

II. ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

This chapter presents the environmental setting of the project for the various impact topics of concern, evaluates potential impacts associated with the development of the proposed project, and identifies feasible mitigation measures, as applicable and available, to avoid the impacts or to reduce their severity to less-than-significant levels. Since this document is a Subsequent EIR which provides updated information and analysis for the previous Mitigated Negative Declaration for the project, the following discussions of setting, impacts, and mitigations focuses on changes to the project and its circumstances which have occurred since the adoption of the MND in 1998, and summarizes the discussion contained in the MND as appropriate. In particular, all of the impacts and mitigation measures identified in the previous IS/MND are presented in this EIR in order to provide a comprehensive listing of impacts and mitigation measures applicable to the planned expansion project. The environmental topics are presented in the order they appear in Appendix G of the current CEQA Guidelines.

A. AESTHETICS

ENVIRONMENTAL SETTING

The pre-project visual conditions on the project site and surrounding lands have changed considerably from those described in the 1998 IS/MND. At that time, the Walmart site was entirely vacant, and much of the adjacent land to the east and southeast was also undeveloped and rural in appearance. Under current conditions, much of the original site is now largely occupied by the existing Walmart store and adjacent parking, loading, and circulation areas, except for the 3.7-acre expansion area which is still vacant. The nearby lands to the east and southeast have largely been developed, or are currently under development. (Much of the formerly vacant land extending to the Brentwood City boundary (and beyond) has been developed for single- and multi-family residential and commercial retail projects.) There is no substantial vacant land remaining in the project vicinity. As such, the vacant 3.7-acre expansion site appears as a vacant infill site within an otherwise urbanized area.

Overall, the visual quality of the project area is typical for suburban development. There are no outcroppings or significant trees on or adjacent to the project site, and there are no designated scenic roads in the project vicinity. The primary community landmarks, such as Mount Diablo and the Antioch Bridge, are not visible from the project site. However, Williamson Ranch Park, which is a local landmark with several historic buildings on approximately one acre, is located on the south side of Lone Tree Way just west of Hillcrest Avenue.

The Williamson Ranch Plaza has been largely built-out and has the appearance of a typical modern community shopping center. The nearby residential areas to the north and south consist of conventional single-family neighborhoods and have not changed in general appearance since 1998. Prior to the development of the Walmart site and the other portions of the Williamson Ranch Plaza, the openness of the site provided residences immediately to the north with views from their second floor rear windows overlooking the site to the low hills beyond. With the development of the Walmart store and other portions of the Williamson Ranch Plaza, those views are now entirely or partially blocked by intervening buildings. Since the 3.7-acre project expansion area is currently vacant, limited views across the site are still available for about 11 existing homes on the north side of the creek channel. However, even homes with the best remaining views have less than a 50 percent horizontal (side to side) viewing area between the existing

Walmart and the OSH buildings. As one moves east or west of the homes with the widest remaining viewing angles, the views become increasingly narrow and oblique. For about half of these homes, the lower portions of the foreground views are screened by the existing masonry wall along the rear Walmart property line. Additionally, even in the unobstructed portions of the existing views, the visual content primarily consists of developed shopping center, the heavily-traveled Lone Tree Way corridor beyond, and the residential development in the distance. (Additionally, the scenic quality of the low hillside in the background has been diminished by housing constructed along the ridgeline.) In summary, the content of these remaining limited views is entirely suburban in nature, and contains no scenic or otherwise visually important elements.

REGULATORY SETTING

California Scenic Highway Program

California's Scenic Highway Program was created in 1963 to preserve and protect scenic highway corridors from change which would diminish the aesthetic value of lands adjacent to highways. The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. Within Contra Costa County, there are three highway segments which are designated by the state as either officially designated scenic highways or eligible scenic highways. The segment of Highway 680 extending north from the Alameda County line to the junction of Highway 24, and the segment of Highway 24 from Highway 680 east to the Alameda County line are an officially designated State Scenic Highways, and the segment of Highway 4 extending east from Highway 160 through Oakley and Brentwood is designated as an Eligible State Scenic Highway.

City of Antioch General Plan

The Community Image and Design Element of the City of Antioch General Plan contains the following objectives and policies which are relevant to the project.

5.4.1 Community Design Objective

Preserve and enhance Antioch's visual character, including its natural features, hillsides, distinct districts, and entries and major roadways by carrying a community theme into the design of new developments and public facilities.

5.4.2 General Design Policies

- a. Base the City's review of public and private projects on the following general design principles.
 - Innovative design, regardless of its style, is more important to the achievement of "quality" than the use of predetermined themes.
 - High quality comes from the explicit consideration of all aspects of development design. It is in design details that "quality" is ultimately manifested.
 - Designers need to respect community goals and needs, as well as address their client's economic objectives.

- Individual buildings and developments are not isolated entities, but are part of a large district and community into which they must fit. While innovation and individual expression are sought, compatibility of design elements is also important.
 - Standardized design solutions, “corporate architecture,” and “off the shelf models” cannot always be depended upon. What worked before or was accepted elsewhere may not work or be acceptable in the proposed application in Antioch.
 - Architectural styles, landscaping, and project amenities should complement surrounding development, and convey a sense of purpose, not expediency.
 - All building elevations visible to the public should be given equal attention and detail.
 - The same design solution, no matter how well done, when repeated too often or over too large an area, can become boring, lose its effectiveness, and no longer communicate “quality.”
- j. Within multi-family, commercial, office and business parks, and industrial developments, screen enclosure, loading areas, mechanical equipment, and outdoor storage areas from view from public streets, and, as appropriate, from other public views.
- Ground mounted equipment incidental to multi-family, commercial, office, and business park development shall be appropriately screened with solid walls, trellises, and/or landscaping. Equipment location should be away from the front of the building, and screening must be similar to adjacent architecture and materials.
 - Refuse collection areas are to be large enough to accommodate storage of recyclable materials, and be screened with a *solid* perimeter wall using materials and colors compatible with those of adjacent structures. Refuse collection areas should be located on an interior building side yard, and are to be roofed if the contents of the area are visible from a freeway.
 - Loading docks and areas, as well as trash enclosure areas shall be screened from public view areas. When there is adjacent residential development, loading and trash enclosure areas shall be physically separated and screened from adjacent residential structures.
 - Service areas, including storage, special equipment, outdoor work areas, and loading areas, should be screened from public view with landscaping *and* architectural elements.
 - Screen utility equipment and communication devices so that the project will appear free of all such devices
- k. Prohibit roof-mounted equipment (with the exception of small satellite dishes and solar panels) for single-family residential development consistent with FCC regulations.
- Where required for commercial, office, and industrial development, screen roof-mounted equipment and cellular antennas completely from public view on all sides. Particular attention shall be given to the sides visible from freeways, with the intent of minimizing the need for screening devices to the greatest extent possible.

- l. Screening of roof-mounted equipment and cellular antennas, where provided, should be an integral part of the building design and not appear as a tacked-on afterthought. Ground-mounted mechanical equipment (with appropriate wall of landscape screening) is encouraged as an alternative to roof mounting.
- m. All roof screens must be solid and continuous. Continuous grills or louvers must cover equipment. Roof screens will be sheathed in a matching or complementary material to the exterior building material.
- n. Utilize street lights in commercial, office, and business park areas that are pedestrian-oriented, attractively designed, compatible in design with other street furniture, and provide adequate visibility and security.
- o. Design onsite lighting to improve the visual identification of adjacent structures.
 - Within commercial areas, lighting should also help create a festive atmosphere by encouraging evening use of areas by pedestrians.
 - Within commercial and industrial development, provide design features such as screened walls, landscaping, setbacks, and lighting restrictions between the boundaries of adjacent residential land use designations to reduce the impacts of light and glare.
 - In all projects, lighting fixtures should be attractively designed and of a low profile to complement the overall design theme of the project with which they are located.
 - On-site lighting shall create a safe environment, adhering to established crime prevention standards, but shall not result in nuisance levels of light or glare on adjacent properties. Limit sources of lighting to the minimum required to ensure safe circulation and visibility.

5.4.6 General Architectural Design Policies

- a. The size, height, bulk, and location of buildings are to be managed in relation to the size of the parcel and overall site design to avoid a crowded appearance, and preserve a visual appearance of openness.
- b. Building forms and elevations should create interesting roof silhouettes, strong patterns of light and shadow, and integral architectural detail. Box-like structures and flat monotonous facades are to be avoided.
- c. Encourage a harmonious appearance of new development with the surrounding environment and existing developments based on compatibility of individual structures rather than one specific style of architecture.
- d. Uniform materials and compatible style should be evident with a development project in all exterior elevations. Secondary accent materials and colors should be used to highlight building features and provide visual interest.

5.4.8 Commercial Development

- a. Avoid strip patterns of commercial development, and improve the appearance and functioning of existing commercial strip corridors, such as “A” Street, 10th Street between “G” and “L.”

- c. Incorporate variations in setbacks and in massing of building bulk along major streets to provide variety and visual interest to the streetscape.
- d. Provide adequate lighting for the security and safety of on-site parking, loading and pedestrian areas as well as adequate screening where such aesthetic treatment is required and can be provided without compromising the surveillance of such areas for safety and security purposes.
- e. Develop commercial projects in a manner that is architecturally harmonious with a defined theme, and in accordance with the following design guidelines:
 - Materials, textures, colors, and architectural detailing shall be consistent with the specific design themes employed in the project.
 - Architectural elements, such as variations in rooflines and building masses broken into smaller components, are encouraged.
 - Recesses, reveals, projections, architectural trim, and other elements are encouraged to enhance the architectural image of structures.
 - Shadow patterns created by architectural elements such as overhangs, projections, or recession of stories, balconies, reveals, and awnings are encouraged in order to contribute to a building's character and aid in climate control.
- f. The following design elements are encouraged in conjunction with the design and construction of commercial and office buildings.
 - Richness of surface and texture.
 - Equal solid-to-void building wall ratios.
 - Multi-planed, pitched roofs.
 - Vegetation integrated with building walls and details such as trellises.
 - Roof overhangs.
 - Regular or traditional window rhythms.
- g. The following architectural elements are to be discouraged in large expanses of the same monotonous patterns in conjunction with the construction of commercial and office buildings:
 - Highly reflective surfaces over the majority of the façade visible to the public.
 - Large, blank walls.
 - Flat roofs without mansards.
 - Split face or exposed concrete block.

- Metal or plastic siding.

1. Mechanical plants and distribution networks shall be minimized and contained within efficient rooftop penthouses.

5.4.12 Development Transitions and Buffering Policies

[These policies are focused on protecting existing and planned residential uses from the effects of adjacent land uses.]

- a. Minimize the number and extent of locations where non-residential land use designations abut residential land use designations. Where such relationships cannot be avoided, strive to use roadways to separate the residential and non-residential uses.
- b. Ensure that the design of new development proposed along a boundary between residential and non-residential uses provides sufficient protection and buffering for the residential use, while maintaining the development feasibility of the non-residential use. The burden to provide buffers and transitions to achieve compatibility should generally be on the second use to be developed. Where there is bare ground to start from, both uses should participate in providing buffers along the boundary between them.
- c. Provide appropriate buffering to separate residential and non-residential uses, using one or more of the following techniques as appropriate.
 - Increase setbacks along roadways and common property lines between residential/non-residential uses.
 - Provide a heavily landscaped screen along the roadway or common property line separating residential and non-residential use.
 - Locate noise-generating activities such as parking areas; loading docks; and service, outdoor storage, and trash collection areas as far from residential uses as possible.
- g. Uninterrupted fences and walls are to be avoided, unless they are needed for a specific screening, safety, or sound attenuation purposes.
- h. Where they are needed, fences or walls should relate to both the site being developed and surrounding developments, open spaces, streets, and pedestrian ways.
- i. Fencing and walls should respect existing view corridors to the greatest extent possible.
- j. Fencing and walls should incorporate landscape elements or changes in materials, color, or texture in order to prevent graffiti, undue glare, heat, or reflecting, or aesthetic inconsistencies.

5.4.15 Landscaping

- a. Landscape design should accent the overall design theme and help to reinforce the pedestrian scale of the project. This could be accomplished through the use of structures, arbors, and trellises that are appropriate to the particular architectural style of the project. Pedestrian amenities should be provided throughout the project including benches, trash receptacles, and lighting.

- e. Landscaping should be designed as an integral part of the overall site plan design. Landscaping and open spaces should not be relegated to pieces of the site left over after buildings, parking, and circulation have been laid out.

Zoning Code

The City of Antioch Zoning Code includes a number of provisions related to the enhancement of visual quality of development and the reduction or avoidance of aesthetic impacts and conflicts with adjacent uses. Most notable among these are the Sign Regulations (which minimizes obtrusiveness and promotes visual quality of signs), the Parking Requirements (which prohibit direct illumination of off-site areas by parking lot lighting, require a landscape island for every 10 consecutive parking spaces, and require screening from adjacent streets with landscaping), screening requirements for mechanical equipment and outdoor storage, design guidelines for refuse storage areas, landscaping requirements and design standards, among other things.

Design Review

Under Article 26 of the City of Antioch Zoning Code, all new development is subject to design review. The purpose of design review is to: *“promote the orderly and harmonious development of the city, the stability of land values and investments, and the general welfare and to encourage and promote the highest quality of design and site planning to delight the user and others who come in contact with uses and structures in the city”* (Zoning Code §9-5.2701(B)). Proposed projects are evaluated based on General Plan and Zoning design policies and criteria, with the goal of having new projects harmonize with the natural environment and the surrounding area.

Williamson Ranch Plaza Development Standards and Sign Criteria

The form and appearance of the planned expansion is further governed by the Williamson Ranch Plaza Development Standards and the Williamson Ranch Plaza Sign Criteria, both of which were approved by City Council in 1998.

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines, Appendix G, the project would be considered to have a significant aesthetic impact if it would:

- Have a substantial adverse effect on a scenic vista.
- Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- Substantially degrade the existing visual character or quality of the site and its surroundings.
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

[Note: Of the four significance criteria listed above, only the third and fourth ones are associated with a potentially significant impact. For the first two checklist items, the initial scoping for this EIR determined that the project would result in no impacts or less-than-significant impacts with respect to these items. The determinations related to each of these items are discussed briefly in Section III. *Effects Found Not to Be Significant.*]

IMPACTS AND MITIGATION

Project-Specific Impacts

Impact A1. Visual Change Resulting from Project. The project would result in a change to the visual character of the site; however, this would not represent a significant adverse visual impact. (Less-than-Significant Impact)

The expansion project will result in the conversion of the 3.7-acre expansion site from a vacant parcel to commercial shopping center use with building, parking, loading, circulation, and landscaped areas. Since the expansion site is relatively small and is surrounded by existing commercial and residential development as well as major roadways and flood control facilities, the visual change to the setting resulting from its development would not be substantial. Therefore, the project would not have the visual effect associated with intrusion of new urbanization into an area characterized by pristine rural open space, for example. As such, the overall visual and aesthetic impact associated with the development of the expansion area will be *less than significant*.

For travelers along Lone Tree Way, the view of the project site would be somewhat altered in that the Walmart building would be expanded westward and parking area would be added. However, the overall visual effect is reduced due to the distance of the expansion area from Lone Tree Way (300 feet), as well as the landscaping along the southern portion of the expansion area, and throughout the Walmart site, including the perimeter landscaping along the street frontages. From Hillcrest Avenue to the east, the expansion project will be entirely screened from view by the existing Walmart building. Therefore, the aesthetic and visual impact of the planned expansion upon travelers along the adjacent roadways will be *less than significant*.

Some of the nearest 11 residences to the north across the flood control channel, which currently have views across the vacant site from their second floor rear windows, will have their views reduced by varying degrees by the building expansion. In addition, the lower portion of these views will be partially screened by the 8-foot high soundwall to be constructed along the north boundary of the expansion area. However, the existing views from all of these residences are of very limited quality, being entirely suburban in character and lacking in scenic or otherwise visually important features. Thus the project would result in varying degrees of screening of limited and unscenic views for a few existing residents from their second story bedroom windows. This would represent a *less than significant* impact of the project.

The area north of the expanded building will include a new loading dock, as well as a new transformer, a relocated trash compactor, and storage of shipping pallets. The 8-foot masonry wall to be constructed along the north boundary of the expansion area will screen these project elements from view of the nearest residences to the north. The wall will be

constructed of textured and colored masonry block matching the appearance of the existing screen walls. In addition, the new refrigerator compressor units planned along the west wall of the expanded building will be entirely enclosed by a masonry screen wall and will not be visible from off-site locations. Similarly, the rooftop mechanical equipment will be located away from the building edge and screened such that it is not visible from off-site locations. As such, any visual and aesthetic impacts associated with project elements north of the expanded building or on the rooftop will be *less-than-significant*.

The expansion project will be accompanied by extensive renovations to the exterior of the existing Walmart. The south/front façade of the Supercenter will be completely remodeled with a greater degree of articulation and detailing to create a more pedestrian scale and a higher quality of design. The redesigned store front is also intended to visually integrate the existing building with the expansion area through a unified design theme. The planned expansion and related building and site modifications will be required to conform to the Williamson Ranch Plaza Development Standards, as previously approved by the City of Antioch.

The existing light standards on the Walmart site will be replaced by lower profile light standards (see Impact A2 below for discussion). Also, some new signage will be added and some existing signs will be updated. All project signage will be required to conform to the Williamson Ranch Plaza Sign Criteria, as previously approved by the City of Antioch.

In general, the planned improvements would be generally consistent with the applicable General Plan policies cited under “Regulatory Context” above. The building elevations (Figure 6) and perspective drawing (Figure 8) show building articulation, variation in colors and textures, and architectural relief from large uninterrupted walls. However, questions of design and aesthetic style are generally not subject to review under CEQA unless they result in a clearly definable significant aesthetic impact. There are no design or architectural aspects or elements of the proposed expansion which would result in a significant visual or aesthetic impact under CEQA. The non-CEQA issues, such as appropriateness and quality of design and architectural detail, will be subject to design review. This review and approval process will ensure that the aesthetic and design aspects of the project will be consistent with City of Antioch standards, including the Williamson Ranch Plaza Design Standards and Sign Criteria which were previously approved for the project by the City.

In summary, while the project would result in a change to the visual setting and would have a minor effect on views from a few nearby residences, the resulting visual and aesthetic impacts would be *less than significant*.

Mitigation. **No mitigation required.**

Impact A2. **Lighting and Glare.** **Lighting for the project building, parking lot, and loading areas could produce light and glare at off-site locations; however, the effects of lighting and glare would be minimized through compliance with the applicable City requirements and standards. (Less-than-Significant Impact)**

II. Environmental Setting, Impacts, and Mitigation Measures

A. Aesthetics

The project will require full-coverage lighting throughout the parking areas, and lighting to illuminate buildings and signage. Potentially sensitive receptors to unwanted illumination and glare from the project primarily include the existing residences on the north side of the creek channel, and to a lesser extent motorists along the adjacent roadways.

Parking lot lighting in the expansion area will be provided by light standards with a total height of 20 feet (i.e., 17-foot pole on 3-foot base). In addition, all of the existing 40-foot high light standards in the existing parking area will be removed and replaced with the same 20-foot high light standards. The lights will include 400-watt energy-efficient light fixtures (the existing lights are 1,000 watts), and will be fitted with cut-off shields along the site perimeter to avoid direct illumination spilling beyond the site boundaries. Along the rear of the building, light fixtures will be mounted about 12-feet high on the wall. These lights will also be downward directed, shielded, and fitted with low-wattage light bulbs. The primary intent of these modifications is to minimize the intensity and visibility of night lighting at the nearby residential properties to the north while still providing sufficient light within the project site for security and safety purposes. Photometric plans submitted by the project engineer indicate that the intensity of lighting would be no greater than 3 foot candles just outside the north site boundary, and would be 0 foot candles on the north side of the creek channel adjacent to the residential soundwall.

Project signage for the modified building will be consistent with existing signage in that it will be internally illuminated instead of floodlit, and will not include neon lighting. All signage design and lighting will be subject to the Williamson Ranch Plaza Sign Criteria, as previously approved by the City, and will not introduce new sources of intense light or glare to the site or surrounding properties.

It is important to note that the parking lot lighting is left on overnight under current conditions and will continue to be left on after the expansion. However, the reduced intensity of lighting, along with the much shorter pole heights, and shielding to prevent direct off-site illumination, will result in a substantial reduction of illumination to residential properties in the vicinity, compared to current conditions. As such, the impact of project lighting upon off-site receptors will be *less than significant*.

All aspects of project planning and design, including the detailed plans for lighting and landscaping, will be subject to design review. This review and approval process will ensure that design of project lighting will reflect a balance between the provision of sufficient light for on-site safety and the avoidance of excessive light which could adversely affect neighboring properties. Additionally, this review will ensure implementation of the zoning ordinance requirement that no direct illumination occur beyond the project boundaries.

With the number of vehicles that would park and circulate through the Walmart site, there is a potential for daytime glare from reflected sunlight off car windshields. There is also a potential for nighttime intrusion of headlight glare from vehicles parked or circulating near the project boundaries. These effects will be avoided along the northern site boundary by the continuous 8-foot high masonry screen wall to be constructed along the northern edge of the expansion area. Along the southern and western site boundaries, these effects are currently minimized through the existing perimeter landscaping along the street frontages.

In summary, the design features proposed for the project would avoid direct illumination of adjacent properties and minimize the potential for glare. Therefore, the potential lighting and glare impacts associated with the project would be *less-than-significant*.

Mitigation. No mitigation required.

Cumulative Impacts

Impact A3. Cumulative Aesthetic Impacts. The project and the other cumulative projects would result in changes to the visual character of their setting; however, these visual changes would not represent a cumulatively significant adverse visual impact. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Aesthetic Impacts

Aesthetic impacts associated with urban development tend to be highly localized and generally extend a short distance beyond project boundaries, at most, particularly for the relatively low profile development proposed. Thus aesthetic impacts at several project sites in the same general vicinity would not accumulate to result in a greater level of impact, particularly in a setting that is largely urbanized. Given the relatively level terrain of the project vicinity, the maximum distance visible by observers situated within view of the project is about one-half mile (the farthest residences on the ridge to the south of Lone Tree Way are approximately one-half mile from the project site). Therefore, although it is unlikely that aesthetic impacts would extend beyond the immediate project vicinity, to be conservative for purposes of this EIR, the geographic scope of the cumulative analysis of aesthetic impacts is considered to extend approximately one-half mile beyond the project site. There are two approved projects within this radius – the final phase of the Lone Tree Landing commercial project to the east across Hillcrest Avenue, and the final phase of the Williamson Ranch Plaza to the west.

Cumulative Impact Analysis

Development of the cumulative projects would result in minor visual changes to the settings of their respective sites. The two cumulative projects, both of which would be about 20,000 square feet, comprise the final phases of larger projects which are otherwise built out (with the exception of the subject Walmart expansion area), and the surrounding area is urbanized. There are no recognized scenic resources in the area that would be adversely affected by the proposed project or the cumulative projects. These approved developments were subject to City policies, ordinances, and guidelines requiring their visual impacts be minimized, and that unnecessary light and glare be avoided, and were both subject to the City's design review process (see 'Regulatory Setting' above). This also applies to all other cumulative projects in the area which would be subject to the same design requirements (or similar requirements in the case of projects located in Brentwood and Oakley). Therefore, the combined visual effects associated with development of the cumulative projects would be *less-than-significant*.

Mitigation. No mitigation required.

REFERENCES/BIBLIOGRAPHY

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B. AIR QUALITY

The air quality analysis in the previous IS/MND was based on an air quality report prepared in March 1998. In the intervening years, there have been significant changes in air quality regulations and standards, and substantial refinements have been made to impact assessment methodologies and computer dispersion modeling. In addition, ongoing air quality monitoring has been undertaken in the intervening years, resulting in the availability of more current data on ambient air quality conditions. As such, much of the information and analysis contained in the previous air quality report and IS/MND is no longer current and needs to be updated in this EIR. To provide the updated analysis, a new Air Quality Impact Analysis was prepared for this EIR by Illingworth & Rodkin in October 2009, which is incorporated into this EIR by reference, as provided under CEQA Guidelines Section 15150. The air quality report is contained in Appendix C of this EIR, and its findings are summarized below.

ENVIRONMENTAL AND REGULATORY SETTING

The ambient air quality in a given area depends on the quantities of pollutants emitted within the area, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, as well as the surrounding topography of the air basin. Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). The significance of a pollutant concentration is determined by comparing the concentration to an appropriate ambient air quality standard. The standards represent the allowable pollutant concentrations designed to ensure that the public health and welfare are protected, while including a reasonable margin of safety to protect the more sensitive individuals in the population.

Climate and Topography

The project is located in Antioch, in the northeastern portion of Contra Costa County. The proximity of this location to the Pacific Ocean, San Francisco Bay, and the Delta has a moderating influence on the climate. Prevailing winds are from the west in the Carquinez Straits, particularly during the summer. During late spring, summer and early fall months, high pressure offshore, coupled with thermal low pressure in the Central Valley, affected by high inland temperatures, sets up a pressure pattern that draws marine air eastward through the Carquinez Straits almost every day. The wind is strongest in the afternoon, because that is when the pressure gradient between the semi-permanent high pressure offshore and the thermal low in the Central Valley is greatest. Afternoon wind speeds of 15 to 20 mph are common throughout the Carquinez Straits region, with gusty winds. Sometimes the pressure gradient reverses and flow from the east occurs. In the summer and fall months, this can cause elevated pollutant levels in the Bay Area. Typically, for this to occur, an area of high pressure is centered inland over the Great Basin or the Pacific Northwest. This displaces the thermal low to the west, setting up an east to west or northeast to southwest wind flow (an offshore flow event). These relatively infrequent offshore events have low wind speeds and shallow mixing depths, thereby allowing the localized emissions to build up. Furthermore, the air mass from the east is warmer, thereby increasing photochemical activity, and contains more pollutants than the usual maritime air blowing from the west. During the winter, easterly flow through the Carquinez Strait is more common. When migrating storm systems are not affecting California, inland high-pressure systems tend to be stronger than the high-pressure systems over the eastern Pacific Ocean. This results in an easterly flow of cool interior air from the Central Valley into the Bay Area through the Carquinez Strait.

Air quality standards for ozone traditionally are exceeded when relatively stagnant conditions in the region occur for periods of several days during the warmer months of the year. Weak wind flow patterns combined with strong inversions substantially reduces normal atmospheric mixing. Key components of ground-level ozone formation are sunlight and heat; therefore, significant ozone formation only occurs during the months from late spring through early fall. Prevailing winds during the summer and fall can transport and trap ozone precursors from the more urbanized portions of the Bay Area. The meteorological factors make air pollution potential in the project area quite high at times in summer are the persistent clear skies with relatively warm conditions that combine with transported and localized air pollutant emissions to elevate ozone levels. However, Antioch's proximity to the Carquinez Straits tends to result in more atmospheric mixing due to stronger winds and less stable atmospheric conditions. The strong typical winds in the Antioch area tend to transport localized emissions into the Central Valley and San Joaquin Valley air basins.

OVERALL REGULATORY SETTING

The Federal Clean Air Act governs air quality in the United States. In addition to being subject to Federal requirements, air quality in California is also governed by more stringent regulations under the California Clean Air Act. At the Federal level, the United States Environmental Protection Agency (U.S. EPA) administers the Federal Clean Air Act. The California Clean Air Act is administered by the California Air Resources Board (CARB) at the State level and by the Air Quality Management Districts at the regional and local levels. The Bay Area Air Quality Management District (BAAQMD) regulates air quality at the regional level, which includes the nine-county Bay Area.

United States Environmental Protection Agency

The US EPA is responsible for enforcing the Federal CAA. The US EPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). NAAQS are required under the 1977 Clean Air Act and subsequent amendments. The US EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. The agency has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by CARB.

California Air Resources Board

In California, CARB (which is part of the California Environmental Protection Agency), is responsible for meeting the state responsibilities under the Federal Clean Air Act, administering the California Clean Air Act, and establishing the California Ambient Air Quality Standards (CAAQS). The California Clean Air Act requires all air districts in the State to endeavor to achieve and maintain CAAQS. CARB regulates mobile air pollution sources, such as motor vehicles. The agency is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB has established passenger vehicle fuel specifications and oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level. CARB also conducts or supports research into the effects of air pollution on the public and develops innovative approaches to reducing air pollutant emissions.

Bay Area Air Quality Management District

BAAQMD is primarily responsible for assuring that the National and State ambient air quality standards are attained and maintained in the Bay Area. BAAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, conducting public education campaigns, as well as many other activities. BAAQMD has jurisdiction over much of the nine-county Bay Area counties.

National and State Ambient Air Quality Standards

As required by the Federal Clean Air Act, NAAQS have been established for six major air pollutants: carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O₃), respirable particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), sulfur oxides, and lead. Pursuant to the California Clean Air Act, the State of California has also established ambient air quality standards. These standards are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. Both State and Federal standards are summarized in Table 3 on the next page. The “primary” standards have been established to protect the public health. The “secondary” standards are intended to protect the nation’s welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation and other aspects of the general welfare. Since the CAAQS are more stringent than NAAQS, the CAAQS are used as the comparative standard in this analysis.

Criteria Air Pollutants and Their Health Effects

Air quality studies generally focus on five pollutants that are most commonly measured and regulated. These are referred to as “criteria air pollutants,” and include carbon monoxide (CO), ground level ozone (O₃), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and suspended particulate matter, i.e., PM₁₀ and PM_{2.5}. In Contra Costa County, ozone and particulate matter are the pollutants of greatest concern since measured air pollutant levels exceed these concentrations at times.

Carbon Monoxide. CO, a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue, and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. Automobile exhaust and residential wood burning in fireplaces and woodstoves emit most of the CO in the Bay Area. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. The highest CO concentrations measured in the Bay Area are typically recorded during the winter.

TABLE 3
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	National Standards ^(a)	
			Primary ^(b,c)	Secondary ^(b,d)
Ozone	8-hour	0.070 ppm	0.075 ppm	—
	1-hour	0.09 ppm	— ^e	Same as primary
Carbon monoxide	8-hour	9.0 ppm	9 ppm	—
	1-hour	20 ppm	35 ppm	—
Nitrogen dioxide	Annual	0.03 ppm	0.053 ppm	Same as primary
	1-hour	0.18 ppm	0.030 ppm	—
Sulfur dioxide	Annual	—	0.03 ppm	—
	24-hour	0.04 ppm	0.14 ppm	—
	3-hour	—	—	0.5 ppm
	1-hour	0.25 ppm	—	—
PM ₁₀	Annual	20 µg/m ³	-- ^f	Same as primary
	24-hour	50 µg/m ³	150 µg/m ³	Same as primary
PM _{2.5}	Annual	12 µg/m ³	15 µg/m ³	
	24-hour	—	35 µg/m ³ ^f	
Lead	Calendar quarter	—	1.5 µg/m ³	Same as primary
	30-day average	1.5 µg/m ³	—	—

Notes: (a) Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
(b) Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.
(c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the EPA.
(d) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
(e) The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005. A new 8-hour standard was established in May 2008.
(f) The annual PM₁₀ standard was revoked by U.S. EPA on September 21, 2006 and a new PM_{2.5} 24-hour standard was established.

Source: Illingworth & Rodkin

Ozone. O₃, a colorless toxic gas, is the chief component of urban smog. While O₃ serves a beneficial purpose in the upper atmosphere (stratosphere) by reducing ultraviolet radiation potentially harmful to humans, when it reaches elevated concentrations in the lower atmosphere it can be harmful to the human respiratory system and to sensitive species of plants. O₃ enters the blood stream and interferes with the transfer of oxygen, depriving sensitive tissues in the heart and brain of oxygen. Short-term O₃ exposure can reduce lung function in children, make persons susceptible to respiratory infection, and produce symptoms that cause people to seek medical treatment for respiratory distress. Long-term exposure can impair lung defense mechanisms and lead to emphysema and chronic bronchitis. Sensitivity to O₃ varies among individuals, but about 20 percent of the population is sensitive to O₃, with exercising children being particularly vulnerable. O₃ also damages vegetation by inhibiting growth. O₃ is formed in the atmosphere by a complex series of photochemical reactions that involve “ozone precursors” that are two families of pollutants: oxides of nitrogen (NO_x) and reactive organic gases (ROG). NO_x and ROG are emitted from a variety of stationary and mobile sources. While NO₂, an oxide of nitrogen, is another criteria pollutant itself, ROGs are not in that category, but are included in this discussion as O₃ precursors. O₃ concentrations build to peak levels during periods of light winds, bright sunshine, and high temperatures. O₃ is present in relatively high concentrations within portions of the Bay Area on some days during late spring, summer and early autumn. Days with low wind speeds or stagnant air, warm temperatures, and cloudless skies are most likely to have high O₃ concentrations.

