pass by trips			(4,460)	(169)	(156)	(326)	(170)	(155)	(325)
Total Estimated Trip Gen			6,290	220	191	410	261	242	503

APPENDIX D: SIGNAL WARRANT WORKSHEETS

FEHR PEERS

Project	Albers Ranch
Major Street	Hillcrest Avenue
Scenario	Cumulative + Project
Minor Street	Project Driveway
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	0	200	0
Through	230	70	0	0
Right	0	63	0	0
Total	230	133	200	0

Major Street Direction

X	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	11.8
Approach with Worst Case Delay	EB
Total Vehicles on Approach	200

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Cumulative + Project	**0.7**	**200**	**563**
Limiting Value	**4**	**100**	**650**
Condition Satisfied?	**Not Met**	**Met**	**Not Met**
Warrant Met	**NO**		

FEHR & PEERS

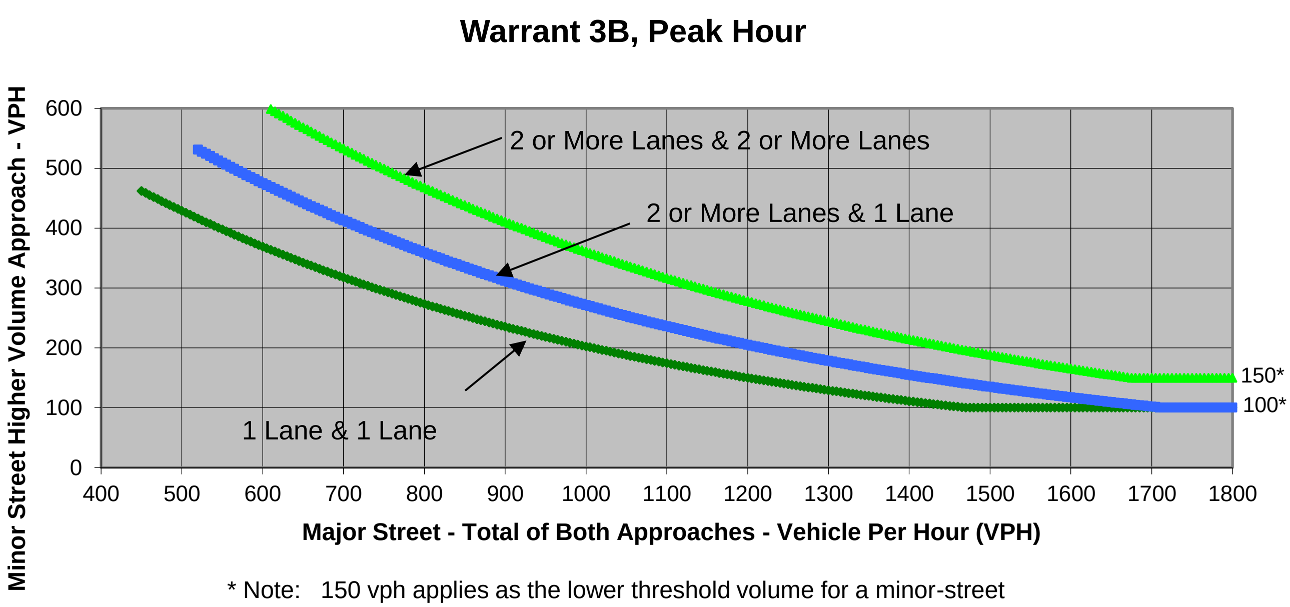
Major Street	Hillcrest Avenue		Project	Albers Ranch
Minor Street	Project Driveway		Scenario	Cumulative + Project
			Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	0	200	0
Through	230	70	0	0
Right	0	63	0	0
Total	230	133	200	0

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Hillcrest Avenue	Minor Street Project Driveway	Warrant Met
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**363**	**200**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR & PEERS

			Project	Albers Ranch
Major Street	Hillcrest Avenue		Scenario	Cumulative + Project
Minor Street	Project Driveway		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	0	137	0
Through	220	200	0	0
Right	0	221	0	0
Total	220	421	137	0

Major Street Direction

X	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	14
Approach with Worst Case Delay	EB
Total Vehicles on Approach	137

Warrant 3A, Peak Hour

	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Cumulative + Project	**0.5**	**137**	**778**
Limiting Value	**4**	**100**	**650**
Condition Satisfied?	**Not Met**	**Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

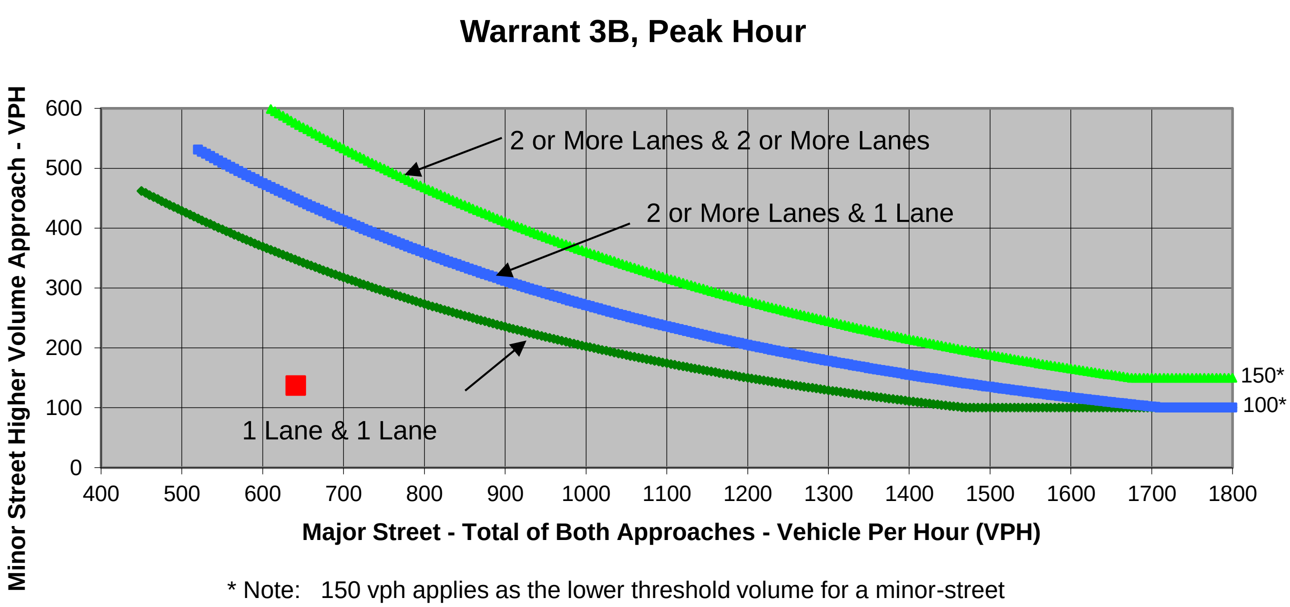
		Project	Albers Ranch
Major Street	Hillcrest Avenue	Scenario	Cumulative + Project
Minor Street	Project Driveway	Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	0	137	0
Through	220	200	0	0
Right	0	221	0	0
Total	220	421	137	0

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Hillcrest Avenue	**Minor Street** Project Driveway	**Warrant Met**
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**641**	**137**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.