Nitrogen Dioxide. NO₂, a reddish-brown gas, irritates the lungs. It can cause breathing difficulties at high concentrations. Exposures to unhealthy levels of NO₂ can lead to acute and chronic respiratory disease. Like O₃, NO₂ is not directly emitted, but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO₂ are collectively referred to as NO_x and are major contributors to O₃ formation. NO₂ also contributes to the formation of PM₁₀ (see discussion of PM₁₀ below). Levels of NO₂ in the Bay Area are relatively low.

Sulfur Oxides. Sulfur oxides, primarily SO₂, are a product of high-sulfur fuel combustion. The main sources of SO₂ are coal and oil used in power stations, in industries, and for domestic heating. Industrial chemical manufacturing is another source of SO₂. SO₂ is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. Although there are refineries up wind of Antioch, SO₂ is found at low concentrations in eastern Contra Costa County.

PM₁₀ and PM_{2.5}: Respirable particulate matter, PM₁₀, and fine particulate matter, PM_{2.5}, consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM₁₀ and PM_{2.5} represent fractions of particulate matter that can be inhaled and cause adverse health effects. PM₁₀ and PM_{2.5} are a health concern, particularly at levels above the Federal and State ambient air quality standards. PM_{2.5} (including diesel exhaust particles) is considered to have greater effects on health because minute particles are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Children are more susceptible to the health risks of PM_{2.5} because their immune and respiratory systems are still developing. Very small particles of certain substances (e.g., sulfates and nitrates) can also directly cause lung damage or can contain absorbed gases (e.g., chlorides or ammonium) that may be injurious to health.

Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of

particulate matter, such as mining and demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. In addition to being directly emitted, PM_{2.5} is formed in the atmosphere from gases such as SO₂, NO_x, and volatile organic compounds (VOCs) that react to form aerosols. In addition to health effects, particulates also can damage materials and reduce visibility. Dust comprised of large particles (diameter greater than 10 microns) settles out rapidly and is more easily filtered by human breathing passages. This type of dust is considered more of a soiling nuisance rather than a health hazard.

In 1983, CARB replaced the standard for “suspended particulate matter” with a standard for suspended PM₁₀ or “respirable particulate matter.” This standard was set at 50 µg/m³ for a 24-hour average and 30 µg/m³ for an annual average. CARB revised the annual PM₁₀ standard in 2002, pursuant to the Children’s Environmental Health Protection Act. The revised PM₁₀ standard is 20 µg/m³ for an annual average. PM_{2.5} standards were first promulgated by the EPA in 1997 and were revised in late 2006 to lower the PM_{2.5} standard to 35 µg/m³ for 24-hour exposures. That same action by EPA revoked the annual PM₁₀ standard due to lack of scientific evidence correlating long-term exposures of ambient PM₁₀ with health effects. CARB has only adopted an annual average PM_{2.5} standard, which is set at 12 µg/m³. This is more stringent than the NAAQS of 15 µg/m³.

Toxic Air Contaminants (TAC)

Besides the “criteria” air pollutants, there is another group of substances found in ambient air referred to as Hazardous Air Pollutants (HAPs) under the Federal Clean Air Act and Toxic Air Contaminants (TACs) under the California Clean Air Act. These contaminants tend to be localized and are found in relatively low concentrations in ambient air. However, they can result in adverse chronic health effects if exposure to low concentrations occurs over long periods. They are regulated at the local, State, and Federal level.

HAPs are the air contaminants identified by U.S. EPA as known or suspected to cause cancer, serious illness, birth defects, or death. Many of these contaminants originate from human activities, such as fuel combustion and solvent use. Mobile source air toxics (MSATs) are a subset of the 188 HAPs. Of the 21 HAPs identified by EPA as MSATs, priority lists of six HAPs were identified that include: diesel exhaust, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. While vehicle miles traveled in the United States is expected to increase by 64 percent over the period 2000 to 2020, emissions of MSATs are anticipated to decrease substantially as a result of efforts to control mobile source emissions (by 57 percent to 67 percent depending on the contaminant).

CARB reports that recent air pollution studies have shown an association that diesel exhaust and other cancer-causing toxic air contaminants emitted from vehicles are responsible for much of the overall cancer risk from TACs in California. Particulate matter emitted from diesel-fueled engines (diesel particulate matter [DPM]) was found to comprise much of that risk. In August 1998, CARB formally identified DPM as a TAC. Diesel particulate matter is of particular concern since it can be distributed over large regions, thus leading to widespread public exposure. The particles emitted by diesel engines are coated with chemicals, many of which have been identified by EPA as HAPs, and by CARB as TACs. Diesel engines emit particulate matter at a rate about 20 times greater than comparable gasoline engines.

The vast majority of diesel exhaust particles (over 90 percent) consist of PM_{2.5}, which are particles that can be inhaled deep into the lung. Like other particles of this size, a portion will eventually become trapped within the lung possibly leading to adverse health effects. While the gaseous portion of diesel

exhaust also contains TACs, CARB's 1998 action was specific to DPM, which accounts for much of the cancer-causing potential from diesel exhaust. California has adopted a comprehensive diesel risk reduction program to reduce 2000 DPM emissions 85 percent by 2020. The U.S. EPA and CARB adopted low sulfur diesel fuel standards in 2006 that reduce diesel particulate matter substantially.

Exposure to TACs is usually evaluated in terms of health risk or cancer risk. For cancer health effects, the risk is expressed as the number of chances in a population of a million people who might be expected to get cancer over a 70-year lifetime. CARB estimates 2001 lifetime cancer risk at about 100 to 250 excess cases per million people in Antioch.

Ambient Air Quality

The BAAQMD monitors air quality conditions at over 30 locations throughout the Bay Area. The Pittsburg air monitoring station is the nearest station to Antioch, and thus is the most representative of air quality conditions at the project area. Criteria pollutants monitored include O₃, CO, NO₂, and PM₁₀. PM_{2.5} is not measured at this site. A summary of the data recorded at this station is shown in Table 4 for the period 2003 through 2007.

Table 5 shows the number of days per year that air pollutant levels exceeded national or State standards in Pittsburg and the entire Bay Area monitoring network. The NAAQS for O₃ (8-hour concentrations) was exceeded once in 2006. No other exceedances of the NAAQS for O₃ have occurred at this station. The 1-hour CAAQS for O₃ was exceeded on 3 days in 2006 during a heat wave and one day in 2007. Exceedances of that standard did not occur in 2003 through 2005. The new State 8-hour O₃ standard was exceeded on 2 days in 2005, 10 days in 2006 and 2 days in 2007. Measured concentrations of CO and NO₂ did not exceed the NAAQS or CAAQS. Measured exceedances of the 24-hour PM₁₀ State standard occurred on 1 to 4 sampling days annually during the 5-year period. PM_{2.5} is not measured at this station.

Data from all stations throughout the Bay Area indicate that the 1-hour NAAQS for O₃ concentrations (recently revoked) was exceeded on 1 day in 2003. The 8-hour NAAQS for O₃ was exceeded 0 to 12 days annually. The more stringent State 1-hour O₃ standard was exceeded on 4 to 19 days annually and the new State 8-hour standard was exceeded on 9 to 22 days annually. The State PM₁₀ standard was exceeded on 3 to 15 sampling days annually. The new 2006 PM_{2.5} national standard was exceeded on 1 day in 2004, 10 days in 2006, and 14 days in 2007.

TABLE 4
HIGHEST MEASURED AIR POLLUTANT CONCENTRATIONS

Pollutant	Average Time	Standards		Measured Air Pollutant Levels				
		State	National	2003	2004	2005	2006	2007
Pittsburg								
Ozone (O ₃)	1-Hour	0.070 ppm	0.075 ppm	0.09 ppm	0.09ppm	0.09 ppm	0.11 ppm	0.10 ppm
	8-Hour	0.09 ppm	— ^e	0.08 ppm	0.08 ppm	0.08 ppm	0.09 ppm	0.07 ppm
Carbon Monoxide (CO)	8-Hour	9.0 ppm	9 ppm	1.7 ppm	1.9 ppm	1.7 ppm	1.9 ppm	1.5 ppm
Nitrogen Dioxide (NO ₂)	1-Hour	20 ppm	35 ppm	0.06 ppm	0.05 ppm	0.06 ppm	0.05 ppm	0.05 ppm
	Annual	0.03 ppm	0.053 ppm	0.01 ppm	0.01 ppm	0.01 ppm	0.01 ppm	0.01 ppm
Fine Particulate Matter (PM ₁₀)	24-Hour	20 µg/m ³	— ^f	58 µg/m³	64 µg/m³	57 µg/m³	59 µg/m³	59 µg/m³
	Annual	50 µg/m ³	150 µg/m ³	NA	22 µg/m ³	NA	20 µg/m ³	19 µg/m ³
Respirable Particulate Matter (PM _{2.5})	24-Hour	12 µg/m ³	15 µg/m ³	NA	NA	NA	NA	NA
	Annual	—	35 µg/m ^{3f}	NA	NA	NA	NA	NA
Bay Area (Basin Summary)								
Ozone (O ₃)	1-Hour	0.070 ppm	0.075 ppm	0.12 ppm	0.11 ppm	0.12 ppm	0.12 ppm	0.12 ppm
	8-Hour	0.09 ppm	— ^e	0.10 ppm	0.08 ppm	0.09 ppm	0.11 ppm	0.09 ppm
Carbon Monoxide (CO)	8-Hour	9.0 ppm	9 ppm	4.0 ppm	3.4 ppm	3.1 ppm	2.9 ppm	2.7 ppm
Nitrogen Dioxide (NO ₂)	1-Hour	20 ppm	35 ppm	0.09 ppm	0.07 ppm	0.07 ppm	0.11 ppm	0.07 ppm
	Annual	0.03 ppm	0.053 ppm	0.021ppm	0.019ppm	0.019ppm	0.018ppm	0.017ppm
Respirable Particulate Matter (PM ₁₀)	1-Hour	20 µg/m ³	— ^f	60 ug/m³	65 ug/m³	81 ug/m³	73 ug/m³	78 ug/m³
	Annual	50 µg/m ³	150 µg/m ³	25 ug/m³	26 ug/m³	24 ug/m³	23 ug/m³	26 ug/m³
Fine Particulate Matter (PM _{2.5})	24-Hour	12 µg/m ³	15 µg/m ³	56 ug/m ³	52 ug/m ³	55 ug/m ³	75 ug/m³	58 ug/m³
	Annual	—	35 µg/m ^{3f}	12 ug/m ³	12 ug/m ³	12 ug/m ³	11 ug/m ³	11 ug/m ³

Source: BAAQMD Air Quality Summaries for 2003, 2004, 2005, 2006, and 2007.

Note: ppm = parts per million and ug/m³ = micrograms per cubic meter
 Values reported in **bold** exceed ambient air quality standard
 NA = data not available.

TABLE 5
ANNUAL NUMBER OF DAYS EXCEEDING AMBIENT AIR QUALITY STANDARDS

Pollutant	Standard	Monitoring Station	Days Exceeding Standard				
			2003	2004	2005	2006	2007
Ozone (O ₃)	NAAQS 1-hr	Pittsburg	0	0	- ¹	- ¹	- ¹
		BAY AREA	1	0	- ¹	- ¹	- ¹
	NAAQS 8-hr	Pittsburg	0	0	0	1	0
		BAY AREA	7	0	1	12	1
CAAQS 1-hr	Pittsburg	0	0	0	3	1	
	BAY AREA	19	7	9	18	4	
CAAQS 8-hr	Pittsburg	- ²	- ²	2	10	2	
	BAY AREA	- ²	- ²	9	22	9	
Respirable Particulate Matter (PM ₁₀)	NAAQS 24-hr	Pittsburg	0	0	0	0	0
		BAY AREA	0	0	0	0	0
CAAQS 24-hr	Pittsburg	1	1	1	2	4	
	BAY AREA	6	7	3	15	4	
Fine Particulate Matter (PM _{2.5})	NAAQS 24-hr ³	Pittsburg	NA	NA	NA	NA	NA
		BAY AREA	0	1	0	10	14
All Other (CO, NO ₂ , Lead, SO ₂)	All Other	Pittsburg	0	0	0	0	0
		BAY AREA	0	0	0	0	0

¹ Standard revoked in 2004.

² Standard not yet in place.

³ Based on standard of 65 µg/m³ that was in place until September 21, 2006, then 35 µg/m³ standard in 2006.

NA = data not available.

Source: Illingworth & Rodkin

Attainment Status and Regional Air Quality Planning

Attainment Status

Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. The Bay Area as a whole does not meet either CAAQS or NAAQS for ground level O₃, or CAAQS for particulate matter (both PM₁₀ and PM_{2.5}). For O₃, the entire Bay Area is designated as non-attainment at both the federal and State levels.

Under the federal CAA, the EPA has designated the region as marginally non-attainment for the 8-hour O₃ standard. EPA recently revised the standard slightly and will be making new attainment designations for this standard in about three years. Although EPA has determined that monitoring data for the Bay Area indicate attainment of the previous, but slightly higher standard, CARB and BAAQMD have not requested a change in the designation.

The U.S. EPA lowered the 24-hour PM_{2.5} standard from 65 µg/m³ to 35 µg/m³ in 2006. The EPA issued attainment status designations for the 35 µg/m³ standard on December 22, 2008. The final EPA order formally designating the Bay Area as nonattainment with the federal PM_{2.5} standard will be effective in April 2009. The nonattainment designation is based on violations of the standard at air monitoring stations in Vallejo and San Jose. The BAAQMD will have until April 2012 to develop a plan for meeting the standard and will have until April 2014 to achieve compliance with the standard.

The Bay Area has met the CO standards for over a decade and is classified attainment maintenance by the US EPA. The US EPA grades the region as unclassified for all other air pollutants, including PM₁₀.

At the State level, the region is considered serious non-attainment for the 1-hour and 8-hour O₃ and non-attainment for PM₁₀ and PM_{2.5}. The region is required to adopt plans on a triennial basis that show progress toward meeting the State O₃ standard. There are no formal planning requirements for meeting the State PM_{2.5} or PM₁₀ standards. The area is considered attainment or unclassified for all other pollutants.

Bay Area Clean Air Plan

BAAQMD along with the other regional agencies (i.e., ABAG and MTC) has prepared an Ozone Attainment Plan to address the 1-hour NAAQS for ozone. Although the US EPA revoked the 1-hour NAAQS, commitments made in that plan along with emissions budgets remain valid until the region develops an attainment demonstration/maintenance plan for the 8-hour NAAQS for ozone. To be redesignated as attainment/maintenance for the ozone NAAQS, the region will be required to submit a maintenance plan and demonstration of attainment with a request for redesignation to the EPA. A Carbon Monoxide Maintenance Plan was approved in 1998 by EPA, which demonstrated how NAAQS for carbon monoxide standard would be maintained.

Beginning in 1991, air quality plans addressing the California Clean Air Act were developed about every three years. The plans are meant to demonstrate progress toward meeting the more stringent 1-hour ozone CAAQS. The latest Clean Air Plan, which was adopted in January 2006, is called the *Bay Area 2005 Ozone Strategy*. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources. The plan objective is to indicate how the region would make progress toward attaining the stricter state air quality standards, as mandated by the California Clean Air Act. The plan is designed to achieve a region-wide reduction of ozone precursor pollutants through the expeditious implementation of all feasible measures. The plan proposes expanded implementation of transportation control measures (TCMs) and programs such as Spare the Air. Spare the Air is a public outreach program designed to educate the public about air pollution in the Bay Area and promote individual behavior changes that improve air quality. Some of these measures or programs rely on local governments for implementation (e.g., BART offers free transit rides on Spare the Air days).

The clean air planning efforts for ozone will also reduce PM₁₀ and PM_{2.5}, since a substantial amount of this air pollutant comes from combustion emissions such as vehicle exhaust. In addition, BAAQMD adopts and enforces rules to reduce particulate matter emissions and develops public outreach programs to

educate the public to reduce PM₁₀ and PM_{2.5} emissions (e.g., Spare the Night Program). An update to the 1991 clean air plan (currently the *Bay Area 2005 Ozone Strategy*) is currently under development. This update is expected to be completed and adopted by the BAAQMD in late 2009. In addition to strategies to control ozone precursor emissions, the plan will address particulate matter and greenhouse gases.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following groups who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. Sensitive land uses near the project site include residential and park and recreational uses. The residential uses include the existing single-family homes north of the site and south of Lone Tree Way from the site. Park and recreational facilities in the immediate vicinity include: Knoll Park to the northwest of the site; Williamson Ranch Park on the opposite side of Lone Tree Way; and Prewett Family Park located just west of the Williamson Ranch Plaza. The nearest sensitive receptors are the residents of the dwellings along the north side of East Antioch Creek. As shown in Figures 3 and 5, these nearest residences are located approximately 100 feet from the north project site boundary.

City of Antioch General Plan

The Resource Management Element of the City of Antioch General Plan contains the following objective and policies related to air quality which are relevant to the project:

10.6.1 Air Quality Objective

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

10.6.2 Air Quality Policies

Construction Emissions

- 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

- 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:
 - 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.
- d. Support and facilitate employer-based trip reduction programs by recognizing such programs in environmental mitigation measures for traffic and air quality impacts where ongoing implementation can be ensured, and their effectiveness can be monitored.

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines, Appendix G, the project would be considered to have a significant impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people;

As provided under the State CEQA Guidelines, the CEQA Guidelines prepared by BAAQMD were applied to evaluate the significance of impacts resulting from the project. The following BAAQMD significance criteria are applied to provide greater specificity to several of the CEQA standards as contained in Appendix G.

- A substantial net increase of any criteria pollutant, which is defined by BAAQMD as direct or indirect emissions of greater than 80 pounds per day for ROG, NO_x, or PM₁₀. The BAAQMD CEQA Guidelines do not include thresholds for PM_{2.5}. The thresholds for PM₁₀ are considered to be inclusive of PM_{2.5}, since PM₁₀ particulates include PM_{2.5}.
- A substantial contribution to an existing or project violation of an ambient air quality standard would result if the project would cause an exceedance of the California Ambient Air Quality Standard for carbon monoxide of 9.0 parts per million over an 8-hour averaging period:
- Expose sensitive receptors or the general public to substantial pollutant concentrations. This is evaluated by assessing the health risk in terms of cancer risk or hazards posed by the placement of new sources of air pollutant emissions near existing sensitive receptors or placement of new sensitive receptors near existing sources. A significant impact would occur if the project results in probability of greater than 10 in one million that the Maximally Exposed Individual (MEI) will contract cancer.

- Create or expose a substantial number of people to objectionable odors.

The BAAQMD Guidelines recommend that cumulative impacts be evaluated based on the significance of operational air quality impacts and evaluation of the consistency of the project with the General Plan and of the General Plan with the Clean Air Plan.

The BAAQMD significance threshold for construction dust impacts is based on the appropriateness of construction dust controls. The BAAQMD guidelines provide feasible control measures for construction emission of PM₁₀. If the appropriate construction controls are implemented, then air pollutant emissions from construction activities are considered less-than-significant.

Correlation of Adverse Health Effects with Air Pollutant Emission Levels

Ozone, particulate matter and some constituents of ROG that are also TACs have been shown to be correlated with adverse health effects. For example, studies have shown that children who participated in several sports and lived in communities with high ozone levels were more likely to develop asthma than active children living in areas with less ozone pollution. Other studies have found a positive association between some volatile organic compounds and symptoms in asthmatic children. A large body of evidence has shown significant associations between measured levels of particulate matter outdoors and worsening of both asthma symptoms and acute and chronic bronchitis. It is not possible, however, to predict increases in severity of disease, hospital visits or deaths from respiratory diseases such as asthma, bronchitis or lung cancer based on estimated air pollutant emission levels, as discussed below.

It is not possible to estimate long-term concentrations of pollutants such as ozone, the TAC components of ROG or particulate matter (PM₁₀ and PM_{2.5}) resulting from an indirect source of air pollutants such as the project. Project-related emissions are primarily associated with vehicular exhaust generated by project traffic, and as such are not concentrated at the project site, but are spread over a large area. Forecasting changes in ozone levels, particulate matter or mobile-source TACs contained in ROG due to an individual project is not practical, given that ozone, mobile-source TACs and a portion of particulate matter are a result of a complex series of photochemical reactions in the atmosphere. Computer models of photochemical ozone/particulate matter formation capable of calculating a project-caused change in concentration described both spatially and temporally would require massive amounts of weather and emissions data. While such models do exist they are typically used in the development of regional air quality plans, and are not suitable for forecasting effects of an individual project. Even if data on spatially and temporally distributed project-related concentrations could be generated, information on dose-response relationships is lacking that would allow a quantitative analysis of health effects. While general correlations have been established between general pollutant concentrations as measured in urban environments and such factors as hospital visits or deaths from respiratory diseases such as asthma, bronchitis or lung cancer, direct causal relationships for individual pollutants have not been established. As such, the preparation of health risk assessments for these pollutants on a project-specific basis is neither practicable nor warranted.

However, in recognition of the general incremental health effects associated with these criteria pollutants, air quality management districts have established thresholds related to the volume of emissions for each pollutant which indicate the limits of acceptability in terms of effect on health. The exceedance of these established thresholds by a project is considered to represent a significant air quality impact, and a significant incremental health effect. The indirect emissions resulting from this project were evaluated through application of the thresholds of significance established by the BAAQMD, as set forth above.

IMPACTS AND MITIGATION

Project-Specific Impacts

Impact B1. Construction Emissions. Construction activities such as demolition, clearing, excavation and grading operations, construction vehicle traffic and wind blowing over exposed earth would generate fugitive dust emissions which would temporarily affect local air quality. (Significant Impact)

Construction within the project site would result in numerous activities which would generate fugitive particulate matter. Grading, earthmoving and excavation comprise the major source of construction dust emissions, but traffic and general disturbance of the soil also generate significant dust emissions. The amount of dust generated would be highly variable and is dependent on the size of the area disturbed, amount of activity, soil conditions and meteorological conditions. Most grading construction occurs during late spring through early fall when soil is dryer, which would result in the highest dust emissions. Typical winds during late spring through summer are from the west. Afternoon winds in late spring and summer can be quite gusty when soil conditions are dry. Nearby land uses include residential areas that could be adversely affected by dust generated from construction. In addition, construction dust emissions can contribute to regional PM₁₀ emissions.

Although grading and construction activities would be temporary, they would have the potential to cause both nuisance and health air quality impacts. PM₁₀ is the pollutant of greatest concern associated with dust. There are no significance thresholds that apply to temporary construction activities. The BAAQMD CEQA Guidelines recommend application of appropriate dust control measures to reduce PM₁₀ emissions from construction to avoid temporary significant impacts from construction. If uncontrolled, PM₁₀ levels downwind of actively disturbed areas could possibly exceed State standards. In addition, dust fall on adjacent properties could be a nuisance. If uncontrolled, dust generated by grading and construction activities represents a *significant* impact.

According to the *BAAQMD CEQA Guidelines*, emissions of ozone precursors (ROG and NO_x) and carbon monoxide related to construction equipment are already included in the emission inventory that is the basis for regional air quality plans, and thus are not expected to impede attainment or maintenance of ozone and carbon monoxide standards in the Bay Area.

During construction various diesel-powered vehicles and equipment in use on the site would create odors. These odors would be temporary and unlikely to be noticeable beyond the project boundaries.

Construction activities are also a source of organic gas emissions. Solvents in adhesives, non-waterbase paints, thinners, some insulating materials and caulking materials would evaporate into the atmosphere and would participate in the photochemical reaction that creates urban ozone. Asphalt used in paving is also a source of organic gases for a short time after its application. The overall air quality impact resulting from the project due to these sources is not considered significant.

Mitigation B1. Consistent with BAAQMD CEQA Guidelines, the following measures shall be required to be included in construction contracts and specifications for the expansion project.

Dust (PM₁₀) Control Measures:

- **Water all active construction areas at least twice daily and more often during windy periods; active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives;**
- **Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard;**
- **Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites;**
- **Sweep daily (preferably with water sweepers) all paved access roads, parking areas, and staging areas at construction sites; water sweepers shall vacuum up excess water to avoid runoff-related impacts to water quality;**
- **Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets;**
- **Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (i.e., previously-graded areas that are inactive for 10 days or more);**
- **Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.);**
- **Limit traffic speeds on unpaved roads to 15 mph;**
- **Install sandbags or other erosion control measures to prevent silt runoff to public roadways;**
- **Replant vegetation in disturbed areas as quickly as possible;**
- **Suspend construction activities that cause visible dust plumes to extend beyond the construction site.**

Measures to reduce diesel particulate matter and PM_{2.5} from construction

- **Diesel equipment standing idle for more than five minutes shall be turned off. This includes trucks waiting to deliver or receive soil, aggregate, or other bulk materials. Rotating drum concrete trucks may keep their engines running continuously as long as they were onsite. Signs describing idling restrictions shall be conspicuously posted at the construction site.**

- **Prohibit equipment with dirty emissions.** The project shall ensure that emissions from all off-road diesel powered equipment used on the project site do not exceed 40 percent opacity for more than three minutes in any one hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) shall be repaired immediately. This measure means that equipment with continuous dark emissions would be in violation of the requirement.
- **Properly tune and maintain equipment for low emissions.**
- **Use electrical power, rather than diesel powered generators.**

[Note: The above dust control measures are essentially the same as those identified in the 1998 IS/MND, with minor refinements. The measures to reduce diesel particulates and PM_{2.5} are newly identified in this document.]

Significance after Mitigation: Less-than-Significant Impact.

Impact B2. Ozone Precursors and Particulate Matter. Emissions from the project would result in the criteria pollutants ROG, NO_x, and PM; however, the net new emissions from the project would not exceed the BAAQMD thresholds of significance, and therefore represent a less-than-significant impact. (Less-than-Significant Impact)

The Bay Area is considered a non-attainment area for ground-level ozone under both the Federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for respirable particulates or particulate matter with a diameter of less than 10 micrometers (PM₁₀), and fine particulate matter with a diameter of less than 2.5 micrometers (PM_{2.5}) under the California Clean Air Act, but not the Federal Act. The area has attained both State and Federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone and PM₁₀, BAAQMD has established thresholds of significance for air pollutants. These thresholds are for ozone precursor pollutants ROG (reactive organic gases or hydrocarbons) and NO_x (nitrogen oxides), and PM₁₀. The thresholds of significance for ozone precursors and PM₁₀ are 80 pounds per day. (Although BAAQMD has not established a significance threshold for PM_{2.5}, it is important to note that PM_{2.5} is a component of PM₁₀. Illingworth & Rodkin's air quality modeling indicated that PM_{2.5} emissions would be about 20 percent of the PM₁₀ emissions which are well below the BAAQMD significance thresholds, as shown in Table 6.)

Project-related emissions are generated by vehicle trips associated with the project as well as emissions from area sources associated with project operations. Emissions associated with project traffic and area sources were calculated using the URBEMIS2007 emission model. The daily increase in emissions generated by the planned expansion is shown in Table 6. As shown in Table 6, project-related emissions of these pollutants would not exceed the applicable thresholds of significance; therefore, the proposed project expansion would have a *less-than-significant* effect on regional air quality. Thus, while the project-related emissions of ozone precursors and particulates may result in a

small decrease in overall air quality, and may therefore have a small adverse health affect (as described earlier in this section under “Criteria Air Pollutants and Their Health Effects”), the overall health impact would not be significant.

TABLE 6
PROJECT EMISSIONS OF CRITERIA POLLUTANTS (POUNDS PER DAY)

	Reactive Organic Gases (ROG)	Nitrogen Oxides (NOx)	Particulate Matter (PM ₁₀)	Fine Particulates (PM _{2.5})
Net New Mobile Sources	9	12	10	2
Net New Area Sources	<1	<1	<1	<1
Net New Sources - Total	10	13	10	2
BAAQMD Significance Thresholds:	80	80	80	-- ¹

¹ The BAAQMD does not have PM2.5-based standards.

Source: Illingworth & Rodkin

It is noted that the 1998 IS/MND includes the following mitigation measure for these criteria pollutants:

“The shopping center should include physical improvements such as sidewalk improvements, landscaping and bicycle parking that would act as incentives for pedestrian and bicycle and transit modes of travel.”

These improvements have been incorporated into the existing Walmart center, and will also be included in the planned project expansion, as required by City of Antioch policies and regulations.

Mitigation. No mitigation required.

Impact B3. Carbon Monoxide Emissions. Traffic generated by the expansion project would increase carbon monoxide emissions at local roadways and intersections; however, the resulting carbon monoxide concentrations would not exceed applicable regulatory thresholds. (Less-than-Significant Impact)

Carbon monoxide emissions from traffic generated by the project would be the greatest pollutant concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of carbon monoxide. Measured carbon monoxide levels have been at healthy levels (i.e., below

State and Federal standards) in the Bay Area since the early 1990s. As a result, the region has been designated as attainment for the standard. Highest measured 8-hour carbon monoxide levels over the last 3 years are 1.9 ppm in Pittsburg (well below the federal and State standard of 9.0 ppm).

Carbon monoxide concentrations have been predicted for the intersections considered the worst intersections (in terms of elevated carbon monoxide levels from traffic) that may be affected by project-generated traffic. The EMFAC2007 screening model was employed to predict maximum 8-hour concentrations near these intersections assuming worst-case meteorological conditions.

The analysis showed that the applicable State and federal CO standards are not exceeded under existing conditions, and that the proposed expansion project would not result in any new exceedances of the CO standards at any intersections affected by project traffic. The highest 8-hour concentration with the project in place is predicted to be 6.9 ppm over an 8-hour averaging period, well below the applicable federal and State standard of 9.0 ppm. (See the air quality report in Appendix C for the detailed CO modeling results.) The intersection with the highest projected levels of CO in 2010 is at Lone Tree Way and the Route 4 Bypass, where CO levels are affected by Bypass traffic and the project contribution would not be measurable. Lower concentrations would occur at other intersections affected by project traffic, and in each instance the project would result in a slight increase in carbon monoxide levels at those other intersections.

Since project traffic would not cause any new violations of the applicable State or federal standards for carbon monoxide, nor contribute substantially to an existing or projected violation, the project would result in a *less-than-significant* impact on local carbon monoxide concentrations. Thus, while the project-related emissions of carbon monoxide may result in a small decrease in overall air quality, and may therefore have a small adverse health affect (as described earlier in this section under “Criteria Air Pollutants and Their Health Effects”), the overall health impact would not be significant.

Mitigation. No mitigation required.

Impact B4: **Exposure of Sensitive Receptors to Toxic Air Contaminants.** Construction activity, delivery trucks, and customer traffic would expose nearby receptors to diesel particulate matter (DPM), a toxic air contaminant. A screening health risk assessment to assess the cancer risk from these emissions found the cancer risk to be below the BAAQMD significance threshold. (Less-than-Significant Impact)

Diesel particulate matter (DPM) would be emitted from diesel-fueled vehicles and equipment during construction activities as well as customer and employee vehicle travel attracted by the proposed project while operational. The particulate matter component of diesel exhaust has been classified as a TAC by CARB based on its potential to cause cancer and other adverse health effects. A health risk evaluation was conducted to assess the potential health effects of the proposed project’s DPM emissions on nearby sensitive receptors.

Additionally, polycyclic aromatic hydrocarbons (PAHs) would be emitted in small quantities from the one fast-food restaurant (McDonalds) at the project. PAHs are a group of over 100 chemicals and can be produced from cooking meat with charbroilers or griddles. PAHs are also classified as a TAC with the potential to cause cancer. Since the fast-food restaurant in the project involves the relocation of the existing fast-food restaurant within a remodeled portion of the existing store, it is not expected that there would be a net increase in PAH emissions associated with the project. Therefore, the health risk assessment for the project expansion did not include an assessment of PAH emissions.

A detailed description of each of these TAC sources is provided in the following paragraphs. The results of the emissions calculations are summarized in Table 7 below. Details on the health risk analysis methodology, DPM emission factors used, and emission calculations are provided in the air quality report in Appendix C.

Construction and Operational Diesel Emissions

The highest daily levels of DPM would be emitted during construction activities due to use of heavy-duty diesel equipment such as bulldozers, excavators, loaders, graders and diesel-fueled haul trucks. However, these emissions would be intermittent, would vary throughout the project site area, and would be of a relatively short duration (less than six months of heavy construction activity). In contrast, low-level DPM emissions would result from project operation but they would be constant over the lifetime of the project. Retail-related operational DPM emissions would result from large diesel-fueled trucks making merchandise and grocery deliveries to the proposed project, in addition to DPM emissions from a small fraction of customer motor vehicles that would be diesel fueled. DPM emissions from retail operation are assumed to occur continually over a 70-year exposure period.

Delivery Truck Diesel Emissions

DPM emissions from project-related delivery trucks will occur at the project site while they are driving through the site to make deliveries, during idling when not moving or unloading, and from operation of truck transportation refrigeration units (TRUs) on trucks carrying perishable products. For purposes of this analysis, it is assumed that there will be an average of up to about 22 delivery trucks accessing the expanded Walmart on a daily basis compared with up to about 15 trucks per day for the existing Walmart store. Of the 22 truck deliveries anticipated, 10 are assumed to be heavy duty 4-axle trucks, with 2 of these trucks equipped with TRUs, and 12 are assumed to be lighter duty 2-axle trucks. The existing store receives deliveries from up to about 8 heavy duty 4-axle trucks and 7 light duty 2-axle trucks daily. All of these trucks are assumed to be diesel-fueled. (Note: The increased delivery truck numbers are slightly higher than those indicated in the project description in order to present a worst-case analysis.)

Passenger Vehicle Diesel Emissions

Some of the project-generated trips by customers and employees would be from diesel-powered vehicles. Like delivery trucks, these would have emissions from both on-site

and travel to and from the site. Most of these trips would be light-duty automobiles or light-duty trucks and a small percentage would be considered medium-duty trucks.

Sensitive Receptors

As discussed above, the nearest residences are about 100 feet north of the project site opposite East Antioch Creek (see Figures 3 and 5). Other nearby residences are located along Hillcrest Avenue to the northeast of the site, and along Lone Tree Way to the south of the site. Commercial areas, with retail, professional offices, and restaurant uses, are located in Williamson Ranch Plaza directly west of the project site, and also east of the project site across Hillcrest Avenue.

The results of these emissions calculations are summarized in Table 7 below. The figures shown reflect exposure to DPM emissions from both project construction and operation. (Details on the health risk analysis methodology, DPM emission factors used, and emission calculations are provided in the air quality report in Appendix C.)

As shown in Table 7, the projected maximum increased cancer risks associated with combined DPM emissions from the various project sources are 0.07 per million for nearby residents, 1.89 per million for workers in the nearby retail commercial areas, and 0.88 per million for workers at the existing Walmart store. Since these projected maximum increased cancer risks are less than the BAAQMD significance threshold of 10 in one million, the project impact resulting from TACs would be considered *less than significant*.

TABLE 7

INCREASED CANCER RISKS FROM PROPOSED WALMART EXPANSION PROJECT

Store Condition	Maximum Increased Cancer Risk (per million persons)		
	Off-Site Worker Exposure	Existing (Walmart) Worker Exposure	Residential Exposure
Expanded Walmart Store ^a	2.85	2.04	2.25
Existing Walmart Store ^b	- 0.96	- 1.16	- 2.18
Net Increased Cancer Risk	1.89	0.88	0.07

^a Includes cancer risks from construction and operation. This includes the entire Walmart store, as proposed to be expanded.

^b Cancer risks from operation. Note: This line is subtracted from the first line to derive net change in cancer risks resulting from the store operation.

Source: Illingworth & Rodkin

As shown in Table 7, the project would result in a small potential increase in cancer risk, which would be equivalent to approximately 2 new cases per million persons. Thus, while the risk of any individual developing cancer as a result of exposure to project-related TAC emissions would increase slightly, this risk would be lower than the 10 cases

per million that is considered significant by the BAAQMD and the California Air Resources Board.

Mitigation: None Required

Impact B5. Odors. The fast-food restaurant in the project could release cooking exhausts which could result in noticeable odors beyond project boundaries. (Potentially Significant Impact)

During construction, the various diesel powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and not likely to be noticeable for extended periods of time much beyond the project boundaries. The potential for diesel odor impacts is therefore less than significant.

During project operations, the project could produce odors as a result of refuse storage and collection, and the operation of the tire and lube facility, and from cooking exhaust at the fast-food restaurant. The refuse storage and collection area will be expanded somewhat to accommodate increased solid waste generation by the expanded store, but all collection areas and containers will be enclosed to minimize generation of odors. The tire and lube facility, which will not be altered, does not generate noticeable odors beyond the project boundaries. Therefore, the odor impacts associated with refuse store and collection, and the tire and lube facility, would be *less than significant*.

The proposed project includes a fast-food restaurant, which is a potential source of odors. There is a fast-food restaurant in the existing store, and so the potential for odor impacts already exists. The project involves the relocation of the fast-food restaurant within a remodeled portion of the existing store. As a result, there is the potential for cooking odors to be released at a different location. Reaction to cooking odors varies widely with individuals. Some people find them objectionable, while others find them pleasant. Restaurant cooking odors have, in some instances, been the subject of complaints. However, no complaints have been received by the City of Antioch from the operation of the existing fast-food restaurant at the existing Antioch Walmart store. A potential for odor nuisance exists during light wind conditions. This is considered to be a potentially significant impact.

Mitigation B5. The fast-food restaurant in the project shall install kitchen exhaust vents in accordance with accepted engineering practice, and shall install exhaust filtration systems or other accepted methods of odor reduction.

[Note: This mitigation measure is newly identified in this EIR.]

The combination of dilution and odor removal through filtration would effectively reduce odor strength to undetectable levels.

Significance after Mitigation: Less-than-Significant Impact.

Impact B6. Consistency with Regional Air Quality Plan. The project would not conflict with the current clean air plan or obstruct its implementation. (Less-than-Significant Impact)

The project site has been planned for commercial retail use in successive general plans and specific plans dating back to 1982, and the proposed land use is consistent with the 2003 General Plan. The growth projections in the General Plan, which reflect the proposed project land use, would have been used in the growth projections contained in current air quality plan prepared by the Bay Area Air Quality Management District. Therefore, the project would not conflict with the latest clean air plan (i.e., *Bay Area 2005 Ozone Strategy*) or obstruct its implementation.

Mitigation. No mitigation required.

Cumulative Impacts

Impact B7: Cumulative Air Quality Impacts. Under cumulative conditions, the impacts of the cumulative projects in terms of localized air pollutants such as construction PM, carbon monoxide, and toxic air pollution would be less-than-significant. For regional criteria pollutants, the cumulative impacts would be significant. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Air Quality Impacts

Air quality impacts can be highly localized, as is the case for construction PM, carbon monoxide, and toxic air pollutant emissions; or the impacts can be regional in nature, as is the case for ozone precursors. Based on the characteristics of individual pollutants, described earlier in this section, the geographic scopes for the cumulative evaluation of each pollutant or group of pollutants are more specifically defined as follows: construction PM – localized to immediate project vicinity; carbon monoxide – confined to immediate vicinity of major intersections; operational PM and ozone precursors (ROG, NOx) – regional air basin; toxic air pollutants – within several hundred feet of project boundary. Projects which would contribute to cumulative impacts within these defined geographic study areas for each pollutant are considered in the cumulative analysis, except as noted.

Cumulative Impact Analysis

Local Air Pollutant Emissions

Localized air pollutants include PM₁₀ emissions during construction and CO emissions during project operation. With the implementation of BAAQMD's recommended dust control measures for PM₁₀ emissions, as set forth in Mitigation B1 above, construction period impacts would be less than significant. Additional PM₁₀ emissions from construction that may occur in the area simultaneously would be localized to the immediate area of those sites and would also be subject to BAAQMD's recommended

dust control measures, as specified in General Plan policy 10.6.2. Thus the cumulative construction PM₁₀ emissions from the cumulative projects would be less than significant.

The CO analysis was performed based on traffic data which incorporates the cumulative development projects in the base condition. Therefore, the results of the project-specific CO analysis, discussed in Impact B3 above, actually reflect cumulative CO levels. Since CO levels at the worst affected intersections are predicted to be well below the applicable federal and State standards, the cumulative CO emissions would be less-than-significant.

Regional Air Pollutant Emissions

The project itself would result in emissions that are below the BAAQMD CEQA Guidelines thresholds for ozone precursors and PM₁₀. According to the BAAQMD CEQA Guidelines, when a project does not individually result in significant operational air quality impacts, the determination of a significant cumulative impact is to be based on an evaluation of the consistency of the project with the local general plan and the consistency of the general plan with the regional air quality plan. As described under Impact B6, the project is consistent with the Antioch General Plan, which in turn is consistent with the regional Clean Air Plan, and therefore the project would not conflict with the regional Clean Air Plan. Therefore, the cumulative regional air quality impacts associated with the project are less than significant.

Toxic Air Pollutant Impacts

Potential cumulative toxic air pollutant impacts can result from interaction of the proposed Walmart expansion project with other approved or planned projects that could result in emissions of toxic air pollutants and would be operational within the timeframe of the proposed project. Two other projects, the Lone Tree Landing and Williamson Ranch Plaza projects (which both have been substantially completed but have undeveloped phases remaining), have been identified that have the potential to cumulatively interact with the proposed project. Other projects farther away were not considered since DPM emissions are highly localized and disperse quickly with distance from the source. Therefore, DPM emissions from other projects not in the immediate project vicinity would have negligible concentrations at the project site and would not combine with project emissions to result in a cumulatively significant health risk.

The Lone Tree Landing project is located across Hillcrest Avenue to the east of the Walmart site. The retail floor area approved for the final phase of this project is 25,000 square feet; plus there is completed but unoccupied 8,713 square feet of retail space and 9,595 square feet of office space, for a total approved but unoccupied area of 43,308 square feet. Once this project is occupied and operational, it expected to generate an average of about 3 daily 2-axle diesel truck deliveries, but no 4-axle truck deliveries or trucks with TRUs. The final phase of the other project, the Williamson Ranch Plaza - Phase IV, consists of 20,030 square feet of approved office development located at the western end of the same shopping center where Walmart is located. It is not expected that this development would have large diesel trucks (4-axle or 2-axle) making deliveries to its occupants on a regular basis.

The primary sources of diesel particulate matter emissions from retail and commercial developments are large diesel-fueled delivery trucks and trucks with TRUs. Because of the low level of truck activity that will be associated with the final phases of the Lone Tree Landing and the Williamson Ranch Plaza projects, these projects would not be considered to expose sensitive receptors to substantial levels of toxic air contaminants. Combined with the relatively low DPM emissions associated with the proposed project, the combined emissions from these proximate projects would also be relatively low and the health risk associated with these cumulative DPM emissions would not exceed the significance threshold of 10 increased cancer cases per 1 million population. Thus, cumulative exposure to toxic air pollutants from these nearby projects and the proposed Walmart expansion project would be *less than significant*.

Summary

The project would not contribute to a local cumulative air quality impact with respect to carbon monoxide or particulates, or in terms of health risk due to TAC exposure. In addition, the project is consistent with the Antioch General Plan, which in turn is consistent with the regional Clean Air Plan, and as such the project would not conflict with the regional Clean Air Plan; therefore, the project would not have a cumulatively significant impact on regional air quality. In conclusion, the project would not have a cumulatively significant impact on air quality.

Mitigation. No mitigation required.

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II. Environmental Setting, Impacts, and Mitigation Measures
B. Air Quality

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C. BIOLOGICAL RESOURCES

BACKGROUND DISCUSSION

The 1998 IS/MND discussion of biological resources was based on a biological report prepared by LSA. The biological report concluded that there were no special-status plants within the site, and that only one species of special-status wildlife, the western burrowing owl, had potential to occur on the site. Although no evidence of regular or long-term use of the project site by burrowing owls was found during LSA's site surveys, contingent mitigations were identified which were to be implemented in the event burrowing owls colonized the site prior to grading and construction for the project.

After the adoption of the IS/MND and approval of Phases 1 and 2 of the Williamson Ranch Plaza project in June 1998, burrowing owls did in fact colonize the site prior to site development. Subsequent discussions with the City of Antioch and the California Department of Fish and Game resulted in the execution of a Memorandum of Understanding (MOU) in February 1999 whereby the project applicant would provide mitigation for lost burrowing owl habitat in the form of off-site replacement acreage. The purchase of off-site habitat by the applicant was deemed to constitute full mitigation for loss of potential burrowing owl habitat on the entire 33-acre Williamson Ranch Plaza site, including the currently vacant 3.7-acre Walmart expansion area. (It is important to note that while the acquisition of off-site replacement acreage constitutes full mitigation for habitat loss, it does not permit "take" of individual owls, which is not mitigable and would constitute a violation of the California Endangered Species Act.)

In addition, the 1998 IS/MND identified the presence of 0.95 acres of wetland habitat on the larger development site. The wetland issues were resolved in conjunction with development of the previously constructed elements of the Williamson Ranch Plaza. Moreover, none of the identified wetland areas were located in the 3.7-acre planned Walmart expansion area.

Due to substantial changes in site conditions which have occurred since the IS/MND was adopted in 1998 (including development of most of the Williamson Ranch Plaza), as well as the potential for species composition on the site to change over short periods of time, the previous biological report by LSA is no longer considered valid documentation of biological conditions on the planned expansion site. As such, new biological surveys of the expansion site were conducted in conjunction with this EIR in order to reconfirm the findings of the previous biological evaluation and bring it up to date.

Accordingly, Live Oak Associates (LOA) conducted comprehensive biological site surveys in April 2005 and again in May 2008. The results of the field surveys, and the accompanying evaluation of project impacts and recommended mitigation measures, are presented in a report by LOA, dated August 2009, which is incorporated into this EIR by reference, as provided under CEQA Guidelines Section 15150. The LOA report is contained in Appendix D of this EIR and its findings and recommendations are summarized below.

ENVIRONMENTAL SETTING

Biotic Habitats

The Walmart expansion site consists entirely of ruderal non-native grassland habitat. The term "ruderal" refers to habitats that have been heavily disturbed by human factors. Ruderal habitats are characterized by being dominated by non-native grasses and forbs of European origin, and native vegetation is typically

sparse to non-existent. Non-native grass species observed on-site during the April 2005 and May 2008 surveys included slender wild oats, barnyard barley, ripgut brome, and Italian wild rye; while common non-native forbs included black mustard, hairy vetch, yellow star thistle, curly dock, and red-stemmed filaree. For the most part, the site consists almost entirely of herbaceous species; however, a few small trees and shrubs are present along the margins. There is a single immature willow along the southern boundary of the site. Landscape trees are also scattered immediately outside the project boundary, along the bank of East Antioch Creek. Species present in this area included a Fremont's cottonwood, weeping willow, and fruit tree.

Non-native grasslands can provide important habitat to many terrestrial vertebrates. As many as 25 species of reptiles and amphibians, 100 species of birds, and 50 species of mammals are known to use grassland habitats of central California. A number of these species are expected to utilize grasslands occurring on the site throughout all or part of the year as breeding and foraging habitat. However, due to the fact that the site is surrounded by existing development, the site's value as habitat for many wildlife species is greatly diminished. Nonetheless, some wildlife species were observed on-site during the April surveys, and still other species, not directly observed, would be expected to use this habitat year-round or seasonally.

The site provides only marginal habitat for locally occurring amphibian and reptile species. It is possible that individuals occurring in the adjacent habitat of East Antioch Creek could move onto the site from time to time. These species would include western toads, pacific treefrogs, western fence lizards, and gopher snakes.

Several species of resident and migratory bird species breed and forage in grassland habitats of Contra Costa County. A pair of burrowing owls was observed residing in an onsite burrow during the May 2008 survey. Other birds identified as foraging within or flying over the site during this survey include a number of house finches, mourning doves, American crows, barn swallow, and a northern mockingbird. A number of other songbird species would be expected to forage on the site; however, aside from the burrowing owls, the occurrence of raptor species would be limited due to the lack of trees of suitable size for breeding as well as the disturbed nature of the project site and its isolation from more suitable grassland habitat.

Several species of mammals were either observed in the grassland habitat of the site or would be expected to occur there from time to time. A fairly dense population of California ground squirrels was observed on-site during the April 2005 and May 2008 surveys. Other small mammals that are likely to occur on-site include the Botta's pocket gopher, western harvest mouse, California meadow vole, and black-tailed jackrabbit. Small mammals often attract predators, including the reptiles and birds previously discussed, as well as mammalian predators. Mammalian predators that are well adapted to human disturbance, such as Virginia opossum and raccoon, would be expected to forage for prey onsite. However, due to the site's urban surroundings, medium-sized predators such as the non-native red fox, coyote, and bobcat would be expected to occur on-site infrequently, if at all.

Movement Corridors

While no detailed study of animal movements has been conducted for the project area, knowledge of the site, its habitats, and the ecology of the species occurring on-site permits sufficient predictions about the types of movements occurring in the region.

The expansion site consists of ruderal non-native grassland habitat, which is surrounded by development and therefore isolated from naturally occurring biotic habitats. The adjacent channel of East Antioch Creek would constitute a minor movement corridor; however, this Creek would not be considered a significant movement corridor for any locally occurring wildlife. As such, the habitat of the site does not provide a major movement corridor between areas of natural habitat for most native species. Certain bird species may use this habitat for foraging during fall or spring migration, but aside from this, movements of native wildlife on the site would mainly be confined to those of resident animals moving within the site itself.

Special Status Communities and Species

Certain vegetation communities and plant and animal species are designated as having special-status based on their overall rarity, endangerment, restricted distribution, and/or unique habitat requirements. In general, a combination of these factors results in the designation of a species as sensitive. The Federal Endangered Species Act (FESA) outlines the procedures whereby species are listed as endangered or threatened and establishes a program for the conservation of such species and the habitats in which they occur. The California Endangered Species Act (CESA) amends the California Fish and Game Code to protect species deemed to be locally endangered and essentially expands the number of species protected under the FESA.

Special-Status Communities

The non-native grasslands which cover the entire expansion site have no special-status or protection. The adjacent channel of East Antioch Creek contains wetland and possibly riparian habitat, but the expansion site itself consists entirely of upland habitat. The project is not expected to affect the adjacent wetland habitat given the erosion and sedimentation controls which will be implemented during construction (see Section II. H. *Hydrology and Water Quality*.)

Special-Status Plant Species

Special-status plant species include those listed as Endangered, Threatened, Rare or Candidates for listing by the U.S. Fish and Wildlife Service (USFWS), the California Department of Fish and Game (CDFG), and the California Native Plant Society (CNPS). The CNPS listing is sanctioned by the CDFG and serves essentially as their list of “candidate” plant species.

The CDFG has also compiled a list of “Special Plants” which include California Special Concern species. These designations are given to those plant species whose vegetation communities are seriously threatened. Although these species may be abundant elsewhere they are considered to be at some risk of extinction in California. Although Special Concern species are afforded no official legal status under the federal Endangered Species Act (FESA) or the California Endangered Species Act (CESA), they may receive special consideration during the planning stages of certain development projects, and adverse impacts may be deemed significant under the California Environmental Quality Act (CEQA).

Based on a review of the reported occurrences of species in the California Natural Diversity Data Base (CNDDDB), and LOA’s knowledge of the flora of Eastern Contra Costa County, a total of 50 special-status vascular plant species are known to occur in the general project vicinity. (For a full listing and descriptions see Table 1 in the LOA biological report which is contained in Appendix D of this EIR.) However, none of these plant species occurs or potentially occurs on the project site due to the absence of suitable habitat.

Special-Status Animal Species

Special-status animal species include those listed at the federal level by USFWS and at the state level by CDFG. USFWS officially lists species as Threatened or Endangered, or as candidates for listing under

FESA. Additional species receive federal protection under the Bald Eagle Protection Act (e.g., bald eagle, golden eagle), and the Migratory Bird Treaty Act (MBTA); and additional State protection is provided under CESA and CEQA Section 15380(d). In addition, many other species are considered by the CDFG to be species of special concern. Although such species are afforded no official legal status, they may receive special consideration during the planning and CEQA review stages of certain development projects.

A total of 31 special-status animal species were identified as having potential to occur in the project area. Of these, only three species could potentially occur on the site. The remaining 28 species would be absent from or unlikely to occur on the site because suitable habitat for these species is absent.

The three species that may occur on the site consist entirely of the following avian species: white-tailed kite, burrowing owl, and loggerhead shrike. Of these, the white-tailed kite and loggerhead shrike might rarely or occasionally occur on the site as transients, occasional foragers, or winter migrants. The ruderal grassland habitat of the site is regionally abundant; therefore, the loss of approximately 3.7 acres of foraging habitat for these species is not significant.

The only special-status species which was observed to be present on the site in May 2008 is the burrowing owl. (For a full description of the burrowing owl and its habitat requirements, see the LOA report in Appendix D of this EIR.) As mentioned above, burrowing owls were found elsewhere on the Williamson Ranch Plaza site in late 1998, and mitigation was required for lost burrowing owl habitat in the form of off-site replacement acreage. This replacement acreage provided mitigation for the loss of burrowing owl habitat over the entire 33-acre Williamson Ranch Plaza site, including the subject 3.7-acre expansion area.

REGULATORY SETTING

General Plan

The Resource Management Element of the City of Antioch General Plan contains the following objectives and policies on biological resources which are relevant to this project:

10.4.1 Biological Resources Objective

Preserve natural streams and habitats supporting rare and endangered species of plants and animals.

10.4.2 Biological Resources Policies

- d. Through the project approval and environmental review processes, require new development projects to protect sensitive habitat areas, including, but not limited to, oak woodlands, riparian woodland, vernal pools, and *native* grasslands. Ensure the preservation in place of habitat areas found to be occupied by state and federally protected species.
 - If impacts to sensitive habitat areas are unavoidable, appropriate compensatory mitigation shall be implemented through provisions of a Resource Management Plan (“RMP”) as described in Policy 10.3.2.e, except where, in the discretion of the Community Development Director, an RMP is not necessary or appropriate due to certain characteristics of the site and the project. Among the factors that are relevant to determining whether an RMP is necessary or appropriate for a given project are the

size of the project and the project site, the location of the project (e.g., proximity to existing urban development or open space), the number and sensitivity of biological resources and habitats on the project site, and the nature of the project (e.g., density and intensity of development).

- j. Whenever a biological resources survey is undertaken to determine the presence or absence of a threatened or endangered species, or a species of special concern identified by the U.S. Fish and Wildlife Service or the California Department of Fish and Game, require the survey to follow established protocols for the species in question prior to any final determination that the species is absent from the site.

[Note: The federal and state statutes and regulations pertaining to plants and wildlife are briefly discussed above under ‘Environmental Setting’, and in greater detail in the LOA biological report in Appendix D of this EIR.]

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines, Appendix G, the project would be considered to have a significant impact on biological resources if it would:

- 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 Game 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 Game or U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on federally-protected wetlands as defined by Section 404 of the Clean Water Act (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.
- Conflict with the provisions of an adopted Habitat Conservation Plan, or other approved local, regional, or state habitat conservation plan.

[Note: Of the six significance criteria listed above, only the first one is associated with a potentially significant impact. For the additional five checklist items, the initial scoping for this EIR determined that the project would result in no impacts or less-than-significant impacts with respect to these items. These initial findings are supported by the results of the biological report by Live Oak Associates which is contained in Appendix D. The determinations related to each of these items are discussed briefly in Section III. *Effects Found Not to Be Significant.*]

IMPACTS AND MITIGATION

The 1998 IS/MND included an impact statement regarding the potential for burrowing owls to occupy the site prior to construction and identified mitigation measures to be implemented in the event such occupation occurred. The following revised impact statement and more specific mitigation measures reflect current standards of biological resources protection, although the practical effect would be the same as the original measure.

Project-Specific Impacts

Impact C1. Disturbance to Nesting Burrowing Owls. The project could adversely affect burrowing owls which could establish a nest on the project site prior to commencement of project grading and construction. (Potentially Significant Impact)

As discussed above, nesting burrowing owls were observed on the 3.7-acre expansion site in May 2008. Construction activities which would cause nest failure to breeding owls, or that would result in the death of an individual owl would be considered a “taking” under State and federal law and would constitute a significant impact under CEQA. As discussed under ‘Background Discussion’ above, while the previous acquisition of off-site replacement acreage to compensate for the Williamson Ranch Plaza’s impacts to burrowing owl habitat constitutes full mitigation for habitat loss, it does not permit individual owls to be harmed, injured, or killed. Any such harm to individual owls would be considered a “take” of the species, which is not mitigable and would constitute a violation of the California Endangered Species Act and the federal Migratory Bird Treaty Act.

Mitigation C1. To avoid potential “take” of burrowing owls, the following measures shall be implemented in conjunction with the project:

- **Within 30 days of scheduled ground disturbance, the project applicant shall retain a qualified biologist to conduct protocol surveys in order to ensure that nesting or roosting owls are absent from the site. If these surveys demonstrate that owls are absent, then ground disturbance may proceed without any impediment. On the other hand, if nesting burrowing owls are detected on-site prior to ground disturbance, then the applicant shall establish a 250-foot construction free buffer around the active nest, with the perimeter of the buffer zone clearly delineated by flagged survey stakes or construction fencing. No equipment or activity shall be allowed within the buffer zone until the owls have either vacated the nest (e.g., due to nest failure) or the young have fledged (usually no later than mid-September), as determined by a qualified biologist. Additionally, the applicant shall inform both the City of Antioch and the California Department of Fish and Game (CDFG) of the presence of the owl(s) and the establishment of the buffer.**
- **If ground disturbance is to occur after the breeding season or a non-nesting owl inhabits a burrow during the nesting season (i.e., February 1 through August 31), the applicant may proceed with grading provided that the standard measures to passively relocate the owls are implemented by a qualified biologist. The applicant shall inform CDFG of their intent to passively relocate non-**

nesting owls and then a qualified biologist shall place one-way doors in all potential burrows on site. These doors shall remain in place for three days and be inspected daily by a qualified biologist. In the event that new burrows of suitable size for burrowing owls are created after the placement of the one-way doors, additional doors shall be installed in these newly constructed burrows and shall remain in place for a minimum of three days. Burrows may be collapsed after three days upon a determination by a qualified biologist that they are absent of owls. (The foregoing are standard measures prescribed by CDFG.)

Significance after Mitigation. Less-than-Significant Impact.

Cumulative Impacts

Impact C2. **Cumulative Impacts to Biological Resources.** Upon mitigation for biological impacts associated with the project and other cumulative projects in the vicinity, the residual biological impacts from these projects, when taken together, would not be cumulatively significant. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Impacts to Biological Resources

The proposed project would potentially result in one kind of significant biological impact; specifically, potential future impacts to individual burrowing owls. The geographic scope for impacts to protected burrowing owls is considered to be region-wide. While the overall range of this species is very large and covers large areas of the state, biologists evaluate the overall health of the species on a region by region basis. In this case, the regional range of the burrowing owl would consist of eastern Contra Costa County. Within this region, the burrowing owl would potentially be subject to cumulative impacts from hundreds of development projects which have been proposed or approved, or are reasonably foreseeable in eastern Contra Costa County.

Cumulative Impact Analysis

With respect to impacts to individual burrowing owls whose nesting may be disturbed by cumulative development, it is expected that any potential impacts to individual burrowing owls from the cumulative projects would be avoided or mitigated on a project-specific basis in each case throughout the region, as required by State and federal law. It is noted that although the project impacts to burrowing owl habitat (as distinct from impacts to individual owls) were previously mitigated in conjunction with project approval for the overall Williamson Ranch Plaza project, the mitigation for cumulative loss of burrowing owl habitat elsewhere in the region is provided through the East Contra Costa Habitat Conservation Plan. (Although the City of Antioch is not a participant in this plan, it is expected that cumulative loss of burrowing owl habitat within Antioch would be provided on a case-by-case basis, as required by law, and in accordance with the policy and practice of the City of Antioch.) The potential impacts of the project to individual burrowing owls would likewise be reduced to less-than-significant levels, as provided in Mitigation C1,

such that its contribution to cumulative impacts to individuals of the species would not be cumulatively considerable.

Mitigation. **No additional mitigation required.**

REFERENCES/BIBLIOGRAPHY

City of Antioch, *Draft General Plan Update Environmental Impact Report*, July 2003.

City of Antioch, *General Plan*, November 2003.

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County of Contra Costa, *Contra Costa County General Plan 1995- 2010*, July 1996.

Live Oak Associates, *Biotic Evaluation, Walmart Expansion Site, Antioch, Contra Costa County, California*, August 2009.

Twining Laboratories, *Phase I Environmental Site Assessment, Northwest of Lone Tree Way and Hillcrest Avenue, Antioch, California*, October 1997.

U.S. Department of Agriculture, Soil Conservation Service, *Soil Survey of Contra Costa County*, 1977.

D. CULTURAL RESOURCES

ENVIRONMENTAL SETTING

Prehistoric Archaeology

As discussed in the 1998 IS/MND, the project site lies within an area of low sensitivity for archaeological resources. The previous archaeological records search conducted by William Self Associates in conjunction with the IS/MND found no records of previously undiscovered archaeological resources within the project site or in the immediate vicinity. An archaeological field survey of the then-vacant Williamson Ranch Plaza site found no surface evidence of archaeological resources. Subsurface excavation and grading for development of the now-completed portions of the Williamson Ranch Plaza encountered no buried archaeological resources. The City of Antioch staff reports that no archaeological resources have been discovered in conjunction with the substantial development that has occurred in southeast Antioch since 1998. Given the generally low archaeological sensitivity of the site and its surroundings, and the negative findings of the previous archaeological field survey conducted on the site, the absence of subsurface discoveries during previous construction activity on the adjacent parcels or the surrounding area, as well as the highly disturbed nature of the undeveloped project expansion area, no additional archaeological field inventories were conducted or warranted for purposes of this EIR.

The Native American Heritage Commission (NAHC) was contacted to determine if any portion of the site is listed on the Sacred Lands Inventory. The NAHC responded that a record search of the sacred land file failed to indicate the presence of Native American resources in the immediate project area.

Historic-Era/Architectural Resources

There are no historic-era structures or buildings (i.e., at least 50-years old) on the project site, and none are known to have been present on the site in the past. The IS/MND noted that the nearest recorded historic site is the Williamson Ranch (CA-CCO-532H) which is located directly south of the project site, within Williamson Ranch Park on the south side of Lone Tree Way.

Paleontological Resources

The IS/MND, which was adopted in June 1998, did not address paleontological resources. Prior to the October 1998 amendments to the CEQA Guidelines, paleontological resources (i.e., fossils of plants and animals deposited at least 10,000 years ago) were not explicitly recognized or protected under CEQA. The potential destruction of paleontological resources was enumerated as a CEQA impact with the 1998 amendments to the Guidelines, and was added to the CEQA Initial Study Checklist (in Appendix G of the CEQA Guidelines) as a potential impact to be addressed in environmental documents. The MND was adopted in June 1998, prior to the Guidelines amendments, and as such the IS/MND did not address potential impacts to paleontological resources. Since this Subsequent EIR is prepared pursuant to the current CEQA Guidelines, this document must address the issue of paleontological resources, since it was not addressed in the previous IS/MND.

As discussed in the City of Antioch General Plan, numerous fossils have been collected from the Antioch Planning Area, and fossils have been collected from almost all of the sedimentary formations located in Antioch (General Plan, pp. 10-14). The bedrock underlying the expansion site and the nearby hillsides consists of the Markley Formation, an Eocene-age sandstone and shale which is known to contain

primarily fossils of microscopic marine life (microfossils), but also includes some vertebrate (fish) fossils. The bedrock at the site is covered with alluvial clays to a depth of at least 19 feet. However, according to information provided by consulting paleontologist Bruce Hanson, fossil material (microfossils but not vertebrate fossils) could have been eroded from the nearby hillsides to the northwest and been carried to the site.

REGULATORY SETTING

General Plan

The Resource Management Element of the City of Antioch General Plan includes the following policies on cultural resources which are relevant to the project:

10.9.1 Cultural Resources Objective

Preserve archaeological, paleontological, and historic resources within the Antioch Planning Area for the benefit and education of future residents.

10.9.2 Cultural Resources Policies

- a. Require new development to analyze, and therefore avoid or mitigate impacts to archaeological, paleontological, and historic resources. Require surveys for projects having the potential to impact archaeological, paleontological, or historic resources. If significant resources are found to be present, provide mitigation in accordance with applicable CEQA guidelines and provisions of the California Public Resources Code.
- b. If avoidance and/or preservation in the location of any potentially significant cultural resource is not possible, the following measures shall be initiated for each impacted site:

[The remainder of this policy specifies in detail the steps to be carried out during the course of subsurface investigations and testing, and the procedures to be followed in determining adequate mitigation, if appropriate.]

- c. When existing information indicates that a site proposed for development may contain paleontological resources, a paleontologist shall monitor site grading activities with the authority to halt grading to collect uncovered paleontological resources, curate any resources collected with an appropriate repository, and file a report with the Community Development Department documenting any paleontological resources found during site grading.
- d. As a standard condition of approval for new development projects, require that if unanticipated cultural or paleontological resources are encountered during grading, alteration of earth materials in the vicinity of the find be halted until a qualified expert has evaluated the find and recorded identified cultural resources.

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines, Appendix G, the project would be considered to result in a significant impact to cultural resources if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the State CEQA Guidelines.
- Cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5 of the State CEQA Guidelines.
- Directly or indirectly destroy a unique paleontological resource or site.
- Disturb any human remains, including those interred outside of formal cemeteries.

IMPACTS AND MITIGATION

The 1998 IS/MND included an impact statement regarding the potential for encountering cultural material during construction and identified mitigation measures to be implemented in the event such discoveries were made. The following revised impact statement and more specific mitigation measures reflect current standards of archaeological practice, although the practical effect would be the same.

Project-Specific Impacts

Impact D1. Disturbance of Buried Archaeological Resources. It is possible that previously undiscovered cultural materials (prehistoric and historic), including human remains, may be buried on the site which could be adversely affected by grading and construction for the project. (Potentially Significant Impact)

Due to the absence of any evidence that any prehistoric or historic-era archaeological resources are present at the site, the probability that such resources exist is low. Therefore, no further archaeological investigation is necessary prior to site grading. Likewise, no archaeological or paleontological monitoring is recommended during site grading and construction.

Mitigation D1. Implementation of the following measures will mitigate any potential impacts to archaeological resources:

- If any prehistoric or historic artifacts, or other indications of archaeological resources are found once project construction is underway, all work in the within 25 feet of the find must stop and the City shall be immediately notified. An archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology, as appropriate, shall be retained to evaluate the finds and recommend appropriate mitigation measures for the discovered cultural resources.
- If human remains are discovered, all work must stop in the immediate vicinity of the find, and the Contra Costa County Coroner must be notified, according to Section 7050.5 of the California Health and Safety Code. If the remains are determined to be Native American, the coroner will notify the Native American Heritage Commission, who would identify a most likely descendant to make recommendations to the land owner for dealing with the human remains and any associated grave goods, as provided in Public Resources Code Section

5097.98. The most likely descendant shall complete the inspection within 48 hours of notification by the NAHC.

Significance after Mitigation. Less-than-Significant Impact.

Impact D2. Disturbance of Paleontological Resources. It is unlikely that any paleontological resources which may be present on the project site at depth would be adversely affected by grading, excavation, or construction for the project. (Less-than-Significant Impact)

Although microfossils (and possibly fossils of vertebrate marine life) may be present in the Markley Formation beneath the expansion site, this bedrock is at least 19 feet below existing ground surface at the site. Since it is unlikely that any subsurface excavation for the project will extend lower than eight to 10 feet, the project would not have a potential impact on any paleontological resources contained in the bedrock.

As noted under 'Environmental Setting' above, fossil material could have been eroded from the nearby hillsides to the northwest and carried to the site. However, according to information provided by consulting paleontologist Bruce Hanson, any resources which may occur in the underlying alluvium (above the bedrock) are likely to be found at greater depths than will be affected by grading and excavation for the project (i.e., lower than 10 feet below ground surface). Additionally, these microfossils are abundant in the area (i.e., there are millions if not billions of specimens) and are not considered to be sensitive resources. Thus the potential loss of a very small portion of these fossils would not represent the loss of a rare, unique, or individually important resource to science. Therefore, although a relatively small number of microfossils could potentially be lost as a result of grading and excavation for the project, this would not represent a significant impact to the resource. As such, Mr. Hanson does not believe that additional paleontological work is warranted (e.g., more detailed investigation, monitoring or spot checks of subsurface construction, or contingent mitigations in the event fossils are observed during construction).

Mitigation. No mitigation required.

Cumulative Impacts

Impact D3. Cumulative Impacts to Cultural Resources. There are no known archaeological, historical or resources or significant paleontological resources on the project site or the other cumulative project sites. It is possible that previously undiscovered cultural materials may be buried on cumulative project sites which could be adversely affected by grading and construction for the projects. However, any such potential impacts would be mitigated to less-than-significant levels on a project-specific basis in each case, in accordance with the applicable State and local requirements. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Impacts to Cultural Resources

Impacts to cultural resources tend to be highly localized and rarely extend beyond project boundaries. However, unless impacts to cultural resource sites are properly mitigated, the result could be a cumulatively significant loss of cultural artifacts and information. Therefore, the geographic scope of the cumulative analysis of cultural resources is defined to encompass the City of Antioch planning area.

Cumulative Impact Analysis

Recently, there have been several cultural resources studies conducted in conjunction with large development projects proposed in Antioch (e.g., Roddy Ranch, Aviano, Hillcrest Specific Plan). None of these studies found evidence of prehistoric cultural resources within their respective study areas. The probability that previously undiscovered cultural resources are present at any given development project site is low. Similarly, there is a low probability that significant paleontological resources would be adversely affected by cumulative development in the City of Antioch. However, any such archaeological or paleontological resources would be protected through implementation of the City General Plan policy which requires mitigation of cultural resources impacts as a condition of approval for local development projects. The General Plan policies specifically provide in the event that any cultural materials are discovered during grading or excavation for these projects, all work in the vicinity of the find would cease until the materials are professionally evaluated and properly mitigated. The application of these measures to each cumulative project would mitigate any potential cultural resource impacts to a level such that, when taken together, would result in a less-than-significant cumulative impact.

Mitigation. **No mitigation required.**

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City of Antioch, *Draft General Plan Update Environmental Impact Report*, July 2003.

City of Antioch, *General Plan*, November 2003.

City of Antioch, *Initial Study and Mitigated Negative Declaration for the Williamson Ranch Plaza Project*, May 1998.

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State of California, Native American Heritage Commission, *Letter to Alexis Morris, City of Antioch, Regarding Proposed Antioch Walmart Expansion Project, Contra Costa County*, July 7, 2009.

E. GEOLOGY AND SOILS

ENVIRONMENTAL SETTING

The geologic and soils conditions on the expansion site have not changed, and no new significant geological information has been produced since the Initial Study/MND was adopted in 1998.

Geologic Setting

As discussed in the Initial Study/MND, the nearest fault is the Antioch fault which traverses the area on a northwest-southeast axis approximately one mile west of the project site. Although the Antioch fault is inactive, it is subject to surface creep which could damage structures located on it. The nearest active fault is the Marsh Creek-Greenville fault which is approximately 10 miles west of the project site and runs from the Livermore Valley northwesterly to Clayton. Since no known faults traverse the site, the potential for fault rupture at the site is low, but an earthquake centered on the Marsh Creek-Greenville fault could produce a maximum earthquake of magnitude 6.9.

The potential for liquefaction at the site is low since the site soils consist of cohesive clays which are not subject to liquefaction. However, the on-site clays are moderately expansive.

REGULATORY SETTING

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near active fault traces to reduce the hazards associated with fault rupture and to prohibit the location of most structures for human occupancy across these traces. Cities and counties must regulate certain development projects within the zones, including the preparation of geologic investigations in order to demonstrate that development sites are not threatened by future surface displacement.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act is intended to protect the public from the effects of strong groundshaking, liquefaction, landslides, or other ground failure/hazards caused by earthquakes. This act requires the State Geologist to delineate seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design.

City of Antioch General Plan

The Environmental Hazards Element of the City of Antioch General Plan includes the following policies on geology and soils which are relevant to the project:

11.3.1 Geology and Seismicity Objective

Minimize the potential for loss of life, physical injury, property damage, and social disruption resulting from seismic groundshaking and other geologic events.

11.3.2 Geology and Seismicity Policies

Seismicity

- a. Require geologic and soils reports to be prepared for new development sites, and incorporate the findings and recommendations of these studies into project development requirements. As determined by the City of Antioch Building Division, a site-specific assessment shall be prepared to ascertain potential ground shaking impacts on new development. [The remainder of this policy sets forth the required contents of geologic assessments.]

Other Geologic Conditions

- k. Require specialized soils reports in areas suspected of having problems with potential bearing strength, expansion, settlement, or subsidence, including implementation of the recommendations of these reports into the project development, such that structures designed for human occupancy are not in danger of collapse or significant structural damage with corresponding hazards to human occupants. Where structural damage can be mitigated through structural design, ensure that potential soils hazards do not pose risks of human injury or loss of life in outdoor areas of a development site.

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines, Appendix G, the project would be considered to result in a significant geology and soils impact if it would:

- Expose people or structures to 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 or based on other substantial evidence of a known fault;
 - ii) Strong seismic ground shaking;
 - iii) Seismic-related ground failure, including liquefaction;
 - iv) Landslides.
- Result in substantial soil erosion or the loss of topsoil.
- 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.
- Be located on expansive soil, creating substantial risks to life or property.

- 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.

[Note: Of the significance criteria listed above, only ground shaking and expansive soils have the potential to result in significant impacts at the project site, and as such are addressed below. The subject of soil erosion is addressed in Section II. G. *Hydrology and Water Quality*. For the additional checklist items, the initial scoping for this EIR determined that the project would result in no impacts or less-than-significant impacts with respect to these items. The determinations related to each of these items are discussed briefly in Section III. *Effects Found Not to Be Significant*.]

IMPACTS AND MITIGATION

Although there have been no changes in geologic conditions or information since the Initial Study/MND was adopted, the geologic impacts and mitigation measures identified in the Initial Study/MND are presented below for informational purposes. In some instances, the wording has been altered slightly for clarity. The alpha-numeric identifiers and formatting have been modified to be consistent with the formatting of this EIR.

Project-Specific Impacts

Impact E1. Seismic Ground Shaking. Strong ground shaking expected at the site during a moderate to severe earthquake could potentially result in severe damage to project buildings and other structures. (Potentially Significant Impact)

Mitigation E1. Structural damage to buildings caused by ground shaking shall be minimized by following the requirements of the California Building Code (CBC), and implementing the recommendations of the project geotechnical engineer.

As required by the City of Antioch General Plan, the project would be subject to the seismic design recommendations contained in the geotechnical report to be prepared for the project, as well as the seismic building standards of the CBC as adopted by the City of Antioch.

Significance after Mitigation: Less-than-Significant Impact.

Impact E2. Expansive Soils. Expansive soils on the site could potentially cause damage to on-site structures and foundations. (Potentially Significant Impact)

Mitigation E2. Potential damage due to expansive soils shall be minimized by implementing the site preparation, drainage and foundation recommendations of the project geotechnical engineer.

As required by the City of Antioch General Plan, the project would be subject to the soil engineering recommendations and specifications contained in the geotechnical report to be prepared for the project.

Significance after Mitigation: Less-than-Significant Impact.

Cumulative Impacts

Impact E3. Cumulative Geologic and Soils Impacts. The potential geology and soils impacts would be mitigated on a project-specific basis for all cumulative projects, as required by existing regulations. The less-than-significant geology and soils impacts resulting from the project combined with the residual impacts associated with the cumulative projects would not result in a cumulatively significant impact. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Geologic and Soils Impacts

Since geologic and soils impacts relate to physical site conditions which may have an impact on a proposed project, instead of the project having an impact on its setting, these impacts tend to be highly localized and generally do not extend beyond the boundaries of individual project boundaries (except perhaps in cases where an unreinforced building may collapse into a neighboring property, and the like). Thus the geologic and soils conditions affecting individual projects in the same general vicinity generally would not accumulate to result in a greater level of geologic and soils impact. Given the relatively flat terrain of the site vicinity, and the absence of area-wide geologic hazards, such as landslides, mud slides or debris flows, it is highly unlikely that geologic and soils impacts would extend beyond project boundaries. However, to be conservative for purposes of this EIR, the geographic scope of the cumulative analysis of geologic and soils impacts is considered to be defined by an area extending no more one-half mile beyond the project boundaries. There are two cumulative projects within this radius – the final phase of the Lone Tree Landing commercial project to the east across Hillcrest Avenue, and the final phase of the Williamson Ranch Plaza to the west.

Cumulative Impact Analysis

For the two approved development projects in the site vicinity, the seismic and geologic hazards and any adverse soil conditions would be mitigated at the project level through building code requirements and design recommendations of geotechnical engineers pursuant to geotechnical/soils reports required by the City’s General Plan. While these measures would not completely eliminate the potential for seismic damage, they would reduce the impact to less-than-significant levels at both the project and the cumulative project levels. This also applies to all other cumulative projects in the area which would be subject to the same requirements. Therefore, the cumulative geologic and soils impacts would be less-than-significant.

Mitigation. No mitigation required.

[Note: Erosion and siltation impacts are addressed in Section II. G. Hydrology and Water Quality.]

REFERENCES/BIBLIOGRAPHY

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Twining Laboratories, *Phase I Environmental Site Assessment, Northwest of Lone Tree Way and Hillcrest Avenue, Antioch, California*, October 1997.

U.S. Department of Agriculture, Soil Conservation Service, *Soil Survey of Contra Costa County*, 1977.

F. HAZARDS AND HAZARDOUS MATERIALS

BACKGROUND DISCUSSION

A Phase I environmental site assessment (ESA) was conducted on the Williamson Ranch Plaza site by Twining Laboratories in October 1997. The Phase I ESA is incorporated into this EIR by reference, as provided under CEQA Guidelines Section 15150. That report identified several debris piles that were removed prior to development of the surrounding portions of the site. The report also identified a former exploratory oil well that was properly abandoned and sealed prior to construction of the existing Walmart store over the former well site. The Phase I study found no evidence of soil or groundwater contamination on the site, or any indications to suggest that contamination might exist.

ENVIRONMENTAL SETTING

The Phase I environmental site assessment completed by Twining Laboratories found no evidence or indications of potential soil or groundwater contamination at the expansion site. No activities have taken place on or in the vicinity of the expansion site which would raise a suspicion that site contamination may occurred in the interim. As such, no further site contamination studies were conducted or warranted in conjunction with this EIR.

Although the operations of the existing Walmart store to the east and the Orchard Supply Hardware store to the west involve the transport, handling, storage, and use of certain hazardous materials (e.g., Walmart's Tire and Lube Express), these operations are conducted in accordance with up-to-date Hazardous Materials Business Response Plans and other applicable federal, State, and local regulations and requirements. As such, the potential that the expansion site has been subject to contamination as a result of these activities is very remote.

REGULATORY SETTING

City of Antioch General Plan

The Environmental Hazards Element of the City of Antioch General Plan includes the following policies on hazardous materials which are relevant to the project:

11.7.1 Hazardous Materials Objective

Minimize the negative impacts associated with the storage, use, generation, transport, and disposal of hazardous materials.

11.7.2 Hazardous Materials Policies

[Note: The Hazardous Materials Policies primarily apply to generators of significant quantities of hazardous materials. Since the uses in the planned expansion area will not generate hazardous waste or involve the use of substantial quantities of hazardous materials, these policies are not applicable to the project.]

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines, Appendix G, the project would be considered to have a potentially significant hazardous materials impact if it would:

- Create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials.
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- 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 create a significant hazard to the public or the environment.
- For a project located within an airport land use plan or, where such plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area.
- For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

[Note: Of the significance criteria listed above, only the first item is associated with potentially significant impacts, which are addressed below. For the remaining checklist items, the initial scoping for this EIR determined that the project would result in no impacts or less-than-significant impacts with respect to these items. The determinations related to each of these items are discussed briefly in Section III. *Effects Found Not to Be Significant.*]

IMPACTS AND MITIGATION

The following potential impact was not identified in the Initial Study/MND and is newly identified in this EIR.

Project-Specific Impacts

Impact F1. Sale of Household Hazardous Products. Household cleaners, fertilizers, pesticides, oil, automobile products, and other household hazardous materials are sold by Walmart and may be located within the planned expansion area. These products would be safely packaged to prevent harm to employees and consumers, and would be handled,

stored, transported, and disposed of in accordance with applicable federal, State, and local regulations. (Less-than-Significant Impact)

Mitigation. No mitigation required.

Cumulative Impacts

Impact F2. **Cumulative Hazardous Materials Impacts.** The hazardous materials at the project would be handled, stored, transported, and disposed of in accordance with federal, state, and local laws and regulations. It is expected that any potential hazardous materials that may be present at other cumulative project sites would be similarly mitigated. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Hazardous Materials Impacts

Hazardous materials impacts associated with development projects tend to be highly localized and generally do not extend far beyond individual project boundaries, if at all. Therefore, the individual impacts from several projects in the same general vicinity would not tend to accumulate to result in a greater level of impact. Although it is doubtful that hazardous materials impacts would extend beyond project boundaries, for purposes of this EIR the geographic scope of the cumulative analysis of hazardous materials is defined to extend no more 2,000 feet beyond the project boundaries. There are two cumulative projects within this radius – the final phase of the Lone Tree Landing commercial project to the east across Hillcrest Avenue, and the final phase of the Williamson Ranch Plaza to the west.

Cumulative Impact Analysis

Any development that would involve storage, handling and disposal of significant quantities of hazardous materials would be subject to strict controls under federal, state, and/or local regulations, as applicable. This also applies to the other cumulative projects in the area, which would be subject to the same requirements. Therefore, the potential for unauthorized releases of hazardous materials resulting from development of the cumulative projects would be very low, and the cumulative hazardous materials impacts would be not be significant.

Mitigation. No mitigation required.

REFERENCES/BIBLIOGRAPHY

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*II. Environmental Setting, Impacts, and Mitigation Measures
F. Hazards and Hazardous Materials*

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Twining Laboratories, *Phase I Environmental Site Assessment, Northwest of Lone Tree Way and Hillcrest Avenue, Antioch, California*, October 1997.

G. HYDROLOGY AND WATER QUALITY

BACKGROUND DISCUSSION

The original IS/MND for the project relied upon the hydrology and drainage report prepared by Robert A. Karn & Associates in April 1998. That hydrology report included calculations of the increased stormwater runoff that would result from development of the entire Walmart site, including the planned expansion area. The criteria and parameters applied in the design of the original storm drainage system, as required by the City of Antioch and Contra Costa County, have not changed in the intervening years. As such, the hydraulic calculations used in the original system design, as reported in the 1998 IS/MND, are still valid. The hydrology report by Karn & Associates was updated in December 2008 to describe the current storm drainage conditions and planned drainage system for the expansion area. The updated report is incorporated into this EIR by reference, as provided under CEQA Guidelines Section 15150. The report is summarized below and contained in Appendix E of this EIR.

Since the time that the Walmart project was approved in 1998, new water quality protection requirements have been introduced which have resulted in new water quality mitigation measures to be implemented in conjunction with new development projects. The updated hydrology report by Karn & Associates includes a discussion of the new requirements and identifies water quality mitigation measures to be incorporated into the Walmart expansion project. These measures are discussed in detail in the Stormwater Control Plan prepared for the project in October 2008, which is incorporated into this EIR by reference, as provided under CEQA Guidelines Section 15150. The Stormwater Control Plan is also contained in Appendix E, and the new requirements and measures identified therein are summarized below.

ENVIRONMENTAL SETTING

The pre-project drainage conditions on the project site have changed considerably from those described in the 1998 IS/MND. The Walmart site, which was entirely undeveloped in 1998, is now largely occupied by the existing store and adjacent parking, loading, and circulation areas, except for the 3.7-acre expansion area which is still vacant. The developed 17.9-acre portion of the Walmart site is served by an underground storm drainage system designed to collect runoff volumes for the 10-year storm and lesser events. This runoff is discharged to the adjacent East Antioch Creek flood control channel via an outfall located at the northeast corner of the Walmart site. For storms larger than the 10-year event, the excess runoff is directed overland across the developed portion of the site to the creek channel via overland release routes created in accordance with the project grading and drainage plan.

Under current conditions, the majority of the undeveloped 3.7-acre expansion area is not served by a storm drain system. Most site runoff either percolates into the soil, or temporarily ponds until it evaporates, or it flows directly to the adjacent channel of East Antioch Creek. Some of the runoff in the eastern portion of the expansion area enters two temporary field inlets which were installed with the construction of the existing Walmart store. (See the hydrology map in Appendix E of this EIR for the location of the existing drainage system.)

Flooding Potential

The project site is not subject to flooding during the 100-year event. Flows from major flood events in the project vicinity are entirely confined within the channel of the adjacent reach of East Antioch Creek.

REGULATORY SETTING

NPDES Municipal Stormwater Permit

The California State Water Resources Control Board (SWRCB or State Board) and the nine Regional Water Quality Control Boards (RWQCBs or Regional Boards) have the authority in California to protect and enhance water quality, both through their designation as the lead agencies in implementing the Section 319 nonpoint source program of the federal Clean Water Act, and from the state's primary water-pollution control legislation, the Porter-Cologne Act. The San Francisco Bay and Central Valley RWQCBs regulate water quality in Contra Costa County.

Under the 1987 amendments to the Clean Water Act [Section 402(p)], the U.S. Environmental Protection Agency (U.S. EPA) regulates nonpoint pollution sources within the existing National Pollutant Discharge Elimination Program (NPDES). In Phase 1, NPDES permits were issued for urban runoff discharges from municipalities of over 100,000 people, from plants in industries recognized by the EPA as being likely sources of stormwater pollutants, and from construction activities which disturb more than 5 acres. The U.S. EPA has delegated management of California's NPDES Municipal Stormwater Permit program to the State and Regional Boards. Phase 2 implementation, effective March 10, 2003, extended NPDES urban runoff discharge permitting to cities of 50,000 to 100,000 people, and to construction sites which disturb between 1 and 5 acres.

Control of stormwater runoff is a major current focus of the Regional Boards. Urbanized counties and cities that implement a Comprehensive Storm Water Management Plan (CSWP) for urban runoff management meeting Regional Board standards can apply to the RWQCB for a joint city-county NPDES Municipal Stormwater Permit. Upon acceptance, the authority to regulate storm runoff discharges from municipal storm drain systems is transferred to the permit holders, allowing them to more effectively integrate the stormwater control program with other nonpoint source control programs.

The joint city-county Contra Costa Clean Water Program, which includes the City of Antioch, was first granted a 5-year Phase 1 NPDES Municipal Stormwater Permit in January 1994 and the permit was renewed in July 1999. Since the early 1990s, Contra Costa municipalities have required contractors to implement temporary Best Management Practices (BMPs) to minimize the amount of sediment and other pollutants that enter site runoff during construction. For several years, the municipalities have also encouraged applicants to design their projects to minimize new impervious area and to incorporate into their plans permanent treatment BMPs – features and devices that detain, retain, or treat runoff for the life of the project. The standard for these BMPs is “maximum extent practicable,” or MEP.

In February 2003, the RWQCBs amended Provision C.3 of the NPDES permit to promote improved treatment of runoff from new development and significant redevelopment projects by requiring numeric criteria for flow- and volume-based treatment control measures to limit pollutant discharges, consistent with requirements imposed in other jurisdictions throughout the state. The new provisions apply to

projects whose applications were deemed complete after February 15, 2005, and which will create one or more acre of impervious area. Provision C.3 requires that permittees implement BMPs that reduce pollutants in stormwater to the technology-based standard of MEP. The MEP of treatment is considered to be achieved with treatment of 80 percent of average annual runoff volume from the development area. Because a large portion of average annual runoff is produced by small storms that occur many times a year, treatment BMPs can be designed to bypass larger storms. The 80 percent criterion means that BMPs will be bypassed, on average, every 1-2 years.

NPDES General Permit for Discharges of Storm Water Associated with Construction Activity

Since the proposed project would disturb more than 1 acre of land, the project will be subject to the NPDES General Permit for Discharges of Storm Water Associated with Construction Activity. Administration of these permits has not been delegated to cities, counties, or Regional Boards but remains with the State Board. Enforcement of permit conditions, however, is the responsibility of Regional Board staff, assisted by local municipal or county staff. Prior to construction grading for the project, the applicant will be required to file a “Notice of Intent” (NOI) with the State Board to comply with the General Permit and prepare a Storm Water Pollution Prevention Plan (SWPPP) which addresses measures to be included in the project to minimize and control construction and post-construction runoff. The SWPPP details the site-specific best management practices (BMPs) to control erosion and sedimentation and maintain water quality during the construction phase. The SWPPP also contains a summary of the structural and non-structural BMPs to be implemented during the post-construction period, pursuant to the nonpoint source practices and procedures encouraged by the Contra Costa Clean Water Program and the City of Antioch. (See Impact G3 below for a description of post-construction measures contemplated for the expansion project). The SWPPP is to be kept on-site during construction, and is to be updated each year as site development proceeds.

City of Antioch General Plan

The City of Antioch General Plan contains the following objectives, policies, and performance standards related to drainage, flooding, and surface water quality which are relevant to the project:

Growth Management Element

3.5.3 Flood Control

3.5.3.1 Performance Objective. Ensure adequate facilities to protect Antioch residents and businesses from damaging flood conditions.

3.5.3.2 Performance Standard. Provide sufficient facilities development to protect structures for human occupancy and roadways identified as evacuation routes from inundation during the 100-year flood event.

Public Services and Facilities Element

8.7.1 Storm Drainage and Flood Control Objective

Conduct all storm water via adequately sized storm drains and channels.

8.7.2 Storm Drainage and Flood Control Policies

- b. Require adequate infrastructure to be in place and operational prior to occupancy of new development, such that:
 - new development will not negatively impact the performance of storm drain facilities serving existing developed areas, and
 - the performance standards set forth in the Growth Management Element will continue to be met.
- e. Require new developments to provide erosion and sedimentation control measures to maintain the capacity of area storm drains and protect water quality.
- f. Require implementation of Best Management Practices in the design of drainage systems to reduce discharge of non-point source pollutants originating in streets, parking lots, paved industrial work areas, and open spaces involved with pesticide applications.

Resource Management Element

10.7.1 Water Resources Objective

Ensure that an adequate supply of water is available to serve existing and future needs of the City.

10.7.2 Water Resources Policies

Water Quality

- g. Require public and private development projects to be in compliance with applicable National Pollutant Discharge Elimination System (NPDES) permit requirements, and require the implementation of best management practices to minimize erosion and sedimentation resulting from new development.
- i. Design drainage within urban areas to avoid runoff from landscaped areas and impervious surfaces from carrying pesticides, fertilizers, and urban and other contaminants into natural streams.

Environmental Hazards Element

11.4.1 Flood Protection Objective

Minimize the potential for loss of life, physical injury, property damage, and social disruption resulting from flooding.

11.4.2 Flood Protection Policies

- d. Require new development to prepare drainage studies to assess storm runoff impacts on the local and regional storm drain system, along with implementation of appropriate detention and drainage facilities to ensure that the community's storm drainage system capacity will be maintained and peak flow limitations will not be exceeded.

Antioch Municipal Code

Chapter 9 of the Antioch Code of Ordinances (Municipal Code) requires the preparation and implementation of a Stormwater Control Plan for all developments that create 10,000 square feet or more of impervious surfaces. This chapter implements the Basin Plan's Provision C.3 requirements under the NPDES Municipal Stormwater Permit as discussed under Regulatory Setting above.

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines, Appendix G, the project would be considered to result in a significant hydrological or water quality impact if it would:

- Violate any water quality standards or waste discharge requirements.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in 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.
- Otherwise substantially degrade water quality.
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Inundation by seiche, tsunami, or mudflow.

[Note: Of the significance criteria listed above, all but the second item and the last four items are associated with potentially significant project impacts, which are addressed below. For the remaining checklist items, the initial scoping for this EIR determined that the project would result in no impacts or less-than-significant impacts with respect to these items. The determinations related to each of these items are discussed briefly in Section III. *Effects Found Not to Be Significant.*]

IMPACTS AND MITIGATION MEASURES

Project-Specific Impacts

Impact G1. Increased Stormwater Runoff. The Walmart expansion project would increase stormwater runoff generated at the expansion site compared to existing conditions; however, the storm drain system for the expansion project would avoid drainage and flooding impacts. (Less-than-Significant Impact)

The expansion project would involve the coverage of most of the 3.7-acre expansion area with impervious surfaces. This would increase the velocity of peak runoff leaving the site by about 3.73 cubic feet per second (cfs). The existing runoff rate at that site is approximately 24.62 cfs for a 100-year storm event, taking into account the 17.9-acre developed area and the 3.7-acre undeveloped expansion area. The development of the expansion area would increase the overall runoff rate from the site to 28.35 cfs during the 100-year storm event. This runoff rate is the same as the overall runoff rate calculated by Karn & Associates for the larger 22.5-acre Walmart site that existed in 1998. (As noted in the Section I. *Project Description*, the overall Walmart site was reduced by 0.9 acres through a subsequent lot line adjustment.) Although the site plan for the expansion area has been modified, the amount of impervious surface coverage resulting from the currently planned Walmart expansion is assumed to be the same as originally planned. Since the 21.6-acre site is almost one acre smaller than the site upon which the original calculations were based, this somewhat conservative assumption may result in a slight overstatement of the runoff rate, and therefore represents worst-case conditions.

The storm drainage from the expansion area will be collected by an underground storm drainage system designed to convey runoff from the planned expanded area to the existing Walmart storm drain system, which was designed to accommodate drainage from the expansion area upon development. The expanded system will connect to the existing system at two locations, at the northwest and southwest corners of the expanded building, where the existing system includes two pipe stub-outs intended for this connection. Within the expanded parking lot area, the collected stormwater will be treated by in-ground planters to be installed between the rows of parking and by a bioretention area planned for and in the northwest corner of the project site (see 'Impact G3' below for discussion). After treatment, the runoff from the expansion area will be conveyed to the existing outfall on East Antioch Creek at the northwest corner of the Walmart site. No new outfall at the creek channel is planned in conjunction with the expansion project.

As mentioned, the storm drain system for the entire project was originally designed to accommodate post-development drainage for the 10-year event from the entire Walmart site, as required by the County of Contra Costa. Storm water from events exceeding the 10-year storm will be conveyed overland across the expansion site to the creek channel along the north site boundary. The final site grades have been designed to facilitate this overland release to the north.

The East Antioch Creek flood control channel has been sized and designed to accommodate the post-development storm runoff and flood flows generated at the project site, including the expansion area. Therefore, the Walmart expansion project will not result in drainage impacts or increased downstream flooding potential.

Mitigation. **No mitigation required.**

Impact G2. Construction-Related Impacts to Water Quality. **During grading and construction, erosion of exposed soils and pollutants from equipment may result in water quality impacts to downstream water bodies. (Significant Impact)**

[Note: The above impact was identified in the 1998 IS/MND, and is presented here for information. The following is an expanded discussion of the potential water quality impacts associated with grading and construction.]

The development of the project site would involve site clearing, rough grading, excavation, trenching, and final grading for parking areas, building pads, and utilities. Once vegetation is removed, the exposed and disturbed soil would be susceptible to high rates of erosion from wind and rain, resulting in sediment transport from the site. Sediment impact on water quality includes interference with photosynthesis, oxygen exchange, and respiration, growth, and reproduction for aquatic species. After the project has been constructed and the landscaping has been installed, erosion potential would be minimal.

Delivery, handling and storage of construction materials and wastes, as well as use of construction equipment on-site during the construction phase of the project, also introduce a risk for stormwater contamination which could adversely affect water quality. Spills or leaks from heavy equipment and machinery can result in oil and grease contamination of stormwater. Some hydrocarbon compound pollution associated with oil and grease can be toxic to aquatic organisms at low concentrations. Staging areas and building sites can be the source of pollution due to paints, solvents, cleaning agents, and metals contained in the surface of equipment and materials. The impacts associated with metal pollution of stormwater include toxicity to aquatic organisms, bioaccumulation of metals in aquatic animals, and potential contamination of drinking supplies. Pesticide use (including herbicides, fungicides, and rodenticides) associated with site preparation work is another potential source of stormwater contamination. Pesticide impact to water quality includes toxicity to aquatic species and bioaccumulation in larger species through the food chain. Gross pollutants such as trash, debris, and organic matter are additional potential pollutants associated with the construction phase of the project. Impacts include health hazards and aquatic ecosystem damage associated with bacteria, viruses and vectors which can be harbored by gross pollutants.

Mitigation G2. A comprehensive erosion control and water pollution prevention program shall be implemented during site clearing, demolition, grading, and construction. Practices to be implemented to minimize water quality impacts during the grading and construction phase would include but not be limited to the following:

- **Exposed soils would be stabilized by the end of October of any given year by revegetating disturbed areas or applying hydromulch with tetra-foam or other adhesive material.**
- **Runoff from areas of exposed soils would be conveyed to siltation basins to provide for the settling of eroded sediments.**
- **Storm drain inlets would be protected with fiber roll and filter fabric, screen and gravel.**
- **Measures would be implemented to prevent runoff of fuel, oil, lubricants and solvents from areas used for construction vehicle and equipment storage, washing and maintenance. This would include the containment of temporary storage and other service areas with dikes.**

[Note: The above mitigation measure is a slightly modified version of the corresponding measure in the 1998 IS/MND. The revised measure is more comprehensive in its scope but does not alter the intent or meaning of the original measure. The following is an expanded discussion of mitigation for construction-related water quality impacts.]

The project will be subject to the U.S. EPA's National Pollutant Discharge Elimination System (NPDES) permit requirements for construction activities. These are implemented at the state level through the General Permit for Discharges of Storm Water Associated with Construction Activity, as administered by the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB). Prior to construction grading for the project, the applicant will be required to file a "Notice of Intent" (NOI) with the SWRCB to comply with the General Permit and prepare a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would detail the treatment measures and best management practices (BMPs) to control pollutants that would be implemented during the construction and post-construction phases of project development.

The SWPPP must show that the project would effectively minimize soil erosion and sedimentation from the proposed project site and must also provide for the control of runoff from the site. Erosion control for the project might include such measures as: designation of restricted-entry zones, sediment tracking control practices, diversion of runoff away from disturbed areas, protective measures for sensitive areas, outlet protection, and provision for revegetation or mulching for soil stabilization. The SWPPP would also prescribe treatment measures to trap sediment once it has been mobilized, at a scale and density appropriate to the size and slope of the catchment. These measures typically include: inlet protection, straw bale barriers, straw mulching, straw wattles, silt fencing, check dams, terracing, and siltation or sediment ponds.

In addition to the erosion and sediment-control measures, the SWPPP would include construction-phase housekeeping measures for control of contaminants such as petroleum products, paints and solvents, detergents, fertilizers, and pesticides, as well as vehicle and equipment fueling and maintenance practices, and waste management and disposal control practices, among other things. The SWPPP must identify the responsible entities

for both the construction and post-construction periods, and include provisions for monitoring of discharges to stormwater systems. The SWPPP is to be kept on-site during construction, where it is subject to inspection by the RWQCB. It is to be updated each year as site development proceeds.

The applicant has indicated that Walmart's Standard Operating Procedures would require the preparation and implementation of Erosion and Sedimentation Control Plan and Specifications for the project, which would typically include many of the measures mentioned above.

Significance after Mitigation: Less-than-Significant Impact.

Impact G3. Urban Nonpoint Source Pollution. The project would generate urban nonpoint contaminants which may be carried in stormwater runoff from paved surfaces to downstream waterbodies. (Significant Impact)

[Note: The above impact was identified in the 1998 IS/MND, and is presented here for information. The following is an expanded discussion of the potential water quality impacts associated with project operation.]

Once the project buildings and parking lots have been constructed and the landscaping is installed, typical urban runoff contaminants would include: petroleum products, heavy metals, and sediments from vehicles; pesticides, fertilizers and plant debris from landscaped areas; and litter. These pollutants would be flushed by storm runoff into the storm drainage system and downstream waterbodies, particularly the San Joaquin River, where they would contribute to cumulative nonpoint contaminant loads and result in incremental deterioration of water quality. Excess nutrients from fertilizers can impact water quality by promoting excessive and/or rapid growth of aquatic vegetation; reducing water clarity, and resulting in oxygen depletion. Pesticides also may enter into stormwater after application on landscaping areas of the project. Pesticides are toxic to aquatic organisms and can bioaccumulate in larger species such as birds and fish. The adverse effects associated with hydrocarbons, metals, and gross pollutants such as organic matter and litter are discussed under 'Impact G2' above.

Mitigation G3. To minimize downstream nonpoint source pollution, the management of project storm drainage would include pre-treatment of site runoff through installation of bioretention areas and in-ground planters throughout the new parking lot within the 3.7-acre expansion area, as well as other operational measures, as specified under Provision C.3 of the City's NPDES Municipal Stormwater Permit.

[Note: The above mitigation measure was generally identified in the 1998 IS/MND, and modified here in response to changes in water quality protection measures required for the project under the City's NPDES permit.]

In order to meet the requirements of the amended Provision C.3 of the NPDES permit (see 'Regulatory Context' above for discussion), the project will incorporate operational measures for protection of surface water quality. The primary BMP (Best Management

Practice) will be the installation of bioretention areas and infiltration planters within the new parking area planned to the west of the planned building expansion area. (See the hydrology reports in Appendix E for illustrations and a full discussion.) The bioretention areas and infiltration planters will treat the major portion of stormwater generated within the 3.7-acre expansion area before it is discharged to the East Antioch Creek flood control channel. The bioretention areas remove pollutants by filtering runoff slowly through an active layer of soil. Planter boxes capture runoff from downspouts or sheet flow from paved areas. The runoff briefly floods the surface of the box and then percolates through an active soil layer to drain rock below. The amount of bioretention area and infiltration planters required for the expansion area was calculated by the project engineers based on numeric standards set forth by the Regional Board. The proposed bioretention areas and infiltration planters were reviewed by City staff to ensure that they met the applicable design standards. (Note that since the existing Walmart storm drain system was installed prior to the adoption of the current Provision C.3 treatment criteria, the existing system is not subject to the C.3 requirements.) The bioretention areas and infiltration planters will be subject to regular inspection and maintenance in order to ensure proper function. These measures are specified in the project Stormwater Control Plan (contained in Appendix E of this EIR), and are to be performed by Walmart.

In addition to the bioretention areas described above, other BMPs specified in the project Stormwater Control Plan include: regular parking lot cleaning; loaded and unloaded items will be moved indoors as soon as possible; washwater will be directed away from storm drain inlets and conveyed to sanitary sewers. Stormwater catch basins would be stenciled to discourage illegal dumping. In the landscaped areas, application of irrigation water and fertilizers and pesticides would be minimized in order to minimize potential for contaminated runoff.

Significance after Mitigation: Less-than-Significant Impact.

Cumulative Impacts

Impact G4. Cumulative Hydrology and Water Quality Impacts. The potential hydrology and water quality impacts would be mitigated on a project-specific basis for all cumulative projects, as required by existing regulations and programs, particularly the State law requirement to prepare and implement Storm Water Pollution Prevention Plans (SWPPPs), and the NPDES requirement for treatment of post-construction surface runoff. Therefore, the residual hydrology and water quality impacts resulting from the project in combination with the other cumulative projects would not result in a cumulatively significant impact. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Hydrology and Water Quality Impacts

The study area for cumulative hydrology and water quality impacts is defined by the drainage area where a project is located and to which it contributes runoff. For the project site, the local drainage area consists of the watershed of East Antioch Creek which drains an

area of about five square miles comprising central and eastern Antioch. This drainage area comprises the study area for cumulative hydrologic impacts. The list of approved, pending, and reasonably foreseeable projects contained in Table 2 includes the projects which would contribute runoff to East Antioch Creek.

Cumulative Impact Analysis

The flood control channel of East Antioch Creek was designed and constructed to accommodate stormwater runoff from the 100-year event with buildout of General Plan land uses. As such, the incremental increases in runoff resulting from the development of the cumulative projects within the watershed would be received and conveyed by the East Antioch Creek flood control channel without resulting downstream flooding. Similarly, storm drainage facilities which provide drainage for urban land uses and which are tributary to East Antioch Creek would be designed and constructed to accept design flows from urbanized conditions under the General Plan, as required by the City of Antioch for all development projects. Individual project grading and drainage plans would be designed to convey stormwater runoff to off-site drainage facilities without resulting in on-site or downstream flooding. As such, the cumulative hydrology and drainage impacts resulting from the development of the cumulative projects would be less than significant.

The potential water quality impacts resulting from soils erosion would be mitigated on a project-specific basis for all cumulative projects, through the preparation and implementation of Storm Water Pollution Prevention Plans (SWPPPs) for each project, as required by the City and State and federal regulations and programs. The incremental contribution of urban pollutants to downstream water bodies will be mitigated through implementation of on-site stormwater treatment for the cumulative projects as required under Provision C.3 of the Basin Plan for all projects over 10,000 square feet, as required by the Regional Water Quality Control Board and the City of Antioch. As a result of the implementation of the project-specific SWPPPs and C.3 treatment measures the cumulative water quality impact would be less than significant.

In summary, the cumulative drainage, flooding, and water quality impacts would be less-than-significant.

Mitigation. **No mitigation required.**

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G. Hydrology and Water Quality

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H. LAND USE AND PLANNING

ENVIRONMENTAL SETTING

On-Site Land Use

The majority of the 21.6-acre Walmart site is developed with the existing discount store and surrounding parking, loading, and landscaped areas. The westerly 3.7-acre portion of the site (i.e., planned expansion area) is vacant and is covered with weedy vegetation. There are no significant trees or other notable vegetation in the planned expansion area. There is a temporary stormwater drainage basin on the eastern portion of the expansion area, adjacent to the existing Walmart parking and circulation area.

Surrounding Land Use

The remaining portions of the Williamson Ranch Plaza are built-out with commercial retail, professional office, and restaurant uses. The land uses immediately to the north, west and south of the Williamson Ranch Plaza are essentially the same as existed in 1998. The site is bordered on the north by East Antioch Creek, an excavated flood control channel with a width of approximately 115 feet in this reach. To the north of the channel is the Parkside neighborhood of single-family dwellings, of which 18 homes back onto the creek channel across from the Walmart property. To the west lies the Prewett Family Park. The Mokelumne Aqueduct runs underground along the southern project frontage. Across Lone Tree Way to the south is a community park which includes the historic Williamson Ranch complex, beyond which is the Williamson Ranch residential community.

In 1998, the lands to the east of the project site were largely in grazing land or vacant. Since that time, the nearby lands to the east and southeast have been developed, or are currently under development. (Much of the formerly vacant land extending to the Brentwood City boundary has been developed for single- and multi-family residential and commercial retail projects.) There is no substantial vacant land remaining in the project vicinity. Major improvements have also been made to public facilities in the area including the widening of Lone Tree Way and the realignment and enlargement of downstream segments of the East Antioch Creek flood control channel. In 2007, the northern section (Phase 1) of the State Route 4 Bypass was completed and opened approximately one mile east of the project site.

REGULATORY SETTING

City of Antioch General Plan

Land Use Element

The current General Plan land use designation in effect on the project site is 'Neighborhood/Community Commercial' which allows a broad range of commercial uses including: general merchandise sales, food and beverage sales, automotive uses, banks and financial services, administrative and professional offices, personal services, eating and drinking establishments, health clubs and spas, lodging and visitor services, and theaters, among other uses.

The Land Use Element of the General Plan includes the following objectives and policies on land use which are relevant to the project:

4.4.3 Commercial Land Uses

4.4.3.1 Commercial Land Use Objective. Provide conveniently located, efficient, and attractive commercial areas to serve regional, community, and neighborhood functions and meet the retail and commercial needs of Antioch residents and businesses.

4.4.3.2 Commercial Land Use Policies. The following policies apply to land designated for commercial uses on the General Plan land use map and by Focus Area policies.

- a. Design commercial and office developments in such a manner as to complement and not conflict with adjacent residential uses, and provide these developments with safe and easy vehicular, pedestrian, and bicycle access.

- e. Design internal roadways so that direct access is available to all structures visible from a particular parking area entrance in order to eliminate unnecessary vehicle travel, and to improve emergency response.

Community Image and Design Element

The relevant objectives and policies of the Community Image and Design Element are set forth in Section *II. A. Aesthetics*, under the heading ‘Regulatory Setting’.

Zoning Code

The entire project site is zoned “Planned Development District.” As set forth in Article 23 of the City of Antioch Zoning Code: “P-D Districts shall encourage the use of flexible development standards designed to appropriately integrate a project into its natural and/or man-made setting...” The P-D District provisions of the Zoning Code allow broad latitude in designation of permitted land uses and stipulate only that the development be in accordance with the General Plan and any applicable specific plan. Upon project approval, a site-specific P-D District is established which, along with the approved project development plan becomes, in effect, the zoning for the area within its boundaries, and includes a list of permitted uses, development standards, and architectural and landscaping guidelines. The Williamson Ranch Plaza Development Standards and the Williamson Ranch Plaza Sign Criteria, which were approved by City Council in 1998, govern the land uses and the form and appearance of development on the project site.

The City of Antioch Zoning Ordinance also includes a number of general provisions related to the enhancement of visual quality of development and the reduction or avoidance of aesthetic impacts and conflicts with adjacent uses. Most notable among these are the Sign Regulations (which minimizes obtrusiveness and promotes visual quality of signs), the Parking Requirements (which prohibit direct illumination of off-site areas by parking lot lighting, and require screening from adjacent streets with landscaping), screening requirements for mechanical equipment and outdoor storage, design guidelines for refuse storage areas, landscaping requirements and design standards, among other things.

Design Review

Under Article 26 of the City of Antioch Zoning Code all new development is subject to design review. The purpose of design review is to: “*promote the orderly and harmonious development of the city, the stability of land values and investments, and the general welfare and to encourage and promote the highest quality of design and site planning to delight the user and others who come in contact with uses and structures in the city*” (Zoning Code §9-5.2701(B)). Proposed projects are evaluated based on General Plan and Zoning design policies and criteria, with the goal of having new projects harmonize with the natural environment and the surrounding area.

Williamson Ranch Plaza Development Standards and Sign Criteria

The form and appearance of the planned expansion is further governed by the Williamson Ranch Plaza Development Standards and the Williamson Ranch Plaza Sign Criteria, both of which were approved by City Council in 1998.

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines Appendix G, the project would be considered to result in a significant land use and planning impact if it would:

- Physically divide an established community.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project.
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

[Note: Of the Appendix G checklist items listed above, only the second item is associated with potentially significant project impacts, which are addressed below. For the remaining checklist items, the initial scoping for this EIR determined that the project would result in no impacts or less-than-significant impacts with respect to these items. The determinations related to each of these items are discussed briefly in Section III. *Effects Found Not to Be Significant.*]

In addition, the City of Antioch also considers that a project would result in a significant land use impact if it would:

- Result in conflicts with existing land uses or planned developments in the vicinity.
- Result in an economic effect which is likely to ultimately result in a secondary land use impact such as physical deterioration or urban decay.

IMPACTS AND MITIGATIONS

Project-Specific Impacts

Impact H1. Consistency with General Plan and Zoning Ordinance. The planned expansion project is consistent with the provisions of the City of Antioch General Plan and Zoning Ordinance. (Less-than-Significant Impact)

General Plan

The planned expansion includes a mixture of uses, including grocery sales and general merchandise sales, all of which are allowed under the governing ‘Neighborhood/Community Commercial’ designation of the City of Antioch General Plan. As such, the planned expansion is consistent with the land use provisions of the General Plan. As shown in Table 8, the project is also consistent with the commercial land use policies of the General Plan that are applicable to the project.

**TABLE 8
PROJECT CONSISTENCY WITH GENERAL PLAN LAND USE POLICIES**

Policy No.	Policy Text	Project Consistency
Commercial Land Use Policy 4.4.3.2.(a)	Design commercial and office developments in such a manner as to complement and not conflict with adjacent residential uses, and provide these developments with safe and easy vehicular, pedestrian, and bicycle access	<u>Consistent:</u> East Antioch Creek provides a 100-foot wide buffer between the project and nearest residential uses to the north. Potential noise and lighting impacts of project would be reduced to less-than-significant levels through proposed project elements and mitigation measures. The project site plan provides for safe vehicular and pedestrian access and circulation, and provides access to adjacent bike lanes and provides on-site bicycle storage.
Commercial Land Use Policy 4.4.3.2.(e)	Design internal roadways so that direct access is available to all structures visible from a particular parking area entrance in order to eliminate unnecessary vehicle travel, and to improve emergency response	<u>Consistent:</u> The project site plan shows that the planned store expansion and the new parking area to west of the expanded store would be directly visible and accessible from main project entrance on Lone Tree Way.

Zoning

The planned Walmart expansion is consistent with the land use provisions of the P-D Zoning District covering the site, which permits grocery sales and general merchandise sales. The planned expansion will bring the total constructed floor area of Phase 1 and 2 of the Williamson Ranch Plaza to 221,626 square feet, which is within the maximum 245,100 square feet permitted under the P-D Zoning for the site. The planned expansion will be subject to the development standards, guidelines and criteria applicable to the site, as contained in the Williamson Ranch Plaza Development Standards and the Williamson Ranch Plaza Sign Criteria, which were approved by City Council in 1998. Therefore, the only Zoning Ordinance provisions which will be applied to the site will be the general provisions related to the enhancement of visual quality of development and the reduction or avoidance of aesthetic impacts and conflicts with adjacent uses. The consistency of the project with all of the applicable provisions pertaining to quality of the project design and its compatibility with neighboring land uses will be ensured through the City's design review process.

In summary, the proposed project will be consistent with all General Plan and zoning provisions applicable to the site.

Mitigation. **No mitigation required.**

Impact H2. **Land Use Compatibility.** **The project would constitute a change in land use within the planned expansion area; however, it would not result in significant conflicts or incompatibility with adjacent or nearby land uses. (Less-than-Significant Impact)**

The Walmart expansion project will involve development of approximately 3.7 acres of vacant land west of the existing store. The expansion site is flanked on three sides by existing commercial retail development, and the project would be compatible with those adjacent uses. The site is bounded on the north by the East Antioch Creek flood control channel which provides a transitional buffer with the existing residential neighborhood to the north.

The principal sources of conflicts between dissimilar adjacent land uses are aesthetics, lighting, and noise. The potential for the expansion project to result in such land use conflicts with the nearby residential neighborhood is discussed below.

The potential visual impacts of the project have been minimized through site planning and design features. In addition to the buffering provided by the intervening creek channel, the visibility of the loading, storage, and mechanical equipment areas at the rear of the planned building expansion will be minimized through the construction of an 8-foot high continuous screen wall along the northern project boundary. This will minimize potential land use conflicts due to visual and aesthetic concerns. (See Section II. A. *Aesthetics* for detailed discussion.)

Potential effects from night lighting of parking lots and buildings could produce unwanted light and glare. Potential lighting and glare impacts would be reduced by installing low-profile light standards (20-foot high), by using low wattage light fixtures, and by using cut-off shields to prevent direct illumination of adjacent properties. The potential for headlight glare and reflected glare from automobiles would be avoided along the north boundary by the screening effect of the 8-foot high masonry wall to be installed along the northern site boundary. In addition, the landscaping planned throughout the Walmart site and along the street frontages will effectively screen headlight and reflected glare from off-site locations. As such, the potential for land use conflicts due to lighting and glare will be minimized by the low-profile lighting and the screening elements planned to be incorporated into the project. (See Section II. A. *Aesthetics* for further discussion.)

The nearest existing residences to the north of the expansion area would be potentially subject to project operational noise generated by parking lot activity, delivery truck circulation and loading activity, mechanical equipment, trash compactors, and parking lot cleaning. As discussed in Section II. I. *Noise*, the potential noise impacts associated with these activities would be reduced to less-than-significant levels through a number of mitigation measures. These include: 1) design measures which are planned as part of the Walmart expansion (e.g., soundwalls along north site boundary and alongside the loading docks, trash compactors, and pallet and bale storage areas; solid masonry enclosures for refrigeration compressor units; rubber gasket seals for loading docks); 2) measures required as conditions of the original Use Permit approval (e.g., prohibition of nighttime loading and other activities along north side of building; restrictions on hours of parking lot cleaning in north portion of project); and 3) measures required by the City of Antioch subsequent to the approval of the original Use Permit (e.g., installation of truck fencing and gates at rear of store to enforce the nighttime loading prohibition; removal of metal storage containers from site). These measures would minimize potential land use conflicts due to operational noise generated by the expansion project. In addition, noise generated during the project construction period would be mitigated through a series of measures as identified in Section II. I. *Noise*.

In summary, the design elements and other measures to be incorporated into the expansion project would minimize the potential for land use conflicts, particularly with the nearby residences to the north. As such, the potential for the project to result in land use compatibility impacts is *less than significant*.

Mitigation. No mitigation required.

Impact H3. **Potential for Urban Decay Due to Economic Impacts.** The project would include a new grocery sales area, which would compete with existing supermarkets and grocery stores in Antioch, Brentwood and Oakley. The increased competition resulting from the project is not expected to cause or contribute to the closure of existing food stores in the area. As such, there is little or no potential for the project to initiate or contribute to a chain of events resulting in physical deterioration of properties, or urban decay. (Less-than-Significant Impact)

Background Discussion

Under CEQA, only direct and indirect physical effects of projects are to be considered. Section 15064(d) of the state CEQA Guidelines provides: “In evaluating the significance of the environmental effect of a project, the lead agency shall consider direct physical changes in the environment which are caused by and immediately related to the project.” Section 15064(d)(3) further states: “An indirect physical impact is to be considered only if that change is a reasonably foreseeable impact which may be caused by the project. A change which is speculative or unlikely to occur is not reasonably foreseeable.” In addition, CEQA requires that a determination that a project may have a significant environmental effect must be based on substantial evidence (CEQA Guidelines §15064(f)).

With respect to secondary economic effects of projects, Section 15131(a) of the CEQA Guidelines states: “Economic and social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.” In other words, economic and social changes are not, in themselves, considered under CEQA to be significant effects on the environment. In this context, the specific physical effect that could potentially occur as a result of a negative economic effect would be a physical deterioration of the built environment, or urban decay.

Definition of Urban Decay

The terms “physical deterioration” and “urban decay” are not clearly defined in the CEQA statute or Guidelines. However, for purposes of this EIR, the following definition was applied:

“Physical deterioration includes, but is not limited to, abnormally high business vacancies, abandoned buildings and commercial sites, boarded doors and windows, parked trucks and long term unauthorized use of properties and parking lots, extensive gang or offensive graffiti painted on buildings, dumping of refuse or overturned dumpsters on properties, dead trees or shrubbery and uncontrolled weed growth or homeless encampments.”

Evaluation of Competitive Effects of Supercenter Grocery Sales

The following discussion of potential economic and urban decay impacts is based on the *Retail Market Analysis for Proposed Walmart Expansion in Antioch, California*, prepared by Bay Area Economics (BAE) in July 2009. The BAE report is incorporated into this EIR by reference, as provided under CEQA Guidelines Section 15150. The full BAE report is attached as Appendix F to this EIR and its findings are summarized below.

Existing Conditions

The BAE report identifies the Primary Trade Area for the project as the cities of Antioch, Brentwood and Oakley. The Secondary Trade Area encompasses the cities of Pittsburg and Bay Point, and the unincorporated areas of East Contra Costa County.

As of the end of 2008, the total inventory of retail space in the Primary Trade Area (Antioch, Brentwood, and Oakley) was 3,934,920 square feet. This trade area was reported to have an overall vacancy rate of 7.9 percent, or 310,884 square feet of vacant retail space.

In its survey of existing retail space, BAE identified two recently vacated Mervyns stores in Antioch, and the now vacant Gottschalks in Somersville Mall. (The only vacant supermarket space is a former Save Mart located in the Secondary Trade Area in Pittsburg more than eight miles from the project site.) Most of the remaining vacancies are smaller spaces in projects scattered throughout the Primary Trade Area. With the exception of downtown Antioch, which consists largely of small storefronts, most of these small-store vacancies are actually in the newest centers in the area, some of which include plans for additional future development not yet underway. In other words, rather than being concentrated in older centers, the vacancies tend to be in the newest spaces, representing centers that are still undergoing initial absorption that has been slowed by the current recession. BAE's tour of these centers and observation of these vacant storefronts found that these centers were all still well-maintained, and even where construction had been halted mid-project, there were no signs of physical deterioration (e.g., broken windows, graffiti, or other markers for urban decay). Even vacant spaces in downtown Antioch are generally well-maintained.

Economic Impact/Urban Decay Analysis

The major component of the Walmart expansion will be the new grocery department, which will comprise a total of 39,815 square feet (27,146 s.f. sales floor, plus 7,875 grocery sales support area, plus 4,794 s.f. stockroom and ancillary). Since the Walmart expansion will result in no increase of floor area in any other sales category, such as general merchandise, only the potential effects of the proposed grocery sales area is evaluated below. (Note: Data on grocery sales are typically expressed in terms of overall supermarket floor area, including stockroom and ancillary functions not located on the sales floor. Therefore, in order to provide an analysis that treats the Walmart grocery component and the competitive supermarkets in a consistent manner, the floor area proposed for the Supercenter grocery department is expressed as a supermarket-equivalent area that includes the sales floor, support areas, the stockroom, and related ancillary areas (i.e., 39,815 square feet). [Note: For purposes of analyses, this number was rounded up to 40,000 square feet.]

The grocery area will be roughly equivalent in size to a modern conventional supermarket, which typically ranges in floor area from about 40,000 to 65,000 square feet in the Antioch/Brentwood/Oakley market area. However, the Supercenter will offer discount prices comparable to discount supermarkets such as WinCo, and thus will draw customers from a larger trade area than a conventional supermarket, which typically

II. Environmental Setting, Impacts, and Mitigation Measures
H. Land Use and Planning

provide for convenience shopping for residents in the surrounding neighborhoods. For purposes of this analysis, the primary trade area for the Walmart grocery sales component is expected to include the Cities of Antioch, Brentwood and Oakley. BAE has defined the secondary trade area as the portions of northeastern Contra Costa County which surround the primary trade area, including Bay Point and Pittsburg to the west, and the rural areas of eastern Contra Costa County to the south and east.

Existing grocery outlets within the defined trade area include 13 conventional supermarkets (e.g., 3 Safeways, 3 Raley's, 2 Luckys, 2 FoodMaxx, 2 Save Marts, 1 Grocery Outlet), 1 modern discount supermarket (WinCo), 2 older small-format community markets (2 CentroMarts), and 3 specialty food retailer (Trader Joe's, Smart & Final, and County Square Market). There are no known approved or pending projects which include grocery outlets within the trade area. Thus there are 19 grocery stores within the primary trade area which are considered direct competitors of the Supercenter. The total floor area of the 19 competitive food outlets within the primary trade area is approximately 857,199 square feet (as of March 2009). Based on an estimated aggregate sales of \$320 million for all 19 existing supermarkets, the average annual sales per square foot at the existing supermarkets is calculated to be \$367 per square foot.

It is estimated by BAE that the Walmart grocery department would generate sales of approximately \$500 per square foot, which would yield annual sales of approximately \$20 million. BAE estimates that in 2010, the addition of the Walmart grocery department would result in a reduction in average sales at existing supermarkets in the primary trade area to \$356 per square foot, a drop of 3 percent from 2008 levels. By 2015, average grocery sales would rise to \$386 per square foot (an increase of 5 percent over 2008 levels) assuming continuing general growth in demand. If it is assumed that growth in demand will remain flat for two years before climbing again, the average sales at existing supermarkets would drop 6 percent by 2010, and then rise to an increase of 2 percent over 2008 levels by 2015. This indicates that there could be a short-term impact to existing supermarkets of 3 to 6 percent in lost revenues in the short term, but that sales levels at these competitive stores would likely return to current levels by 2013 to 2015, and steadily increase thereafter, assuming no other competitive stores are opened within the primary trade area. The impacts to existing supermarkets in the secondary trade area would be relatively lower given the lower levels of demand that would be generated for the Walmart grocery sales at distances of six miles and greater from the store.

Based on the above discussion, the existing competitive food stores in the trade area could undergo average sales reductions of from 3 to 6 percent upon opening of the Supercenter, with the actual amount of average sales decline depending on which growth scenario is considered. The level of impact on individual competing supermarkets will vary depending on several factors, primarily location relative to the Supercenter, and price competitiveness, and also whether the competing store has a specialized niche like Trader Joe's or County Square Market (which specializes in Asian products). The conventional supermarkets nearest to the Supercenter may be the most affected. While this would indicate that the Lucky store one mile west on Lone Tree Way might be most vulnerable, it is BAE's conclusion that the Lucky store is unlikely to be subject to closure due to competition from the new Walmart grocery department alone. This conclusion is based on several factors. First, this Lucky store has performed better since it was taken over by Save Mart. Also, it is located in a newer center than some of the other stores in

the primary trade area, and it has better access to future residential growth areas to the east via Lone Tree Way and south via Deer Valley Road. Finally, the Lucky store management indicated to BAE that while they expected substantial lost sales to the Walmart grocery department, they did not believe the store was likely to close as a result.

In the unlikely event that an existing supermarket, such as the Lucky store, was to close, it could be retenanting by another supermarket or by a non-grocery user such as a dollar store or fitness club. BAE projects that there is ample retail demand to absorb a vacant supermarket space.

In summary, it is BAE's conclusion that no competing supermarkets in the primary or secondary trade areas are likely to close as a result of the proposed Walmart expansion. In the unlikely event that an existing supermarket were to close, such as the existing Lucky store, BAE indicates that the ample retail demand in the trade area would provide for retenanting of any such vacated space, when the project is considered on its own. Therefore, it is highly unlikely that the project would result in a prolonged vacancy which combined with other contributing factors would culminate in urban decay. Therefore, the indirect land use impacts resulting from potential economic effects of the project would be *less than significant*.

Mitigation. No mitigation required.

Cumulative Impacts

Impact H4. Cumulative Land Use Impacts. The proposed project combined with other cumulative projects would result in land use changes on their sites from vacant to urban uses. However, these changes would not combine to result in significant conflicts or incompatibility with adjacent or nearby land uses. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Land Use Impacts

Land use impacts tend to be localized and generally extend a short distance beyond project boundaries. Thus land use impacts at several project sites in the same general vicinity would not tend to accumulate to result in a greater level of land use impact. Although it is doubtful that land use impacts would extend very far beyond project boundaries, for purposes of this EIR the geographic scope of the cumulative analysis of land use impacts is defined to extend no more than one-half mile beyond the project. There are two cumulative projects within this radius – the final phase of the Lone Tree Landing commercial project to the east across Hillcrest Avenue, and the final phase of the Williamson Ranch Plaza to the west.

Cumulative Impact Analysis

In terms of consistency with plans, policies and regulations, the proposed project and the other cumulative projects will be required to conform to the City's General Plan, Zoning Ordinance, design review standards, and other development requirements. The City of Antioch General Plan EIR concludes that the land use impacts associated with the implementation of the General Plan would be less than significant. As such, the combined consistency impacts resulting from the project and the other cumulative projects described above will not be cumulatively significant.

The City of Antioch General Plan EIR states: "Implementation of General Plans throughout Contra Costa County, in combination with the proposed [General Plan] would result in extensive land use changes on the regional level. The projects [developed under the General Plans] would result in the development of thousands of acres of undeveloped land ..." Development under the Antioch General Plan "will result in the conversion of agricultural land and open lands to a variety of urban uses. The implementation of ...General Plan policies and mitigation measures help reduce the impacts resulting from conversion of open lands to urban uses, but the potential loss of such lands remains a significant unavoidable cumulative impact" (Antioch General Plan EIR, p. 5-5). While the conversion of thousands of acres of rural lands to urban uses represents a cumulatively significant impact on a regional basis, the development of a highly disturbed infill parcel of 3.7 acres for the proposed Walmart expansion is not considered cumulatively considerable. Specifically, the project site has little or no value as agricultural land since it has been substantially altered by previous grading activity and is too small to be an economical unit of agricultural production. The site has little or no value as open space since it consists of a small, featureless, vacant lot surrounded by commercial and residential development, and is disconnected from other open lands. Therefore, the development of the project site would result in a less than cumulatively considerable contribution to the cumulative loss of agricultural land and rural open space on a regional level.

In terms of general compatibility with surrounding land uses, the specific effects of the cumulative projects would be similar to those of the proposed project. Both cumulative projects are located along the south side of the East Antioch Creek flood control channel which provides a buffer from the single-family neighborhoods to the north in both instances. In addition, and as with the proposed project, the site plans and designs for both projects were subject to the City's General Plan policies, Zoning Code, design guidelines, and design review process through which potential adjacency impacts with neighboring land uses would have been reduced to less-than-significant levels at a project-specific level. This also applies to other cumulative projects, which would be subject to the same requirements. Therefore, the cumulative land use compatibility impacts would be *less than significant*.

Mitigation. No mitigation required.

Impact H5. Cumulative Urban Decay Impacts. The project, combined with the other cumulative commercial retail projects in the trade area, would potentially result in minor economic impacts to existing supermarkets over the short term. This increased competition is unlikely to result in the closure of any existing supermarkets. However, in the unlikely event that an existing supermarket was to close under cumulative conditions, it is very unlikely that such vacancy would initiate a series of events resulting ultimately in urban decay, primarily because the factors which would lead to urban decay – prolonged vacancy and lack of property maintenance – are unlikely to occur in the trade area. (Less-than-Significant Impact)

Geographic Scope of Analysis of Cumulative Urban Decay Impacts

The geographic scope of the analysis of cumulative urban decay impacts is defined by the Primary and Secondary Trade Areas for the project. As described under Impact H3, the primary trade area includes the Cities of Antioch, Brentwood and Oakley, and the secondary trade area includes the portions of northeastern Contra Costa County which surround the primary trade area, including Bay Point and Pittsburg to the west, and the rural areas of eastern Contra Costa County to the south and east. This area reflects natural geographic boundaries defined by landforms and water bodies which separate this area from the surrounding regions.

Analysis of Cumulative Urban Decay Impacts

There are three approved and pending small supermarket projects in the primary trade area and one in the secondary trade area. These include three Fresh & Easy Neighborhood Markets planned for Antioch and Brentwood. These projects include a total of 41,000 square feet of supermarket-equivalent space that will be added to the primary trade area. In the secondary trade area there is also a small 1,300 square expansion planned for the existing Foods Co. in Pittsburg.

With these additional stores in place, the net decrease in sales for existing supermarkets would be seven percent in 2010, and by 2015 sales would recover to slightly above current estimated levels. Under the Delayed Growth Scenario, the net sales decline in 2010 would be 11 percent, decreasing to a decline of only three percent in 2015. These sales declines are limited enough and short-term enough that it is unlikely that they could place an existing supermarket at risk of closure. Even if one supermarket were to close, its sales would then be redistributed among the remaining existing supermarkets, making additional closures unlikely.

With respect to individual store impacts, the effects of adding the limited square footage of the three Fresh & Easy outlets and the small Foods Co expansion would not be substantially different from the project-specific impact conclusions set forth in Impact H3. The three new stores are small, and being scattered throughout the area they should not substantially add to the potential proximity effects on stores near the Walmart (e.g., the Lucky), and are not specialized in the same market niche as existing supermarkets, so they should not impact stores in any particular market niche such that the additional cumulative impacts would be likely to result in the closure of any existing supermarket outlets.

The causal chain leading to urban decay is dependent on long-term vacancies resulting from store closures due to the entry of a new competitor into the market. Since the analysis above does not point to likely store closure, long-term vacancies and thus urban decay are also not likely to result from the Proposed Project, either alone or cumulatively with other reasonably foreseeable projects. However, in the unlikely event that an existing supermarket was to close, it is likely that any such space would be readily retenanted. This is primarily due to the fact that supermarket spaces are not only reusable by other grocers, they are also quite suitable and desirable for other retail users such as dollar stores, or non-retail users such as fitness centers. Since there is very little or no vacant supermarket-equivalent space in the trade area, there would be no competition from such space which might delay retenanting of a closed supermarket space. Additionally, in areas such as the Primary Trade Area where historic growth has been strong and where future growth potential is expected to remain strong once the economy recovers, there is a general expectation that higher-than-desirable vacancy rates will be temporary. Consequently, property owners are more likely to perceive the prospect of properties ultimately being leased at favorable rents, and thus are more likely to maintain their properties in a condition suitable for leasing or releasing. Therefore, the two major factors which can ultimately result in urban decay – prolonged vacancy and lack of property maintenance – cannot be concluded to be present or anticipated. As such, urban decay is not a reasonably foreseeable outcome even in the unlikely event of the closure of a supermarket.

There is also the related question of whether the project could exacerbate conditions for existing vacant spaces and thus contribute to factors which could result in urban decay related to such spaces. Certain non-grocery segments of the market show high vacancy and if all proposed and reasonably foreseeable retail projects were built, this might exacerbate the situation in the short term. However, as mentioned above, the vacancies in the Primary Trade Area are not in spaces suitable for a major competitive supermarket, and are thus not directly competitive with the supermarket retail sector in terms of building occupancy. In other words, the introduction of new supermarket space by Walmart would not delay or inhibit the tenanting or retenanting of existing non-supermarket size vacant space in the trade area because none of these spaces are suitable for another supermarket (which might theoretically be seeking to meet unmet grocery demand in the trade area). For example, the two largest vacancies, the vacated Mervyns stores in Antioch, are too large for a supermarket, and are in centers or retail nodes where such a use would be atypical (e.g., one vacated Mervyns store is in the Somersville Mall, an enclosed shopping mall where supermarkets are rarely if ever found). Most of the remaining vacancies are smaller spaces in projects scattered throughout the Primary Trade Area. With the exception of downtown Antioch, which consists largely of small storefronts, most of these small-store vacancies are actually in the newest centers in the area, some of which include plans for additional future development not yet underway. In other words, rather than being concentrated in older centers, the vacancies tend to be in the newest spaces, representing centers that are still undergoing initial absorption that has been slowed by the current recession. BAE's tour of these centers and observation of these vacant storefronts found that these centers were all still well-maintained, and even where construction had been halted mid-project, there were no signs of physical deterioration (e.g., broken windows, graffiti, or other markers for urban decay). Even vacant spaces in downtown Antioch are generally well-maintained. As mentioned above, in areas such as the Primary Trade Area where historic growth has been strong and where

future growth potential is expected to remain strong once the economy recovers, there is a general expectation that higher-than-desirable vacancy rates will be temporary. Consequently, property owners are more likely to perceive the prospect of properties ultimately being leased at favorable rents, and thus are more likely to maintain their properties such that urban decay is avoided. This is not to say that the retail climate in the area is not currently challenging, only that this project will not be a causal factor for urban decay, for the reasons discussed above.

In summary, it is BAE's conclusion that urban decay is not a foreseeable result of the proposed project, neither under project-specific conditions nor under cumulative conditions. The analysis shows that it is unlikely that the project would result in closures of competitive businesses resulting in building vacancies. In the unlikely event that such a vacancy was to occur, none of the other conditions which could ultimately lead to urban decay –prolonged vacancy and lack of property maintenance - are anticipated to occur. Additionally, it is unlikely that the project would contribute to the development of urban decay conditions at currently vacant properties. Given the lack of existing vacancies that would be suitable for a competing supermarket tenant, the introduction of the project to the trade area would not delay or inhibit the retenanting of larger or smaller existing vacant spaces that do exist. Despite the current unfavorable retail climate, the projected long term growth potential in the trade area is strong, and owners of vacant spaces (many of which are newly constructed) are maintaining their properties in a condition suitable for leasing with no sign of neglect or deferred maintenance. Therefore, there is no evidence to indicate that the project combined with the other small food stores planned for the trade areas would result in conditions ultimately leading to urban decay, or that it would exacerbate existing conditions that might lead to urban decay. As such, the cumulative urban decay impacts would be *less than significant*.

Mitigation. **No mitigation required.**

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II. Environmental Setting, Impacts, and Mitigation Measures
H. Land Use and Planning

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I. NOISE

BACKGROUND DISCUSSION

The IS/MND discussion of noise impacts was based on a previous noise report prepared by Illingworth & Rodkin in April 1998. That report identified several potential impacts related to effect of the project operational noise upon the nearby residential neighborhood across East Antioch Creek to the north. Several mitigation measures were identified which were subsequently included as conditions of project approval and implemented in conjunction with project development. One of these noise reduction measures included a prohibition on nighttime deliveries and other outdoor operational activities along the north side of the center between 10 PM and 7 AM. (Examples of outdoor operational activities include; truck circulation or engine starts or idling; operation or movement of forklifts, parking lot cleaners, or other mechanical or refrigeration equipment; depositing trash or recyclables in outside containers; trash collection or operation of trash compactors; moving pallets, cardboard bales, or other material; door slams, loud voices, loudspeakers, beepers, alarms, or any other noise sources. However, unloading of delivery trailers which have been backed up to the rubber gasket seals at the loading docks is permitted 24 hours per day because the exterior noise generated by such activity is minimal.) In a subsequent action, the City of Antioch required the installation of truck fencing and gates at the northeast and northwest corners of the Walmart building to physically enforce the prohibition on nighttime deliveries. In another action related to operational noise, the City required that all metal storage containers which had been temporarily stored on the Walmart site be removed, and this has been implemented.

In the time since the IS/MND was adopted in 1998, substantial changes have occurred in site conditions (including development of the existing Walmart store and most of the remainder of Williamson Ranch Plaza), as well as in the project noise environment. Therefore, the previous noise report by Illingworth & Rodkin is no longer considered valid in terms of its characterization of potential noise impacts and appropriate mitigations for the currently proposed project expansion. As such, an updated noise impact assessment was prepared by Illingworth & Rodkin in October 2009 in order to assess the planned expansion in terms of the current noise environment and regulatory context. The updated Illingworth & Rodkin report is incorporated into this EIR by reference, as provided under CEQA Guidelines Section 15150. The noise report is contained in Appendix G of this EIR, and its findings are summarized below.

ENVIRONMENTAL SETTING

Background Information on Acoustics and Noise Measurement

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing. On this scale, noise at zero decibels is barely audible, while noise at 120 to 140 decibels is painful and may cause hearing damage. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness.

Noise measurement equipment includes an electrical filter to reflect the fact that human hearing is less sensitive to low and very high frequencies than sound frequencies in the mid-range. The sound levels measured in this manner are called A-weighted sound levels and are typically expressed as dBA. (Unless otherwise noted, all noise levels indicated in this section are A-weighted.)

Since environmental sound levels vary over time, noise levels are described by various statistical noise descriptors that correspond to varying time periods. Thus the noise levels exceeded during 10 percent of the time are expressed as L_{10} , with noise levels exceeded 50 percent of the time expressed as L_{50} , and so on. The L_{eq} is the average A-weighted noise level during a specified period of time.

Since the sensitivity to noise increases during the evening and at night (because excessive noise interferes with the ability to sleep), 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level (CNEL)* is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 PM to 10:00 PM) noise levels and a 10 dB penalty added to nighttime (10:00 PM to 7:00 AM) noise levels. The *Day/Night Average Sound Level (L_{dn})* is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

For a detailed background discussion of environmental noise, including definitions of acoustical terms, see the noise study in Appendix G of this EIR.

Existing Noise Environment

The existing noise environment on the project site is typical of suburban areas. The predominant noise sources in the project vicinity are local traffic on Lone Tree Way and Hillcrest Avenue. Other noise sources include aircraft overflights and activities associated with the existing Walmart store on the site.

The nearest noise-sensitive receptors in the immediate project vicinity consist of single-family dwellings located approximately 100 feet north of the project site across the East Antioch Creek flood control channel. The primary noise source at the residential property line is traffic noise generated along Hillcrest Avenue. The existing Walmart loading dock area is located on the north side of the store and occasional loading dock activities are audible at the nearby residences. There is an existing 6-foot high soundwall along the southern residential property boundaries on the north side of creek channel, and an alternating 6- to 8-foot high soundwall along the eastern two-thirds of the Walmart north site boundary.

To quantify the existing ambient noise environment and noise levels generated by existing Walmart activities at the nearby residences, five noise level measurements (one long-term and four short-term measurements) were conducted by Illingworth & Rodkin in October 2008. Previously, an attended source measurement was made in June 2005 to quantify the noise levels generated by existing Walmart loading dock activities. The noise sources measured included traffic on Hillcrest Avenue, local residential activities (e.g., yard work, birds), and aircraft overflights, as well as truck delivery and loading dock activities at the rear of the existing Walmart store. Based on the noise measurements, the maximum hourly noise levels at the south side of the existing soundwall along the southern boundaries of the nearest residential properties are calculated to range from 48 dBA (nighttime hours) to 75 dBA L_{max} (heavy truck deliveries). It was estimated that the existing soundwall along the north side of the Walmart property provides approximately 8 dBA of noise reduction. The Walmart soundwall would provide slightly less attenuation for heavy truck movements, which may not be entirely shielded due to the increased noise source height (i.e., exhaust stack height). The residential sound wall provides additional attenuation for the residences, which is not reflected in the above noise levels. (See the noise report in Appendix G for a detailed discussion of noise measurement results.)

The existing Walmart store includes a public address (PA) system to inform customers of recovered personal items. Background music is sometimes played. The PA system is inaudible outside the main

store except in the outdoor garden area. A small speaker in the garden area plays PA announcements at conversational levels that are not audible beyond the garden area or nearby on-site parking and circulation areas. Walmart staff uses radios to communicate. The PA system does not contribute to community noise.

The existing noise levels at the nearest residences are primarily due to traffic along Hillcrest Avenue and local residential noise sources. Ambient noise levels at residences across the creek channel from the project are 55 dBA CNEL or less with shielding provided by residential structures and the existing sound walls. Noise levels at residences along Hillcrest Ave would be higher due to the proximity to the roadway. Noise levels generated by existing Walmart activities are below the City's threshold of 60 dBA CNEL for stationary and mobile noise sources at the nearest residential receptor locations.

REGULATORY SETTING

City of Antioch General Plan

The Environmental Hazards Element of the City of Antioch General Plan contains the following objective and policies on noise which are relevant to the project:

11.6.1 Noise Objective

Achieve and maintain exterior noise levels appropriate to planned land uses throughout Antioch, as described below:

- Residential
 - Single Family: 60 dBA CNEL within rear yards.
 - Multi-Family: 60 dBA CNEL within exterior open space.
- Commercial/Industrial: 70 dBA CNEL at the front setback.

11.6.2 Noise Policies

Noise Compatible Land Use and Circulation Patterns

- b. Maintain a pattern of land uses that separates noise-sensitive land uses from major noise sources to the extent possible, and guide noise-tolerant land uses into noisier portions of the Planning Area.

Noise Analysis and Mitigation

- e. When new development incorporating a potentially significant noise generator is proposed, require noise analyses to be prepared by a qualified acoustical engineer. Require the implementation of appropriate noise mitigation when the proposed project will cause new exceedances of General Plan noise objectives, or an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development.

- f. In reviewing noise impacts, utilize site design and architectural design features to the extent feasible to mitigate impacts on residential neighborhoods and other land uses that are sensitive to noise.
- g. Where feasible, require the use of noise barriers to reduce significant impacts.
 - The barrier must have sufficient mass to reduce noise transmission and high enough to shield the receptor from the noise source.
 - To be effective, the barrier needs to be constructed without cracks or openings.
 - The barrier must interrupt the line-of-sight between the noise source and the receptor.
 - The effects of noise “flanking” the noise barrier should be minimized by bending the end of the barrier back from the noise source.

Temporary Construction

- i. Ensure that construction activities are regulated as to hours of operation in order to avoid or mitigate noise impacts on adjacent noise-sensitive land uses.
- j. Require proposed development adjacent to occupied noise sensitive land uses to implement a construction-related noise mitigation plan. This plan would depict the location of construction equipment storage and maintenance areas, and document methods to be employed to minimize noise impacts on adjacent noise sensitive land uses.
- k. Require that all construction equipment utilize noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.
- m. Prior to the issuance of any grading plans, the City shall condition approval of subdivisions and non-residential development adjacent to any developed/occupied noise-sensitive land uses by requiring applicants to submit a construction-related noise mitigation plan for City review and approval. The plan should depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of the project through the use of such methods as:
 - The construction contractor shall use temporary noise-attenuation fences, where feasible to reduce construction noise impacts on adjacent noise sensitive land uses.
 - During all project site excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers’ standards. The construction contractor shall place all stationary construction equipment so that the emitted noise is directed away from sensitive receptors nearest the project site.
 - The construction contractor shall locate construction staging areas that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.
- n. The construction related noise mitigation plan required shall also specify that haul truck deliveries be subject to the same hours specified for construction equipment. Additionally, the plan shall denote any

construction traffic haul routes where heavy trucks would exceed 100 daily trips (counting both to and from the construction site). To the extent feasible, the plan shall denote haul routes that do not pass sensitive land uses or residential dwellings. Lastly, the noise mitigation plan shall incorporate any other restrictions imposed by the City.

City of Antioch Municipal Code

Section 5-17.05 of the Municipal Code sets forth the following restrictions on noise generated by construction activity, which is defined to include demolition and any other activity that can be heard from the perimeter of the parcel where the work is being performed:

- (B) It shall be unlawful for any person to be involved in construction activity during the hours specified below:
- (1) On weekdays prior to 7:00 a.m. and after 6:00 p.m.
 - (2) On weekdays within 300 feet of occupied dwellings, prior to 8:00 a.m. and after 5:00 p.m.
 - (3) On weekends and holidays, prior to 9:00 a.m. and after 5:00 p.m., irrespective of the distance from the occupied dwellings.

Zoning Ordinance

Section 9-5.1901 of the Antioch Municipal Code sets forth noise attenuation requirements for stationary and mobile noise sources. The provisions applicable to the project include the following:

- (A) *Stationary noise sources.* Uses adjacent to outdoor living areas (e.g., backyards for single-family homes and patios for multi-family units) and parks shall not cause an increase in background ambient noise which will exceed 60 CNEL.
- (B) *Mobile Noise Sources.*
- (1) Arterial and street traffic shall not cause an increase in background ambient noise which will exceed 60 CNEL.
- (D) *Noise Attenuation.* The City may require noise attenuation measures be incorporated into a project to obtain compliance with this section. Measures outlined in the noise policies of the General Plan should be utilized to mitigate noise to the maximum feasible extent.

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines, Appendix G, the project would be considered to have a significant noise impact if it would:

- Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies.

- Expose people to or generate excessive groundborne vibration or groundborne noise levels.
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For projects within an area covered by an airport land use plan or within two miles of a public airport or public use airport when such an airport land use plan has not been adopted, or within the vicinity of a private airstrip, expose people residing or working in the project area to excessive aircraft noise levels.
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

As noted above, the City of Antioch General Plan (Policy 11.6.2(e)) specifies that noise mitigation is to be provided “when the proposed project will cause new exceedances of General Plan noise objectives, or an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development.” For purposes of this analysis, these standards are applied as significance criteria.

[Note: Of the significance criteria listed above, only the first, third, and fourth items are associated with potentially significant project impacts, which are addressed below. For the remaining three checklist items, the initial scoping for this EIR determined that the project would result in no impacts or less-than-significant impacts with respect to these items. The determinations related to each of these items are discussed briefly in Section III. *Effects Found Not to Be Significant.*]

IMPACTS AND MITIGATION

Project-Specific Impacts

Impact II. Noise from Off-Site Traffic Sources. The project noise environment would be affected by off-site noise sources such as traffic on the adjacent roadways. (Less-than-Significant Impact)

It was calculated by Illingworth & Rodkin that the project site would be exposed to noise levels of up to 74 dBA CNEL, primarily generated by traffic on Hillcrest Avenue and Lone Tree Way, under cumulative conditions. These noise levels take into account the increased traffic volumes resulting from the development of other cumulative commercial and residential projects in the vicinity (for a full list of cumulative projects see Table 2 in Section I. *Project Description*). Areas of the site adjacent to these roadways would continue to be used for parking activities and would not be considered noise sensitive. At the setback of the planned building expansion, noise levels would be less than the 70 dBA CNEL noise threshold established for commercial uses in the General Plan, and thus would not exceed the City’s noise standards. Therefore, the noise impacts to the project would be *less than significant*.

Mitigation. No mitigation required.

Impact I2. **Project Traffic Noise.** Traffic generated by the project would increase noise levels along roadways in the vicinity. (Less-than-Significant Impact)

Existing traffic noise levels along nearby segments of Lone Tree Way and Hillcrest Avenue are 71 dBA CNEL and 68 dBA CNEL, respectively, at 50 feet from the centers of the nearest travel lanes. These noise levels are currently in excess of the City's noise level objectives of 60 dBA CNEL for outdoor use area of residential land uses and 70 dBA CNEL at the front setback lines of commercial uses. Based on the data in the traffic study, project traffic would result in noise level increases of approximately 0.1 dBA CNEL along the nearby segment of Hillcrest Avenue and 0.2 dBA CNEL along the nearby segment of Lone Tree Way. According to City General Plan Policy 11.6.2.(e), a noise impact will occur when the proposed project will cause new exceedances of General Plan noise objectives, or an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development. In this case the General Plan noise objectives are exceeded under existing conditions, and the noise level increase would be 0.1 to 0.2 dBA CNEL, which is far below the 3.0 dBA increase which would constitute an impact under the General Plan. (A 3 dBA increase is commonly accepted as the smallest increment of noise increase that humans typically are able to perceive.) The nearest existing noise sensitive residential uses in the project vicinity are located to the north across East Antioch Creek (see Figure 3). Traffic generated by the project would not result in a measurable or perceptible change in noise levels to these receptors, where the increase in traffic noise along Hillcrest Avenue from project trips would be far less than 1 dBA. Therefore, the noise impacts to the nearest residential uses and other land uses in the area due to project-generated traffic would be *less than significant*.

Mitigation. No mitigation required.

Impact I3. **Noise from Project Activity.** Noise generated by activity associated with the project would increase noise levels in the vicinity. (Less-than-Significant Impact)

The primary on-site noise sources associated with the Walmart Supercenter will include: (1) delivery truck activity, (2) loading dock activity, (3) parking lot activity, (4) rooftop mechanical equipment, (5) refrigeration condenser units, and (6) trash compactors. The potential noise impacts resulting from each of these project activities are discussed below.

The following discussion takes into account several noise reduction measures which are planned to be incorporated into the design of the Walmart expansion. These include the western extension of the existing 8-foot soundwall along the entire length of the northern site boundary, as well as the construction of new 10-foot high masonry walls alongside the existing and planned truck docks. In addition, the previous noise mitigations

the existing and planned truck docks. In addition, the previous noise mitigations identified in the 1998 IS/MND, which became conditions of approval for the original Use Permit, will be applicable to the expansion. These include a prohibition on nighttime loading and other activities along the north side of the center, as well as restricted hours for leaf blowing in the north portion of the project. Additionally, the further noise reduction measures which were subsequently required of Walmart by the City of Antioch will apply to the expansion project, including the use of truck fencing and gates to enforce the prohibition on nighttime loading, and the prohibition of temporary on-site storage of large metal shipping containers. All of the applicable operational noise reduction measures are set forth under Mitigation I3 below.

Delivery Truck Movements

Under existing conditions, the highest single-event noise levels generated by Walmart activities result from trucks circulating along the northern side of the retail center and the docking area. The existing store receives deliveries from an average of about 8 heavy duty 4-axle trucks and 7 light duty 2-axle trucks daily. For purposes of this analysis, it is assumed that the expansion would increase the total number of deliveries to up to 10 semi-trailer deliveries and up to 12 vendor truck deliveries per day. (Note: The increased delivery truck numbers are slightly higher than those indicated in the project description in order to present a worst-case analysis.) In addition, the new loading dock planned along the western side of the planned expansion would move activities closer to some residences located directly north of the expansion area. (Under existing conditions, the residences opposite the planned new loading docks are approximately 250 feet northwest of the existing loading docks at the northeast corner of the Walmart building. Upon completion of the planned expansion, those residences would be about 150 feet north of the new loading docks at the northwest corner of the expanded building.) (See Figures 3 and 5.) Although the number of deliveries would increase, noise levels generated during individual deliveries would be similar to existing delivery noise. Maximum instantaneous noise levels (designated L_{max}) generated by heavy trucks pulling into and out of the existing loading docks are typically 70 to 75 dBA L_{max} at the nearest residences and behind the Walmart sound wall. Low speed truck noise results from a combination of engine, exhaust, and tire noise and is not tonal in nature.

Most deliveries by vendor trucks would not occur at the recessed loading bays but rather at the delivery service doors located on the north wall between the two main loading docks. These service doors are located 155 feet from the nearest rear residential property lines to the north, and 175 feet from the nearest dwellings on those properties. The maximum noise levels generated by vendor trucks would range from 55 to 60 dBA L_{max} at the nearest residential property line.

In accordance with City requirements, delivery activity will continue to be prohibited from 10:00 PM to 7:00 AM, and the westerly fence and truck access gate will be relocated in conjunction with the building expansion to ensure compliance with the nighttime activities limits. The soundwall located along the northern property line of the Walmart site will be extended to the western property line. Although maximum noise levels generated during individual truck movements would temporarily increase ambient noise levels, these additional intermittent noise events would be similar to existing deliveries and would not typically cause speech interference during daytime hours (which

occurs at about 65 dBA under continuous noise conditions produced by roadway traffic) or cause a substantial increase in the overall noise levels. The implementation of planned sound reduction measures, as mentioned above and summarized in detail under Mitigation I3 below, would reduce the potential noise impacts resulting from increased truck deliveries associated with the planned expansion to a *less-than-significant* level.

Loading Dock Activities

Noise levels generated at the new truck dock during loading activities would be similar to existing levels generated during activities at the existing dock. The retail center is designed to allow heavy-duty trucks to back up to loading bays, with all loading and unloading taking place within the building. The existing truck docks are recessed into the ground about four feet and are equipped with rubberized gasket-type seals to reduce noise generated during loading activities. The use of rubber gaskets at the loading bay doors allows little loading noise to escape into the community. The new loading dock will also be recessed into the ground, and will include rubber gasket seals to contain loading noise. Based on field observations by Illingworth & Rodkin at similar facilities, it was noted that typical loading noise from trailers which have been backed up to rubber gasket seals is inaudible at a distance of 100 feet. Occasionally, noise generated within the trailer would be audible outside the trailer and would occasionally exceed the existing ambient noise levels. However, this noise would not substantially add to the existing noise environment given the sound attenuating effects of the masonry walls planned alongside the loading docks, the existing and planned soundwalls along the north site boundary, and the existing residential soundwall along East Antioch Creek across from the project.

The pallet and bale storage area would be relocated eastward from the current location in the northwest corner of the site. At the current location the pallet storage area is partially shielded by the existing masonry wall directly to the north, but is not shielded by a masonry wall to the west. At the proposed locations the relocated storage areas would be enclosed on the west, north and east sides by 10-foot high masonry walls, and would also be behind the existing 8-foot high soundwall. Noises from operations of the forklift and pallet stacking would average 55 to 61 dBA without screen walls, and this noise level would be reduced by 5-10 dBA because operations would occur behind the enclosure walls and soundwall. In addition, all such activities are prohibited between 10:00 pm and 7:00 am in accordance with the conditions of the original project approval for Walmart. Therefore, the maximum noise levels with screening would be 56 dBA, and average noise levels would be lower. These noise levels would not violate the City's noise ordinance, and would be well below the General Plan significance threshold of 60 dBA CNEL at the year yards of the nearest single-family residences. The noise levels associated with the pallet and bale storage areas would represent a *less than significant* impact.

The new loading dock at the northwest corner of the expanded Walmart would primarily receive deliveries for the new grocery department to be added to the store. Thus some deliveries would be by trucks with refrigeration units which would remain in operation while at the loading docks. Noise levels from trucks with refrigeration units were estimated by Illingworth & Rodkin under the following worst-case assumptions: the trucks would be diesel powered; the refrigeration units would operate only under the high power setting; the refrigeration unit on the truck would emit noise from the top of the unit; and the truck would be located along the northern property line of the site

(eliminating the benefit of noise shielding from the loading screen wall and the soundwall along Walmart's north property line). Under these worst-case assumptions (i.e., the trucks would be diesel powered; the units would operate only under the high power setting; the refrigeration unit on the truck would emit noise from the top of the unit (about 9 to 10 feet high); and the truck would be located along the northern property line of the site (eliminating the benefit of noise shielding from the wall along Walmart's north property line), the noise level is estimated to be 66 dBA at the nearest residential property line and 65 dBA at the nearest residential building. However, during unloading, the refrigeration trucks would actually be located in the new grocery loading docks, which would be set back from the northern property line by about 50 feet, recessed about 4.5 feet into the ground (at the loading door), and behind the 10-foot high loading dock walls (which would be equivalent to a 14.5-foot high wall at the lowest location at the receiving end of the loading ramp). Since the truck would be parked on an incline while at the loading dock, the front end of the trailer where the refrigeration unit is mounted would be about 3 feet below grade. Thus, the top of the refrigeration unit would be up to 7 feet above grade, about three feet below the height of the 10-foot high loading dock wall. Since the line-of-sight between the refrigeration unit and the nearest residences to the north would thus be broken, the noise shielding provided by the loading dock wall is calculated by Illingworth & Rodkin to provide a noise reduction of 6 dBA. Also, the additional 50 feet separating the loading dock from the nearest residences would provide an additional 3 dBA of noise reduction. Thus, the total noise reduction would be 9 dBA, with a resulting noise level of 57 dBA at the nearest residences. (It is likely that Walmart delivery trucks would be equipped with automatic ignition shut-off controls that would turn off the truck engine after three minutes of idling, thus further reducing noise during unloading of delivery trucks.) It is estimated that an average of 2 deliveries from refrigeration trucks would occur per day, that the trucks would each be unloading over a period of about one hour, and that the refrigeration cycle would turn on for 5 to 10 minutes approximately two times during each one-hour unloading period, totaling 20 to 40 cumulative minutes of noise per day, on average. These noise levels, which would occur during daytime hours only, would be within the State of California's Model Community Noise Ordinance (60 dBA for 15 to 30 minutes of noise during any daytime hour) and the City of Antioch's General Plan and Zoning Ordinance. Therefore, the addition of a new loading dock and the increase in loading activity resulting from the Walmart expansion would result in a *less-than-significant* noise impact.

Parking Lot Activities

Construction of the additional parking area to the west of the building expansion would increase the existing 742 parking spaces to 918 spaces, an increase of 176 spaces. Noise associated with the use of the parking lot would include vehicular circulation, loud engines, car alarms, squealing tires, door slams, and human voices. The maximum sound (L_{max}) of a passing car at 15 mph typically ranges from 40 to 50 dBA at 200 feet. The noise generated during an engine start is similar. Door slams generate lower noise levels. The hourly average noise level resulting from all of these noise-generating activities in a busy parking lot, without taking into account the shielding effect of soundwalls and the intervening building mass, could range from 35 dBA to 40 dBA L_{eq} at a distance of 200 feet from the parking area. (It should be noted that overnight parking by RVs is currently prohibited on the Walmart site, and will continue to be prohibited with the expanded Walmart. As such, overnight running of RVs or generators is not an issue.)

The nearest residences north of the project site are located between approximately 170 feet and 400 feet from the main portion of the new parking lot (with six of the planned new parking stalls located between 120 and 170 feet away). In addition to this distance separation, the nearest residences would also be shielded from parking lot noise by the planned 8-foot high sound barrier along the northern site boundary and the existing soundwall along the southern residential property lines across East Antioch Creek from the project site. The soundwalls would be constructed as specified in General Plan Noise Policy 11.6.2(g) (see 'Regulatory Context' above for full policy language).

Under existing conditions, parking lot noise associated with the Walmart store was observed (by Illingworth & Rodkin) to be inaudible at the nearby residences, although occasional loud events such as car alarms can be heard. Noise levels in the new parking lot would be similar to existing on-site parking lot noise. Existing parking areas at the northwest corner of the Walmart site are located 190 feet from the nearest residences, and existing parking areas along the rear of the adjacent OSH site to the west are 110 feet from the nearest residences across East Antioch Creek. Maximum instantaneous noise levels from vehicles in the nearest parking stalls would range from 45 to 55 dBA L_{max} at the nearest residential property line. Although the new Walmart parking area would locate parking stalls closer to some residents, parking lot noise would continue to typically fall below intermittent ambient noise levels that currently range from 55 to 65 dBA, and would not contribute to a substantial increase in background noise levels, especially with the extension of the planned sound wall westward along the northern Walmart property line. Therefore, the parking lot activities in the new parking area planned for the west side of the planned building expansion would result in a *less-than-significant* noise impact.

The parking area surface at Walmart shopping centers is periodically cleaned using small mechanical parking lot sweepers. The noise from this type of equipment was measured by Bollard Acoustical Consultants in 2007. It was determined that at a distance of 50 feet, the noise of the mechanical parking lot sweeper was 75 dBA L_{max} . Such equipment could be operated throughout the primary parking areas south of the Walmart without resulting in noise impacts because of the distance separating these activities from residential receivers and the shielding provided by the Walmart building itself. However, in the expanded parking area to the west of the Walmart building, sweepers could operate as close as 100 feet from the nearest residences to the north. The operation of a sweeper truck at this distance would generate maximum noise levels up to 63 dBA L_{max} assuming the shielding provided by the 8-foot high masonry block wall proposed along the north property line of the Walmart site. This activity would be of short duration (lasting less than a few minutes in proximity to the north site boundary) and average daily noise levels due to sweeping activities would not exceed the City of Antioch's 60 dBA CNEL threshold. The maximum noise levels generated by sweeping trucks would be below ambient maximum noise levels experienced at the nearest residential receivers and therefore would result in a *less-than-significant* noise impact.

Rooftop Mechanical Equipment

Rooftop mounted mechanical equipment would include heating, ventilating, and air conditioning equipment. Noise generated by such equipment varies significantly

depending on the equipment type and size. Noise impacts would depend on system design level specifications including the equipment location, type, size, capacity, and enclosure design. These details are typically not available until later phases of the project design and development review process.

Noise levels generated by existing Walmart rooftop equipment were not measured during the noise monitoring survey because levels were indistinguishable from traffic noise at the northern property line of the site. Project rooftop equipment would likely be similar to existing equipment. Based on measurements of rooftop equipment at similar commercial centers and large supermarkets in the region, noise levels of 60 to 70 dBA at a distance of 15 feet could be expected. Due to the shielding from the roof and the increase in distance, noise levels at the property line of the nearest residences would be expected to be less than 45 dBA. As observed for the existing equipment, noise levels generated by project equipment would generally be indistinguishable above the ambient noise environment. Given that existing project mitigation measures require acoustical analysis of planned mechanical equipment (see Mitigation Measure 13 below), with the requirement that noise from mechanical equipment shall not exceed 45 dBA L_{eq} in the nearest residential backyards, the noise levels generated from this source will result in a *less-than-significant* impact.

Refrigeration Condenser Units

The expansion project would include two refrigeration compressor units along the western façade of the expanded building. Based on manufacturer specifications, these units are approximately 16 feet long by 8 to 9 feet tall by 8 feet wide. Each individual compressor unit would generate noise levels ranging from 64 to 73 dBA at a distance of 50 feet from the unit, depending on the receiver location and orientation relative to the unit. With both compressors running simultaneously, unmitigated noise levels would range from 67 to 76 dBA at a distance of 50 feet from the units.

The units are proposed to be enclosed by metal fencing and would be located about 230 feet from the nearest residences to the north. The nearest residences would be shielded from condenser noise by the two sound walls (Walmart's and the existing residential soundwall along the north bank of the creek). Without taking this shielding into account, the compressors would generate noise levels of about 54 to 63 dBA at the location of the nearest residence. The acoustical shielding would provide a total of about 5 dBA of noise reduction within the residential rear yards. Assuming the condensing units run continuously for an hour, noise levels are calculated to exceed existing measured levels by up to 18 dBA L_{eq} during the nighttime and 10 dBA L_{eq} during the daytime in the nearest residential rear yards. The amount of time the units would operate over a 24-hour period is not known. If the units operated for 8 hours during the daytime and 4 hours during the nighttime, the CNEL in the nearest residential rear yards is calculated to be 61 dBA. If continuous 24-hour operation is assumed, the CNEL is calculated to be 64 dBA. Under existing conditions, the CNEL in the nearest residential rear yards is 55 dBA. The noise levels resulting from operation of the compressor units would substantially exceed the existing ambient levels during the daytime and the nighttime, and the CNEL would exceed the City's 60 dBA noise threshold for residential uses, as established in General Plan Policy 11.6.2(e) and Zoning Ordinance section 9-5.1901. Therefore, the increased noise levels resulting from the compressor units would constitute a *significant* impact.

Trash Compactors

The project also includes two trash compactors to be located along the north façade (the existing compactor near the northwest corner of the building would be relocated to the east, and a new compactor would be installed on the north side of the new loading dock). Trash compactors typically generate maximum noise levels of 40 to 50 dBA at 150 feet, depending on the power rating and enclosure characteristics. Primarily due to shielding provided by the 8-foot high screen walls planned along the north sides of the trash compactors, and to a lesser degree the two existing sound walls, maximum noise levels generated at the adjacent residences by the new trash compactors would be 45 dBA or less and would generally be below ambient daytime noise levels at the nearest residences. As indicated in the list of noise reduction measures to be implemented for the project expansion, listed under Mitigation I3 below, trash compactor operations would be prohibited between the hours of 10:00 pm and 7:00 am and thus would not generate noise during nighttime hours. Given the noise shielding elements included in the design of the planned expansion, in addition to the prohibition on nighttime operational activities on the north side of the store (currently in effect), the addition of a trash compactor as part of the expansion project would result a *less-than-significant* noise impact.

Public Address System

As noted in ‘Environmental Setting,’ the Public Address (PA) system at the existing Walmart store is inaudible beyond the site boundaries and does not contribute to community noise. Since no changes are planned for the PA system, no new noise impacts are anticipated from this source.

Mitigation I3. The following is a comprehensive list of measures required to reduce project-generated noise to less-than-significant levels. These measures are either: 1) design measures included in the planned project expansion; 2) conditions of approval from the original project approval which are applicable to the planned expansion; 3) City of Antioch requirements established subsequent to the original project approval; or 4) measures newly identified in this EIR. The origin of each noise reduction measure is noted parenthetically at the end of each measure. Some of the listed measures have been modified slightly from their original form to provide greater specificity or clarity, but without changing the meaning or intent of the measure. Since almost all of the listed measures are planned to be incorporated into the project as planned design measures or as previously required mitigations, they are listed below mainly for information and reference purposes. (Note: The time limitations specified below also apply during the holiday shopping season when the store may be open for extended hours.)

- **All outdoor operational activities shall be prohibited on the north and west sides of the center including but not limited to loading and unloading, delivery truck engine idling or starts, operation of refrigeration/condenser equipment, operation of trash compactors, pallet or bale moving or handling, and any other staff activity, between the hours of 10:00 PM and 7:00 AM. (However, with the installation of rubber gasket seals on the loading doors, as specified below,**

trailers which have been properly backed up against the loading door gaskets may be unloaded at any time of the day or night since any interior loading noise would be effectively attenuated by the rubber gaskets.) Trucks arriving on-site during these 'quiet hours' shall park in front of the building and not on the side or behind the store. Signs shall be posted at the rear of the property identifying the quiet hours and prohibition of activities during this time. (Condition of original project approval.)

- Rubber gasket seals shall be installed at the new truck dock to reduce noise generated during loading activities. (Condition of original project approval.)
- The truck gates along the north side of the Walmart building shall be closed between the hours of 10:00 PM and 7:00 AM to prohibit vehicular access to the rear of the building during these hours. The existing westerly truck fence and gate shall be relocated further to the west in conjunction with the building expansion. (City requirement established subsequent to original project approval; design measure included in the planned project expansion.)
- The planned trash compactor on the north side of the building expansion shall be screened with an 8-foot high masonry block wall. (Design measure included in the planned project expansion.)
- The planned trash compactor on the north side of the building expansion shall be enclosed with fencing and a locked gate to prevent access by store employees or garbage trucks between the hours of 10:00 PM and 7:00 AM. In addition, signage shall be prominently posted near the trash compactor areas providing notice that no garbage pickup is to occur during these designated nighttime hours. (Newly identified in this EIR.)
- All delivery trucks, garbage trucks, and other service vehicles of any kind shall be prohibited from parking near the rear or sides of the Walmart store between the hours of 10:00 PM and 7:00 AM. Signs shall be prominently posted which provide notice to all truck drivers arriving on the site during these nighttime hours to park at the front of the store. In addition, the Walmart store management shall make every effort to directly notify all truck drivers of this requirement. (Newly identified in this EIR.)
- All areas on the site which are designated for storage of cargo pallets or cardboard/plastic bales shall be individually enclosed on the west, north and east sides by 10-foot high masonry block wall. (Design measure included in the planned project expansion.)
- All areas on the site which are designated for storage of cargo pallets or cardboard bales shall be individually fenced and gated to prevent access between the hours of 10:00 pm and 7:00 am. Pallets and cardboard/plastic bales shall be stacked no higher than eight feet. (Newly identified in this EIR.)

- **The existing 8-foot high soundwall, which runs along the northern property line of the site, shall be extended westward to the west site boundary. (Design measure included in the planned project expansion.)**
- **A 10-foot high sound wall shall be constructed along the north side of the existing loading dock near the northeast corner of the building and along the north side of the planned new loading dock at the northwest corner of the expanded building. (Design measure included in the planned project expansion.)**
- **Metal storage containers shall not be kept on-site. All truck trailers brought to the site shall be dropped at the loading docks and empty trailers shall be removed from the loading docks and the site after unloading. (City requirement established subsequent to original project approval.)**
- **Leaf blowers and store cleaning operations shall be prohibited north of the retail building within the project boundary between the hours of 8:00 PM and 7:00 AM. (Condition of original project approval.)**
- **Prior to the issuance of building permits, the applicant shall submit engineering and acoustical specifications for project mechanical equipment demonstrating that the equipment design (types, location, enclosure specifications) will control noise from the equipment such that noise levels shall not exceed 45 dBA L_{eq} at the nearest residential backyards. (Condition of original project approval.)**
- **Refrigeration/condenser units shall be enclosed along the north and west walls by solid concrete block walls with the wall height exceeding the final height of the equipment by three foot or more. A minimum of 50 percent of the interior sides of the enclosure walls shall be covered with acoustically absorptive material. Openings to the enclosure structure shall be configured to face away from the nearest residences. The specification for the refrigeration/condenser units shall specify a maximum noise level rating of 65 dBA at a distance of 50 feet. (Newly identified in this EIR.)**
- **Walmart shall designate a “noise disturbance coordinator” who will be responsible for responding to any local complaints about on-site operational noise. The disturbance coordinator would determine the cause of the noise complaint and institute reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted in the bulletin board area at the store entrance. (Newly identified in this EIR.)**

Significance after Mitigation. Less-than-Significant Impact.

Impact I4. Construction Noise. Noise-generating activities associated with the construction of the expansion project would temporarily elevate noise levels at nearby noise-sensitive receptors. (Potentially Significant Impact)

Construction activities are anticipated to take place over a period of 9 months including 1 month for demolition and grading, 7 months for construction, and 1 month for exterior improvements. Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise generating activities, and the distance between construction noise sources and noise-sensitive areas. Noise levels from construction equipment are shown in Table 9 on the next page.

Construction noise impacts primarily result when: 1) construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours); 2) the construction occurs in areas immediately adjoining noise-sensitive land uses; or 3) when construction lasts over extended periods of time.

Noise generated by construction would be the greatest during site grading activities and excavation for underground utilities. Site preparation and grading is anticipated to occur over approximately 1 month, and underground utility construction is anticipated to take approximately 6 weeks. Pile driving will not be employed as a construction method. Typical maximum noise levels from demolition, excavation, and grading activities range from 70 to 90 dBA at a distance of 50 feet from the source. The typical range of noise levels at 50 feet during active construction of the building expansion would be about 65 to 85 dBA.

The nearest noise-sensitive receivers are located 100 feet or further from the expansion area and would be shielded by an existing six-foot high sound wall along the south boundary of the nearest residential properties. Most construction activities would occur at distances of several hundred feet or further from these nearby residences as most construction activity would not occur in the northern portion of the site (i.e., about 75 percent of the expansion area is located at least 250 feet south of the nearest existing residences). During the site grading and excavation construction phases, the noise generated by construction activity would be the greatest to the nearest noise-sensitive land uses. Typical maximum noise levels experienced at the nearest residences from construction activities would range from 60 to 80 dBA when construction activities take place in the northern portion of the site, with the highest noise levels taking place over the first three months of construction. Noise levels would decrease with distance away from residences. Construction activities are not anticipated to extend past one construction season and would not be located in proximity to a particular receptor during the entire construction period.

In conclusion, noise generated by construction would create a temporary noise impact on adjacent noise-sensitive receptors, and this would represent a *significant short-term impact* prior to the implementation of mitigation measures.

TABLE 9
CONSTRUCTION EQUIPMENT – NOISE EMISSION LEVELS (AT 50 FEET)

Equipment Category	L_{max} Level (dBA)^{1,2}	Impact or Continuous
Arc Welder	73	Continuous
Auger Drill Rig	85	Continuous
Backhoe	80	Continuous
Bar Bender	80	Continuous
Boring Jack Power Unit	80	Continuous
Chain Saw	85	Continuous
Compressor ³	70	Continuous
Compressor (other)	80	Continuous
Concrete Mixer	85	Continuous
Concrete Pump	82	Continuous
Concrete Saw	90	Continuous
Concrete Vibrator	80	Continuous
Crane	85	Continuous
Dozer	85	Continuous
Excavator	85	Continuous
Front End Loader	80	Continuous
Generator	82	Continuous
Generator (25 KVA or less)	70	Continuous
Gradall	85	Continuous
Grader	85	Continuous
Grinder Saw	85	Continuous
Horizontal Boring Hydro Jack	80	Continuous
Hydra Break Ram	90	Impact
Impact Pile Driver	105	Impact
Insitu Soil Sampling Rig	84	Continuous
Jackhammer	85	Impact
Mounted Impact Hammer (hoe ram)	90	Impact
Paver	85	Continuous
Pneumatic Tools	85	Continuous
Pumps	77	Continuous
Rock Drill	85	Continuous
Scraper	85	Continuous
Slurry Trenching Machine	82	Continuous
Soil Mix Drill Rig	80	Continuous
Street Sweeper	80	Continuous
Tractor	84	Continuous
Truck (dump, delivery)	84	Continuous
Vacuum Excavator Truck (vac-truck)	85	Continuous
Vibratory Compactor	80	Continuous
Vibratory Pile Driver	95	Continuous
All other equipment with engines larger than 5 HP	85	Continuous

Notes:

¹ Measured at 50 feet from the construction equipment, with a “slow” (1 sec.) time constant.

² Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

³ Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

Source: Illingworth & Rodkin

Mitigation I4. The following is the list of measures required to reduce project construction noise to less-than-significant levels. These measures are divided into the following two categories: 1) Measures required as conditions of the original project approval; 2) Measures newly identified in this EIR, based on policies contained in the City of Antioch General Plan.

Mitigations Required with Original Project Approval

[Note: In some instances the language of the original measure has been modified slightly for greater specificity or clarity, without changing the intent or meaning of the original measure.]

- Noise-generating construction activities, including truck traffic coming to and from the site for any purpose, shall be limited to weekdays between 8:00 AM to 5:00 PM, or as approved by the City Engineer.
- All equipment driven by internal combustion engines shall be equipped with mufflers which are in good condition and appropriate for the equipment.
- The construction contractor shall utilize “quiet” models of air compressors and other stationary noise sources where the technology exists.
- At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from noise-sensitive receptors.
- Unnecessary idling of internal combustion engines shall be prohibited.
- Owners and occupants of residential and non-residential properties located within 300 feet of the construction site shall be notified of the construction schedule in writing.
- The construction contractor shall designate a “noise disturbance coordinator” who will be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and institute reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site.

Mitigations Newly Identified in this EIR

The following mitigation measures are based on the noise policies of the City of Antioch General Plan. The applicable General Plan policy number is indicated following each mitigation measure.

- **Prior to the issuance of any grading permits, the applicant shall submit a construction-related noise mitigation plan for City review and approval. The plan shall depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of the project through the use of such methods as:**
 - **The use of temporary noise-attenuation fences, where feasible, to reduce construction noise impacts on adjacent noise sensitive land uses;**
 - **Placement of all stationary construction equipment so that the emitted noise is directed away from sensitive receptors nearest the project site;**
 - **Establishment of construction staging areas at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction. (GP Noise Policy 11.6.2m.)**
- **The required construction-related noise mitigation plan shall also specify that haul truck deliveries be subject to the same hours specified for operation of construction equipment. (GP Noise Policy 11.6.2n.) (Note: Haul trucks and construction vehicles and equipment will be largely confined to Lone Tree Way since no heavy trucks are allowed on Hillcrest Avenue.)**

Significance after Mitigation. Less-than-Significant Impact.

Construction activities are not anticipated to extend past one construction season and would not typically be located adjacent to a particular receptor continuously during the entire construction period. Given also that standard noise control measures would be implemented, as required per conditions of the original project approval and by General Plan policy, the noise generated by the construction activity would not result in significant adverse impacts. Therefore, the impact would be *less-than-significant* with mitigation.

Cumulative Impacts

Impact 15. Cumulative Noise Impacts. The noise generated by project sources, combined with noise from other cumulative projects, would not result in a cumulatively significant noise impact. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Noise Impact Analysis

Noise impacts tend to be relatively localized and generally do not extend beyond several hundred feet from the noise source. The impacts from noise generated within the project site would be confined to the adjacent and nearby properties. Noise impacts from project-generated traffic would extend out from the project site along the main roadways serving the site, and would diminish with distance from the project.

Cumulative Impact Analysis

As discussed above under Impact I2, the traffic generated by the project would result in noise level increases of about 0.1 and 0.2 dBA along the nearby segments of Hillcrest Avenue and Lone Tree Way, respectively. These increases would be well below the 3.0 dBA increase established as significant in the General Plan in cases where existing noise levels already exceed the General Plan standards, as is the case here. Specifically, for the sensitive residential uses along Hillcrest Avenue and Lone Tree Way, the applicable standard is 60 dBA while the existing noise levels are 68 dBA and 71 dBA CNEL, respectively. Therefore, the applicable noise standards are exceeded along both roadways under existing conditions.

Since the effects of noise are highly localized, cumulative noise impacts could occur if there are other projects in the immediate vicinity of the project which collectively result in increases in ambient noise levels. In this case, the added effects of traffic from other cumulative projects would increase noise levels along nearby roadways. Based on data from the traffic report, it was calculated by Illingworth & Rodkin that cumulative noise levels along the affected roadways would increase by 0.9 dBA CNEL along nearby segment of Hillcrest Avenue and by 1.5 dBA CNEL along the nearby segment of Lone Tree Way, relative to existing conditions. These noise level increases would be less than the General Plan noise increase criterion of 3 dBA discussed above. (Noise increases of less than 3 dBA are generally not detectable by human hearing.) Therefore, the cumulative noise impacts due to increased traffic on affected roadways would be less than significant.

With respect to project operations, the potential noise impacts generated at the project site would be less than significant or would be reduced to less-than-significant levels through mitigation measures to be incorporated into the project, as identified under Mitigation I3 above. The operational noise generated by the other cumulative projects would not combine with the operational noise from the project to produce cumulatively noticeable or substantial noise because they are too far away from the project site, and they are separated from the project site by noisy major streets and/or intervening buildings. The only pending projects in the immediate vicinity are the final phase of the Lone Tree Landing Shopping Center project located northeast of the Hillcrest Avenue/Lone Tree Way intersection, and the final phase of the Williamson Ranch Plaza to the west of the expansion area. Those project phases are located approximately 1,000 feet east and 1,500 feet west, respectively, from those residences on the north side of East Antioch Creek which would be subject to incremental operational noise from the Walmart expansion. Due to these distance separations as well as the intervening sound walls and building masses, any operational noise from the final phases of these projects would not be audible at these residential locations. As such, the cumulative noise impacts resulting from operational activities of the planned Walmart expansion, combined with those associated with the final phases of the Lone Tree Landing and Williamson Ranch Plaza projects, would be *less than significant*.

Similarly, in the unlikely event that construction of the Walmart expansion occurred at the same time as construction of the final phases of the Lone Tree Landing and Williamson Ranch Plaza projects, the same factors discussed above for operational noise would minimize the potential for cumulatively significant construction noise. In addition, the other two projects in the vicinity would be subject to the same noise ordinance restrictions on hours of construction, and would also be subject to similar noise mitigations as those

identified for the proposed project under Mitigation I4 above. Therefore, the cumulative construction noise impacts would be less than significant.

In summary, the cumulative noise impacts associated with the construction and operation of the Walmart expansion and the other cumulative projects would be *less than significant*.

Mitigation I5. No mitigation required.

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J. PUBLIC SERVICES

This section provides an updated description of existing conditions and potential impacts to fire and police protection services, and solid waste collection and disposal service. This discussion is based on information contained in City documents and obtained from the respective service providers. It should be noted that although there are no significant changes in circumstances to public services since the original IS/MND was approved in 1998, the following is nevertheless provided to update this discussion.

It should also be noted that certain public services, such as schools and recreation, for which the project was found not to result in significant impacts in the 1998 IS/MND, are excluded from the following discussion. (See also Section IV. *Effects Found Not to be Significant.*)

ENVIRONMENTAL SETTING

Fire Protection Services

Fire protection and emergency services are provided to the project site by the Contra Costa Fire Protection District (with support from the East Contra Costa Fire Protection District). The District operates four fire stations within the City of Antioch, each with a minimum of three personnel per engine company on duty at all times. The primary facilities serving the site are Fire Station 88, located 1.6 miles north on Folsom Street near Hillcrest Avenue, and Station 82 located 2.5 miles northwest at Lone Tree Way and Bluerock Drive. The third responding engine company would come from Brentwood Station 52 (in the East Contra Costa Fire Protection District) located 3.5 miles south on John Muir Parkway near the SR-4 Bypass.

The District's response times for the first two engine companies due on scene would be within the City's response time goal of five minutes from receipt of the call. All firefighters are licensed Emergency Medical Technicians (EMTs) who are trained to provide basic emergency medical services. (Approximately 76 percent of all calls received by the Fire District involve medical emergencies.) The District staff is also trained to respond to hazardous materials incidents.

Police Protection Services

Law enforcement services for the project site are provided by the City of Antioch Police Department from its headquarters at 300 L Street. The Police Department currently has an authorized staff level of 123 sworn and 20 non-sworn personnel and 37 active volunteers. The Department's staffing levels are maintained to fall within the range of 1.2 to 1.5 officers per 1,000 population, in accordance with General Plan performance standards. The Department divides the City into six "beats" for purposes of patrol, and the project site is located in Beat 6 which covers the southeast portion of the City (south of Highway 4 and east of Hillcrest/Deer Valley). Responses to emergency calls are handled by officers on patrol within each beat, and the response time for priority calls is currently within the City's eight minute response-time goal.

The California Highway Patrol (CHP) provides law enforcement and traffic safety services on State Routes 4 and 160, and is available to assist the Antioch Police Department during emergencies when requested.

The Contra Costa County Sheriff's Department provides law enforcement services to the rural and unincorporated areas of the County, and also provides contract services to the City of Oakley from its station located in downtown Oakley. The Sheriff's Department also has primary responsibility for patrolling the County Fairgrounds located west of downtown Antioch, and also responds to requests for mutual aid from the City of Antioch Police Department.

Solid Waste

Solid waste collection and disposal service in Antioch is provided by Allied Waste Services of Contra Costa County (formerly known as Pleasant Hill Bayshore Disposal), which also collects recyclables and yard waste. Allied also contracts with commercial customers to provide recycling bins and pick-up services. Solid waste and recyclables are hauled to a transfer station in Martinez where recyclables are separated out and solid waste is transferred to the Keller Canyon Landfill in Pittsburg. Green waste is chipped and used as alternative daily cover for the landfill. The landfill has a permitted maximum disposal of 3,500 tons per day, and average daily disposal in 2007 was about 2,566 tons, or 73 percent of the permitted volume. The landfill is permitted to operate through 2030.

REGULATORY SETTING

State

California Integrated Waste Management Act

In 1989, the legislature enacted the Integrated Waste Management Act (AB 939), which required all California cities and counties to implement programs to reduce landfill tonnage by 25 percent by the end of 1995, and 50 percent by the end of 2000, through source reduction, recycling and composting. In 2006 (the latest year for which data is available), the diversion rate for the City of Antioch was 55 percent.

City of Antioch General Plan

The City of Antioch General Plan contains the following objectives, policies and performance standards for fire protection, police services, and solid waste which are relevant to the project:

Growth Management Element

3.5.2 Fire Protection Facilities

3.5.2.1 Performance Objective. Maintain competent and efficient fire prevention and emergency fire, medical, and hazardous materials response services with first responder capability in order to minimize risks to life and property.

3.5.2.2 Performance Standard. Prior to approval of discretionary development projects, require written verification from the Contra Costa County Fire Protection District that a five minute response time (including three minute running time) can be maintained for 80 percent of emergency fire, medical, and hazardous materials calls on a citywide response area basis.

3.5.3 Police Service

3.5.3.1 Performance Objective. Maintain an active police force, while developing programs and police facilities that are designed to enhance public safety and protect the citizens of Antioch by providing an average response time to emergency calls of between seven and eight minutes from the time the call is received to the time the officer arrives.

3.5.3.2 Performance Standard. Maintain a force level within a range of 1.2 to 1.5 officers, including community service officers assigned to community policing and prisoner custody details, per 1,000 population. The ratio of community service officers assigned to community policing and prisoner custody details to sworn officers shall not exceed 20 percent of the total number of sworn officers.

Public Services and Facilities Element

8.6.1 Solid Waste Management Objective. Reduce the amount of solid waste requiring disposal at landfills, enhancing the potential for recycling of the City's solid wastes.

8.6.2 Solid Waste Management Policies

- a. Require provision of attractive, convenient recycling bins and trash enclosures in residential and non-residential development.
- d. Require builders to incorporate interior and exterior storage areas for recyclables into new commercial, industrial, and public buildings.
- j. The City shall require all development projects to coordinate with appropriate departments and/or agencies to ensure that there is adequate waste disposal capacity to meet the waste disposal requirements of the project, and the City shall recommend that all development projects incorporate measures to promote waste reduction, reuse, recycling, and composting.

8.10.1 Fire Protection Objective. Provision of adequate number of fire stations, along with fire fighting personnel and equipment to protect Antioch residents and businesses.

8.10.2 Fire Protection Policies

- a. Work with the Contra Costa County Fire Protection District to provide high quality fire protection services to area residents and businesses. The City's role should include but not be limited to the following:
 - Enforcement of building codes to reduce fire hazards;
 - Collection of mitigation fees established by the fire district to construct needed additional stations within the Antioch Planning Area;
 - Support the District in establishing fees that are adequate to mitigate the impacts of new development and income to support operation of new stations whose construction is financed with development fees; and

- Requiring reasonable reservation of appropriate sites for new fire stations as part of new development.

8.11.1 Police Services Objective. Reduce the risk of crime and provide security to Antioch residents and businesses through maintenance of an adequate force of police personnel, physical planning strategies, and a high level of public awareness and support for crime prevention.

8.11.2 Police Services Policies

- c. Provide basic requirements and incentives for the provision of design features in new development to reduce the potential for crime.
 - Provide well-lighted and visible streets and street names, entrances, addresses, recreation areas, and parking areas.
 - Limit access into and between buildings to reduce escape routes and undetected entry is made difficult.
 - Provide landscaping which permits surveillance of open areas and entryways, and does not create places for concealment.
- d. Involve the Antioch Police Department in the development review process by referring development requests to the Police Department for review and comment.

Antioch Municipal Code

Chapter 3 of the Municipal Code requires all commercial operations to segregate recyclables and greenwaste for collection and disposal. In addition, Article II of the Code requires that all projects valued at greater than \$75,000 shall provide for the recycling of at least 50 percent of the waste construction and demolition materials.

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines, Appendix G, the project would be considered to result in a significant public services impact if it would:

- 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 following public services:
 - i) Fire protection;
 - ii) Police protection;

- iii) Schools;
 - iv) Parks;
 - v) Other public facilities.
- Not be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.
 - Not comply with federal, state, and local statutes and regulations related to solid waste.

[Note: Of the significance criteria listed above, all but the items related to schools, parks, and other public facilities are associated with potentially significant impacts, which are addressed below. For the remaining checklist items, the initial scoping for this EIR determined that the project would result in no impacts or less-than-significant impacts with respect to these items. The determinations related to each of these items are discussed briefly in Section III. *Effects Found Not To Be Significant.*]

IMPACTS AND MITIGATION

Project-Specific Impacts

Impact J1. Fire, Police, and Solid Waste. The project would increase the need for fire and police protection services, as well as the demand for solid waste collection and disposal service; however, these increased demands would not degrade service levels or result in the need for new or altered facilities for any of these services. (Less-than-Significant Impact)

Fire Protection

The calls originating from the project would primarily involve medical emergencies, and to a lesser extent suppression of structure fires. The Fire District currently responds to approximately 20 calls per year from the existing Walmart store, the vast majority of which are for medical emergencies. With the expansion of the Walmart, calls from the project are expected to increase. According to Chris Souter of the Fire District, the District has adequate staff and equipment to serve the project, and would be able to respond to emergency calls from the site within the five-minute response-time goal of the City. In addition, Mr. Souter indicated that providing service to the project would not compromise the District's ability to provide adequate services to other parts the City within its response time goals. He added that the District certainly has existing capacity to provide that additional service with minimal impact on operations. In addition, the implementation of City policies and requirements related to payment of mitigation fees will provide for the incremental expansion of staff, facilities, and equipment to continually meet fire protection performance objectives as the City grows.

The project would be constructed in accordance with the fire protection requirements of the California Building Code. The code requires that the planned expansion be designed and built to include fire alarms, sprinklers, extinguishers, hydrants, adequate water

supply, fire walls, and other fire protection measures. The Fire District and the City's Building Inspection Services Division would review the expansion plans to ensure compliance with all code requirements.

Based on the above discussion, the project's impact on fire protection services would be *less than significant*.

Police Protection

The most frequent incidents requiring police involvement at the project would likely be shoplifting and traffic incidents in the parking lot. The Department currently responds to an average of five calls per week from the existing Walmart store. Walmart has a security staff which handles pre-processing for most shoplifting cases, which saves the Police Department considerable time in processing these cases. With the expansion of the Walmart, calls from the project are expected to increase in proportion to customer traffic.

According to Police Captain Allan Cantando, the Antioch Police Department has adequate staff and equipment to respond to increased frequency of emergency calls that would be generated by the expansion project. In addition, Captain Cantando indicated that the project would not compromise the Police Department's ability to respond to emergency calls in other parts of the City while maintaining response time standards, either upon project opening or in the future (see Impact J2 below for a discussion of cumulative impacts to public services).

The project applicant has indicated that Walmart will implement the following security measures in its operation of the expanded store:

- Conduct a risk analysis (crime survey) of the area to evaluate the security needs for the store and implement a security plan based upon this analysis.
- Install closed-circuit camera systems (surveillance cameras) inside and outside the store. Digital recording cameras will be used that have scanning and recording capabilities. The cameras used on the exterior of the building will be able to monitor the entire perimeter of the store.
- Establish a parking lot patrol for the Walmart store area, which patrol assists customers, ensures safety and takes action to identify and prevent any suspicious activity (such as loitering and vandalism) during hours of operation. The patrol will be available to escort those shoppers who want assistance going to their vehicles. It will have an electric cart or scooter to patrol the parking area and the area behind the store.
- Establish a Risk Control Team, which is a team of associates responsible and trained to identify and correct safety and security issues at the site. The Risk Control Team will be on duty during hours of operation. The Risk Control Team will patrol the inside the store to ensure safety and security. The lead patrol officer will have a phone/device to notify law enforcement quickly of problems at the store.
- Train cashiers to oversee self checkout lines to ensure a smooth checkout process and to prevent minors from making unlawful purchases.
- Provide lighting in the parking area that will ensure public safety.

- Prohibit consumption of alcohol in the Walmart parking lot by having associates regularly “patrol” the parking area while collecting shopping carts, and report any inappropriate activity to the store manager. (Also, per state law, alcohol sales will be limited to the hours of 6AM to 2AM of the following day.)

The Police Department would also be involved in development review process for the project to ensure that crime prevention measures are included in the project design. These measures may include security alarms, surveillance equipment, security guards, adequate lighting for parking lots and walkways, and landscaping and building design to eliminate potential crime areas.

Based on the above discussion, the project’s impact on police services would be *less than significant*.

Solid Waste

Since the western wall and much of the southern wall of the existing Walmart store and a small portion of the parking area will be demolished and removed, a minor quantity of demolition debris will be generated during the construction phase. Once the project is complete and operational, the expanded facility will generate incrementally greater volumes of solid waste on a daily basis than is generated under existing conditions. The solid waste impacts of the project during both the construction and operational phases are discussed in turn below.

Construction/Demolition Phase

The demolition will generate various materials including concrete, metals, wood, gypsum, and other building materials. It is estimated that demolition materials will include approximately 480 cubic yards (cy) of building material, plus about 974 cy of asphaltic concrete, and 30 cy of landscape debris. The City of Antioch requires that projects valued at greater than \$75,000 divert 50 percent of the waste generated through recycling and reuse. Materials recyclers in the area who would accept the demolition material include FTG Construction in Antioch and Gallagher & Burke in Oakland. Allied Waste Services also accepts construction and demolition debris, which is diverted for recycling and reuse at its Martinez transfer station. Debris which is diverted by Allied would be counted toward the project’s 50 percent diversion requirement.

Operational Phase

Once the project is completed, the expansion area will increase the quantity of solid waste generated by the Walmart store. Based on solid waste generation data compiled by the California Integrated Waste Management Board, the generation rates applicable to the project are 5.9 lb/100 square feet per day for the grocery sales area, and 3.12 lb/100 square feet per day for the general merchandise and other retail/service functions. By applying these generation rates, the supermarket-equivalent area would generate 2,349 pounds of additional solid waste per day (i.e., 5.9 lb/100 s.f. times 39,815 s.f.), and because the general merchandise and other retail/service functions would be reduced in overall floor area by 6,240 square feet, they would generate 195 fewer pounds of solid waste per day (i.e., 3.12 lb per 100 s.f. times 6,240 s.f.), for a net incremental solid waste

generation of 2,154 pounds (or 1.1 tons) per day. In addition, landscape trimmings will produce greenwaste. If it is assumed that all of this waste would be landfilled, this amount would represent about 0.1 percent (i.e., 1/1,000th) of the remaining daily capacity of approximately 964 tons of solid waste allowed to be received by the Keller Canyon Landfill. A substantial portion of the solid waste generated by the project is expected to be diverted from the waste stream through recycling, as discussed below, so the project contribution to the landfill would actually be far lower than the above estimate. This increment of solid waste contributed by the project would not appreciably shorten the remaining life of the landfill. Thus, although the additional solid waste generated by the project would increase demand for disposal, the project's impact on remaining landfill capacity would be *less than significant*.

Recyclable materials, including greenwaste, generated by the expansion project would be picked up by Allied Waste Services as part of its service to the existing Walmart store. (Greenwaste is not composted but is used as alternative daily cover at the Keller Canyon Landfill.) Used cardboard and plastic generated at the planned expansion will be picked up by a private recycling company, as occurs under the existing Walmart operation. Similarly, used shipping pallets will be picked up by Walmart trucks, as is the current practice. Waste oil from the Tire and Lube Express would continue to be picked up under contract to an oil recycling company.

The project itself is not likely to necessitate an expansion of staff or equipment by Allied Waste Services. The addition of staff and equipment would occur incrementally as needed and would be fully financed from fees generated by new customers.

Based on the above discussion, the project's impact on the solid waste collection service would be *less than significant*.

Mitigation. No mitigation required.

Cumulative Impacts

Impact J2. Cumulative Public Services Impacts. The increased demands for police and fire services, and solid waste collection and disposal services resulting from the cumulative projects in the project vicinity will likely require additional staff and equipment but are not expected to require the construction of new or expanded facilities. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Public Services Impacts

Police and fire services are provided on an area basis. The southeast Antioch area is located in police Beat 6, which is bounded on the west by Deer Valley Road and on the north by SR 4, and extends up to 2.3 miles from the project site. Fire services are provided by the Contra Costa Fire District from three fire stations located in southeast Antioch and western Brentwood, which are located from 1.6 miles to 3.5 miles from the project site. The list of cumulative projects listed in Table 2 includes projects within an approximate three to four

mile radius of the project site. The area encompassed by the cumulative project list is considered to be the study area for the cumulative analysis of police and fire services. Since Solid waste collection services are provided on a City-wide basis, the Antioch city boundaries are considered the limits of the cumulative analysis for solid waste.

Cumulative Impact Analysis

The proposed project and the other cumulative development projects would result in incremental increases in demand for police and fire protection services. According to representatives of the Antioch Police Department and the Contra Costa Fire Protection District, the increased demands for police and fire services would be met by augmenting staff and equipment on an ongoing basis as needed to maintain service standards. The increased service capacities would be funded through property tax and sales tax revenues generated by each development project, as well as development impact fees as applicable. Thus the cumulative projects are not expected to result in cumulatively significant impacts to police or fire services. It is not expected that increased service demands from cumulative development would necessitate the construction of new facilities or physical expansion of existing facilities. If such facility improvements are needed, the potential environmental impacts associated with their construction would be subject to environmental review on a project-specific basis for each facility, which would provide for mitigation of any identified impacts. As such, the cumulative impacts to police and fire services would be *less than significant*.

With respect to solid waste collection, the increased service demands from the project and other cumulative projects would be met through incremental increases in staff and equipment, which would be funded through fees for service. Likewise, the landfill serving the City is expected to remain in service for 22 years, and thus has sufficient capacity to accept the incremental solid waste generated by the cumulative projects. Therefore, the cumulative impacts to solid waste collection and disposal service would be *less than significant*.

In summary, the cumulative impacts to public services would be *less than significant*.

Mitigation. **No mitigation required.**

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K. TRAFFIC AND CIRCULATION

BACKGROUND DISCUSSION

The traffic impacts associated with the original Walmart project were evaluated in the previous IS/MND in conjunction with the entitlement approvals for the Williamson Ranch Plaza Phases 1 and 2 which were granted by the City of Antioch in 1998. In the several years since the original traffic study was prepared, the conditions in the project area have changed considerably. These changes include substantial additional development which has occurred in southeast Antioch and the adjacent areas of Brentwood, as well as numerous improvements to the transportation network, most notably the completion of the State Route 4 Bypass to the east of the project. As such, an updated traffic analysis was prepared by Kimley-Horn and Associates which evaluates the potential effects of the Walmart expansion project in the context of the current land use pattern and transportation system.

The following is a summary of the traffic impact analysis prepared by Kimley-Horn in November 2009. The traffic report is incorporated into this EIR by reference, as provided under CEQA Guidelines Section 15150. The traffic report is summarized below and contained in Appendix H of this EIR.

ENVIRONMENTAL SETTING

Existing Roadway System

Roadways that provide primary circulation in the vicinity of the project site are described below in alphabetical order and shown in Figure 10.

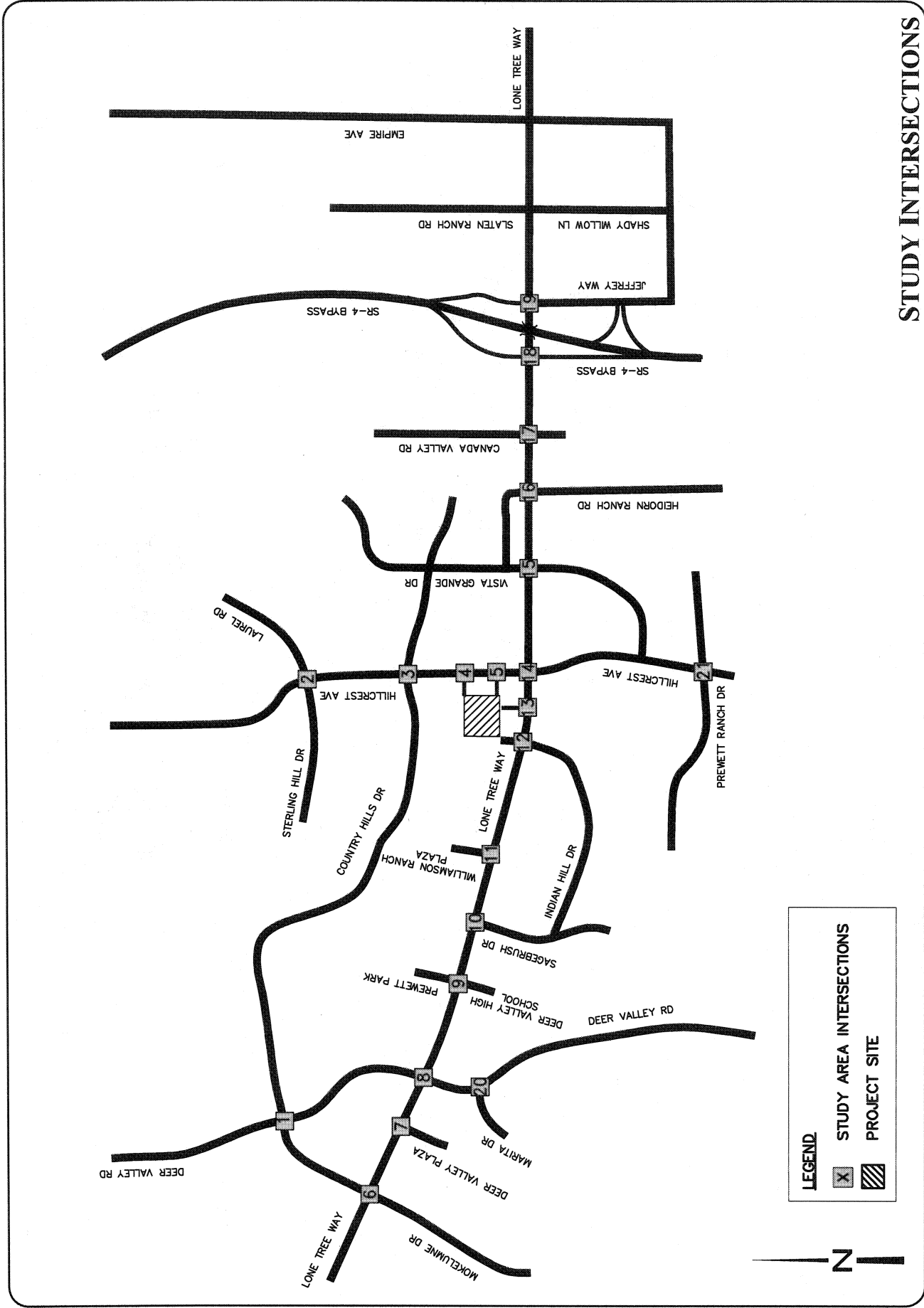
Canada Valley Road: This is a two-lane roadway with turn lanes serving residential areas north of Lone Tree Way. The street limit is 40 mph. South of Lone Tree Way, the street serves the Arcadia development in Brentwood which includes the Home Depot store.

Country Hills Drive: This is a two-lane roadway with turn lanes at major intersections. East of Hillcrest Avenue the street has a landscaped median. The speed limit on Country Hills Drive is 25 mph. South of Lone Tree Way the street changes name to Mokelumne Drive.

Deer Valley Plaza: This is the access driveway to Deer Valley Plaza.

Deer Valley Road: This is a four-lane divided roadway with a landscaped median, left turn bays, wide shoulders, and restricted parking. Shoulders are designated as Class II bike lanes. The speed limit on Deer Valley Road is posted at 45 mph in the project vicinity. Deer Valley Road is designated as a Route of Regional Significance.

Heidorn Ranch Road: South of Lone Tree Way, this is currently a four-lane divided roadway with a landscaped median, left turn lanes, and restricted parking from Lone Tree Way to the EBMUD aqueduct. South of the new development area, Heidorn Ranch Road narrows down to two lanes. North of Lone Tree Way, Heidorn Ranch Road is currently a divided two-lane roadway. The speed limit on Heidorn Ranch Road is 25 mph north of Lone Tree Way and 45 mph south of Lone Tree Way.



STUDY INTERSECTIONS
FIGURE 10

SOURCE: KIMLEY-HORN AND ASSOCIATES

Hillcrest Avenue: This is a four-lane divided roadway with a landscaped median, left turn bays, wide shoulders, and restricted parking. Shoulders are designated as Class II bike lanes. The speed limit on Hillcrest Avenue is posted at 45 mph in the project vicinity. Hillcrest Avenue is designated as a Route of Regional Significance north of Lone Tree Way.

Indian Hill Drive: This is a two-lane residential street with turn lanes at major intersections. The speed limit on Indian Hill Drive is 25 mph. An access drive to the Williamson Ranch Plaza is opposite Indian Hill Drive where it intersects Lone Tree Way.

Jeffery Way: This is a two-lane street with a speed limit of 35 mph. Jeffery Way is connected to the northbound ramps for the SR-4 Bypass.

Laurel Road: This is a four-lane divided roadway with a landscaped median and turn lanes at major intersections. Shoulders are designated as Class II bike lanes. The speed limit on Laurel Road is 45 mph in the project vicinity. In the future, Laurel Road will be extended to the east to connect with the completed interchange at Laurel Road and the SR-4 Bypass which provides a connection to Laurel Road in Oakley. On the west side of Hillcrest Avenue the street name changes to Sterling Hill Drive.

Lone Tree Way: This is an arterial roadway that that connects Antioch with the City of Brentwood. Through the project area, Lone Tree Way is a four- to six-lane divided roadway with a landscaped median, left turn bays, and restricted parking. The speed limit on Lone Tree Way is posted at 45 mph in the project vicinity. Lone Tree Way is designated as a Route of Regional Significance.

Prewett Park: This is the access for Prewett Family Park. Opposite the park entrance is the primary access for the Deer Valley High School.

Sagebrush Drive: This is a two-lane street with turn lanes at major intersections. The speed limit on Sagebrush Drive is 25 mph.

State Route 4 (SR-4) Bypass: The SR-4 Bypass is a new roadway extending from the existing SR-4 in Antioch southward and eastward to Vasco Road in Brentwood. The Bypass is a two-lane expressway between Lone Tree Way and Balfour Road in Brentwood, and a four or six-lane freeway between Lone Tree Way and SR-4 in east Antioch. The segment from Lone Tree Way to SR-4 was opened in 2007.

Vista Grande Drive: This is a two-lane street with turn lanes at major intersections. The speed limit on Vista Grande is 25 mph.

Williamson Ranch Plaza: This is the westerly project entry driveway from Lone Tree Way to Williamson Ranch Plaza.

Intersection Level of Service

Contra Costa County Measure C established a sales tax to be used to fund transportation improvements in the County. The passage of Contra Costa County Measure J in 2004 extended the previous Measure C program to 2034. The measure includes a growth management program and requires Contra Costa Transportation Authority (CCTA) to develop a comprehensive transportation plan and update it every other year. To receive a share of the sales tax generated by Measure J, local jurisdictions must adhere to the level of service (LOS) standards that Measure J applies to routes of regional significance. Each jurisdiction must take appropriate action to ensure that the LOS standards are met on designated routes of regional significance, which include all the freeways and State highways, and the most significant arterials in Contra Costa County. The CCTA classifies several streets in the project study area as routes of regional significance, including Lone Tree Way, Deer Valley Road, and Hillcrest Avenue (north of Lone Tree Way). As such, intersections along the routes require analysis utilizing CCTA Technical Procedures. The CCTA standards apply only to designated routes of regional significance.

Levels of service are represented by a letter scale from LOS A to LOS F, with LOS A representing the best performance and LOS F representing the poorest performance under significantly congested conditions. According to the CCTA requirements, LOS D (i.e., v/c up to 0.85) is an acceptable level of traffic operation at intersections on the routes of regional significance in the study area. Furthermore, intersections to be evaluated under CCTA requirements include signalized intersections that are expected to be affected by 50 or more project trips in a peak period.

In addition, the CCTA and its Regional Transportation Planning Committees have also set various standards in order to measure effectiveness on specific roadways, called Traffic Service Objectives (TSOs). In the study area, the delay index on routes of regional significance should be less than 2.0. That is to say the ratio of congested travel time vs. uncongested travel time along the corridor should be less than 2.0 during the AM peak as well as during the PM peak period.

For streets not designated as regionally significant, local standards apply. The City of Antioch General Plan states that where feasible, signalized intersections along design arterial roadways will strive to maintain a “High D” level of service (v/c – 0.85-0.89) within regional commercial areas and at intersections within 1,000 feet of a freeway interchange. (For clarification, it should be noted that the level of service definitions shown in Table 4 are used by both the City of Antioch and CCTA. However, the City of Antioch Level of Service standard for intersections is “High D” (v/c 0.85 – 0.89) while the CCTA Level of Service standard is LOS “D” (maximum v/c 0.85) which is applied to routes of regional significance.) (Note: Among the study intersection listed subsequently, only the Prewett Ranch Drive/Hillcrest Avenue intersection is not on a route of regional significance, i.e., Hillcrest Avenue is not a route of regional significance south of Lone Tree Way.)

Unsignalized intersections are not specifically covered in the CCTA or General Plan requirements; however, in harmony with the intent of the General Plan, the Kimley-Horn traffic study considered a “High D” level of service (LOS) to be an acceptable level of operation at unsignalized intersections. Unsignalized intersections were evaluated using *Highway Capacity Manual* methodology which bases LOS on average delay per vehicle.

Definitions of levels of service for signalized and unsignalized intersections are provided in Table 10.

TABLE 10
CITY OF ANTIOCH AND CCTA INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Signalized (Intersection volume to capacity ratio v/c)	Unsignalized (Avg. control delay per vehicle sec/veh)
A	Free flow with no delays. Users are virtually unaffected by others in the traffic stream	≤ 0.6	≤ 10
B	Stable traffic. Traffic flows smoothly with few delays.	0.61 – 0.70	>10 – 15
C	Stable flow but the operation of individual users becomes affected by other vehicles. Modest delays.	0.71 – 0.80	>15 – 25
D	Approaching unstable flow. Operation of individual users becomes significantly affected by other vehicles. Delays may be more than one cycle during peak hours.	0.81 – 0.90	>25 – 35
E	Unstable flow with operating conditions at or near the capacity level. Long delays and vehicle queuing.	0.91 – 1.00	>35 – 50
F	Forced or breakdown flow that causes reduced capacity. Stop and go traffic conditions. Excessive long delays and vehicle queuing.	> 1.00	> 50

Sources: Contra Costa Transportation Authority Technical Procedures 1997 and Transportation Research Board, *Highway Capacity Manual 2000*, National Research Council, 2000.

Existing Level of Service Conditions

The 21 intersections which were studied to establish existing level of service conditions in the vicinity of the project site are listed below, and their locations are shown in Figure 9: These intersections were selected for analysis based on the criteria of the Contra Costa Transportation Authority's (CCTA) traffic impact study guidelines which provide that analysis "should include any signalized intersection to which at least 50 project trips would be added" during the analysis periods (i.e., peak hours). To be conservative, some intersections that have much lower traffic levels were also included in the traffic study.

1. Country Hills Drive/Deer Valley Road
2. Laurel Road/Hillcrest Avenue
3. Country Hills Drive/Hillcrest Avenue

4. Northeast Walmart Driveway/Hillcrest Avenue
5. Southeast Walmart Driveway/Hillcrest Avenue
6. Lone Tree Way/Country Hills Drive
7. Lone Tree Way/Deer Valley Plaza
8. Lone Tree Way/Deer Valley Road
9. Lone Tree Way/Prewett Park
10. Lone Tree Way/Sagebrush Drive
11. Lone Tree Way/Williamson Ranch Plaza
12. Lone Tree Way/Indian Hill Drive
13. Lone Tree Way/Walmart Driveway
14. Lone Tree Way/Hillcrest Avenue
15. Lone Tree Way/Vista Grande Drive
16. Lone Tree Way/Heidorn Ranch Road
17. Lone Tree Way/Canada Valley Road
18. Lone Tree Way/SR-4 Bypass
19. Lone Tree Way/Jeffery Way
20. Marita Drive/Deer Valley Road
21. Prewett Ranch Drive/Hillcrest Avenue

Existing traffic conditions at the study intersections were established through traffic counts collected in May 2008. The counts were conducted during the AM (7:00 to 9:00 AM) and PM (4:00 to 6:00 PM) peak periods of the weekday. Traffic counts were taken on days when local schools were in session and outside of holiday periods. (See the traffic study in Appendix H for traffic count data.)

City practice regarding the preparation of traffic impact studies is to limit analysis to weekdays. For this reason, and because no long-term weekend forecast data is available, no analysis of weekend traffic conditions was undertaken.

The evaluation of existing levels of service at the study intersections indicated that all of the signalized and unsignalized intersections operate at acceptable level of service B or better during both the AM and PM peak hours. (See the traffic study in Appendix H for detailed calculations.)

Transit System

Tri-Delta Transit provides bus service in Antioch. Routes 380, 385 and 392 pass directly adjacent to the project site, connect to the Hillcrest park-and-ride and the Bay Point BART station in Pittsburg, and provide convenient connections to many locations in the city and connections to other local and regional transit routes. There are transit stops at the following locations adjacent to the project site:

- South side of Lone Tree Way, 200 feet west of Indian Hill Drive. Amenities include a bus turnout and a bench.
- South side of Lone Tree Way, 200 feet east of Hillcrest Avenue. Amenities include a bus turnout and a bench.
- North side of Lone Tree Way, 300 feet west of Hillcrest Avenue along frontage of Williamson Ranch Plaza. Amenities include a bus turnout and a shelter.
- On east side of Hillcrest Avenue, 200 feet north of Lone Tree Way. Other than a bus stop sign, no amenities are provided at this location.

Transit serving the site operates on a frequency of 30 to 60 minutes during the weekday and 60 minutes on the weekend.

Bicycle and Pedestrian Systems

Sidewalks are present on Lone Tree Way and Hillcrest Avenue adjacent and near the project site. Sidewalks provide walking facilities between the Walmart, nearby transit stops, and the adjacent residential neighborhoods. From the existing store there are paved walkways to both Hillcrest Avenue and Lone Tree Way where the transit stops are located. The walkways permit pedestrians to reach the bus stops without having to walk in the parking lot or drive aisles of the site.

There is a Class I paved bike trail across the Lone Tree Way frontage of the Williamson Ranch Plaza in the East Bay Municipal Utilities District (EBMUD) easement. Class II bike lanes are present on both sides of Hillcrest Avenue adjacent and near the project site. Class II facilities are in place on nearby roadways including Laurel Road, Country Hills Drive, Deer Valley Road, Heidorn Ranch Road, Canada Valley Road, and Mokelumne Drive, and Marita Drive. The wide shoulders on Lone Tree Way are currently being used as bicycle facilities. However, when the third traffic lane is striped on Lone Tree Way, there will be no bicycle lanes on the roadway. Bicycle traffic has been planned to use the Class I bike path along the EBMUD aqueduct, as described above. At the existing Walmart there is one bicycle rack that will hold up to 25 bicycles that is not fastened to the ground.

REGULATORY SETTING

City of Antioch General Plan

The City of Antioch General Plan contains the following objectives, policies, and service standards for transportation facilities which are relevant to the project:

Growth Management Element

3.4 Service Standards for Transportation Facilities

3.4.1 Routes of Regional Significance

[Includes major roadways such as SR-4 Bypass, Lone Tree Way, Hillcrest Avenue, Deer Valley Road.]

3.4.1.1 Performance Standards for Routes of Regional Significance

[For “Suburban” roadways such as Lone Tree Way and Hillcrest Avenue, maintain Level of Service (LOS) of “Low-D” which corresponds to a Volume-to-Capacity Ratio (v/c) of 0.80 – 0.84.]

3.4.2 Basic Routes

[Includes local roadways such as Indian Hill Drive, Vista Grande Drive, Canada Hills Drive, etc.]

3.4.1.1 Performance Standards for Basic Routes

[For residential and arterial roadways in non-Regional Commercial areas, maintain Level of Service (LOS) of Mid-range “D” which corresponds to a Volume-to-Capacity Ratio (v/c) of 0.83 – 0.87.]

3.4.5 Transportation Systems Management (TSM) Policies

- a. Continue to implement the City’s TSM program to reduce trip generation and maximize the carrying capacity of the area’s roadway system. (Note: TSM policies which would be applicable to the project are enumerated under Circulation Element Policy 7.4.2 below.)

Circulation Element

7.3.1 Vehicular Circulation Objective

Provide adequate roadway capacity to meet the roadway performance standards set forth in the Growth Management Element. (Note: The applicable standards are discussed above under ‘Intersection Level of Service’.)

7.3.1 Vehicular Circulation Policies

- h. 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.
- x. Require new development to construct all on-site roadways, including Circulation Element routes, and provide a fair share contribution for needed offsite improvements needed to maintain the roadway performance standards set forth in Growth Management Element. Contributions for offsite 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.

7.4.1 Non-Motorized Transportation Objectives

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.

7.4.2 Non-Motorized Transportation Policies

- h. Require provision of bicycle parking and other support facilities (e.g., racks or lockers) as part of new office and retail developments.

- k. Orient site design in non-residential areas to allow for safe and convenient pedestrian access from sidewalks, transit and bus stops, and other pedestrian facilities, in addition to access through required parking facilities.
- l. Require the construction of attractive walkways in new residential, commercial, office, and industrial developments, including provision of shading for pedestrian paths.
- n. Ensure that the site design of new developments provides for pedestrian access to existing and future transit routes and transit centers.

7.5.1 Transit Objective

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.

7.5.2 Transit Policies

- h. 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.

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines, Appendix G, the project would be considered to result in a significant traffic and circulation impact if it would result in the following:

- Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).
- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.

(The determination of significance of traffic impacts is made through application of level of service standards established by the Contra Costa County Transportation Authority (CCCTA) and the City of Antioch. The applicable standards and criteria are described in detail above under 'Intersection Level of Service'.)

A significant impact would occur if levels of service at the study intersections drop below the established thresholds or if an intersection operating below the acceptable thresholds experiences an increase in v/c or a worse level of service. (Note: At an intersection which is already operating below acceptable service levels, any increase in v/c or delay, no matter how small, is considered to be a significant impact.)

For vehicle queuing, a significant impact occurs if the queue increases by one or more vehicles (i.e., 25 feet or more) and the vehicle queue exceeds the turn pocket length.

- A change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantial increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Inadequate emergency access.
- Inadequate parking capacity.
- A conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

[Note: Of the significance criteria listed above, all but the third item (change in air traffic patterns) are associated with potentially significant project impacts, which are addressed below. For the third checklist item, the initial scoping for this EIR determined that the project would result in no impacts or less-than-significant impacts with respect to this item. The determination related to this item is discussed in Section III. *Effects Found Not to Be Significant.*]

In addition, the City of Antioch considers that a project would result in a significant impact if it would:

- Create the demand for public transit service above that which is provided, or planned to be provided;
- Create an unmet need for bicycle or pedestrian facilities; or

TRAFFIC AND CIRCULATION IMPACT ANALYSIS

The following is a summary discussion of potential project impacts on the transportation system, based on the traffic report by Kimley-Horn and Associates contained in Appendix H. This discussion is followed by the identification of specific project impacts upon the transportation system, along with corresponding mitigation measures as appropriate.

Project Trip Generation

The amount of traffic generated by the Walmart expansion project was estimated using appropriate trip generation rates from the Institute of Transportation Engineers' publication *Trip Generation, 8th Edition*.

A trip is defined in *Trip Generation* as a single or one-directional vehicle movement with either the origin or destination at the project site. In other words, a trip can be either "to" or "from" the site. In addition, a single customer visit to a site is counted as two trips (i.e., one to and one from the site).

For purposes of determining the worst-case impacts of traffic on the surrounding street network, the trips generated by a proposed development are typically estimated for the peak commute hours of 7:00-9:00 AM and 4:00-6:00 PM. (Recent 24-hour traffic counts in the project vicinity were referenced to determine the AM and PM peak hours for the project area.) While the project itself may generate more traffic during some other time of the day such as around noon, the peak of "adjacent street traffic" represents the time period when the uses generally contribute to the greatest amount of congestion, with

the PM peak commonly being the greatest congestion period. At other times of the day, retail land uses rarely cause impacts. Therefore, this traffic evaluation focused on the weekday AM and PM peaks. This methodology is consistent with the City of Antioch’s standard requirements and practices for the preparation of traffic studies.

The Walmart, when it is expanded, is most appropriately classified as Free-Standing Discount Superstore (ITE Land Use 813). This use is defined by ITE as being “...similar to the free-standing discount stores described in Land Use 815, with the exception that they also contain a full service grocery department under the same roof that shares entrances and exits with the discount store area.”

The existing Walmart store is most appropriately classified as Free-Standing Discount Store (Land Use 815) which is characterized by ITE as being a free-standing store that offers “a variety of customer services, centralized cashiering, and a wide range of products. They typically maintain long store hours 7 days a week.” The major difference between Land Use 813 and Land Use 815 is that Free-Standing Discount Stores do not have a full service grocery department.

To accurately portray the change in trips once the existing Walmart discount store becomes a Walmart Supercenter, the existing discount store trips were estimated (based on 130,213 square feet) and subtracted from the street network and the proposed Superstore trips were estimated (based on 170,187 square feet) and added onto the network. (Note: Since the ITE definition of gross floor area excludes areas not included within the exterior building walls, such as outdoor portions of garden centers, the total floor area does not include the net area of 4,886 square feet of the expanded Walmart devoted to outdoor garden center.) Excluding areas outside the principal walls does not suggest that they do not generate trips to or from the project site; rather, the trips generated by the outdoor garden center are already incorporated in the ITE trip generation rates for the enclosed floor area. The trip generation for the proposed project is shown in Table 11. (For a detailed discussed of trip generation for the project, see the traffic report in Appendix G.)

TABLE 11
WALMART EXPANSION TRIP GENERATION

TIME PERIOD	LAND USE	Trip Generation Rate			Project Trips		
		In	Out	Total	In	Out	Total
AM Peak	Free Standing Discount Store (130.213 KSF)	0.72	0.34	1.06	(94)	(44)	(138)
	<i>Discount Store Pass-by (0)</i>				0	0	0
	Free Standing Discount Superstore (170.187 KSF)	0.94	0.75	1.67	159	125	284
	<i>Discount Superstore Pass-by (0)</i>				0	0	0
	Net New Vehicle Trips				65	81	146
PM Peak	Free Standing Discount Store (130.213 KSF)	2.50	2.50	5.00	(326)	(325)	(651)
	<i>Discount Store Pass-by (17%)</i>				56	55	111
	Free Standing Discount Superstore (170.187 KSF)	2.26	2.35	4.61	385	400	785
	<i>Discount Superstore Pass-by (28%)</i>				(108)	(112)	(220)
	Net New Vehicle Trips				7	18	25

Source: Kimley-Horn and Associates.

Project Pass-by Trips

The Walmart expansion will generate a specific number of vehicle trips; however, many of the trips will already be on the road and will likely stop as they pass by the site. Some vehicles are likely to stop as they pass by the Walmart as a matter of convenience on their path to another destination. These are not new vehicle trips but are considered to be pass-by trips. To be consistent with the trip generation assumptions noted above, weekday PM pass-by reductions for the existing store were based on Free-Standing Discount Store (Land Use 815) (i.e., 17% pass-by), and weekday PM pass-by reductions for the expanded store were based on Free-Standing Discount Supercenter (Land Use 813) (i.e., 28% pass-by). No AM pass-by was assumed because no data was available.

“Net New” Project Trips

As shown in Table 11, the project will generate approximately 146 new peak AM trips and approximately 25 new peak PM trips. This is a result of the differences in shopping characteristics associated with the existing and proposed store formats (i.e., discount store vs. superstore).

Trip Distribution and Assignment

The directional trip distribution and assignment of project-generated trips was estimated based on distributions prepared in previous traffic reports, existing traffic count information, and the general orientation of population sources to the site. (See the traffic report in Appendix H for detailed discussion and illustrations.)

Planned Roadway Improvements in Project Vicinity

Several transportation improvements are programmed for the study area intersections and are scheduled for completion prior to or at approximately the same time as the completion of the Walmart expansion project (i.e., late 2010). According to the City of Antioch, these include the following roadway or intersection improvements. (The intersection numbers correspond to those shown in Figure 12.)

Lone Tree Way/Deer Valley Road (Intersection #8) – Lengthen westbound Lone Tree Way left-turn lane to southbound Deer Valley Road to 500 feet, lengthen the westbound Lone Tree Way right-turn lane to northbound Deer Valley Road to 400 feet, lengthen the southbound Deer Valley Road left-turn lane to eastbound Lone Tree Way to 190 feet, construct a second southbound Deer Valley Road left-turn lane to eastbound Lone Tree Way for 800 feet, and lengthen the eastbound Lone Tree Way right-turn lane to southbound Deer Valley Road to 400 feet. This is part of the Lone Tree Way Corridor project (AD27/31R) and will be completed by 2010.

Lone Tree Way/Prewett Park (Intersection #9) – Restripe westbound Lone Tree Way through-shared-right to a through and a right-turn lane to northbound Prewett Park. This is part of the Prewett Park project and will be completed by 2010.

Lone Tree Way/Sagebrush Drive (Intersection #10) – Lengthen westbound Lone Tree Way left-turn lane to southbound Sagebrush Drive to 600 feet. This is part of the Lone Tree Way Corridor project (AD27/31R) and will be completed by 2010.

Lone Tree Way/Hillcrest Avenue (Intersection #14) – Lengthen eastbound Lone Tree Way left-turn lane to northbound Hillcrest Avenue to 620 feet, restripe Lone Tree Way to three lanes in the eastbound and westbound directions, construct a second southbound Hillcrest Avenue left-turn lane to eastbound Lone Tree Way for 600’ as well as change the southbound Hillcrest Avenue left-shared-through lane to a through lane, and modify traffic signal phasing to become eight phases (change northbound and southbound from split phasing to have protected left-turn phasing). This is part of the Lone Tree Way Corridor project (AD27/31R) and will be completed by 2010.

Hillcrest Avenue/Prewett Ranch Drive (Intersection #21) – Take signal out of flash mode and complete the south leg of the intersection extending Hillcrest Avenue to the south. This is funded by the Aviano Adult Community project and will be completed by 2010

The above roadway improvements are either programmed City capital improvement projects, or are required as mitigation for other approved projects in the vicinity.

In addition, intersections on Lone Tree Way are currently being retimed and placed under coordinated operation.

Cumulative Projects

Based on input provided by the staffs of the cities of Antioch, Brentwood, and Oakley, a list was prepared of approved, pending, and reasonably foreseeable development projects which would generate background traffic upon completion of the Walmart expansion project. These “approved/pending” projects are listed in Table 2 in Section I. D. *Approved, Pending, and Foreseeable Projects/Cumulative Impacts*. Projects considered for this traffic study were identified by the cities of Antioch, Brentwood, or Oakley as either having been approved (but not yet completed or fully occupied), or having a development application submitted, or being otherwise reasonably foreseeable at the time the Notice of Preparation (NOP) of the Walmart Expansion EIR was issued on August 13, 2008. The initial list of cumulative projects included all known projects in Antioch, Brentwood, and Oakley. Kimley-Horn and Associates considered each initially listed project in terms of its potential to generate traffic which would affect any of the study intersections. Projects which were determined to contribute no traffic or a negligible volume of traffic to study intersections were not included in the traffic analysis.

Near-Term Level of Service Traffic Conditions

Table 12 shows the results of the Level of Service analysis for Existing Conditions, Near-Term Conditions without Project Conditions, and Near-Term Plus Project conditions. The near-term analysis assumes completion and opening of the Walmart expansion project in late 2010. As noted above, only those roadway improvements which are programmed and scheduled to be completed by late 2010 are considered in the analysis. For purposes of this analysis, all of the cumulative development projects listed in Table 2 are assumed to be completed and occupied by late 2010.

TABLE 12
NEAR-TERM LEVEL OF SERVICE SUMMARY

Int. #	Intersection	Criteria	Existing				Near Term				Near Term+Project			
			AM		PM		AM		PM		AM		PM	
			LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay
Signalized Intersections														
1	Country Hills Drive/Deer Valley Road	0.85	A	0.44	A	0.38	A	0.47	A	0.47	A	0.47	A	0.47
2	Laurel Road/Hillcrest Avenue	0.85	A	0.31	A	0.22	A	0.33	A	0.27	A	0.34	A	0.27
3	Country Hills Drive/Hillcrest Avenue	0.85	A	0.35	A	0.27	A	0.39	A	0.31	A	0.39	A	0.30
6	Lone Tree Way/Country Hills Drive	0.85	B	0.63	A	0.50	C	0.71	A	0.58	C	0.72	A	0.58
7	Lone Tree Way/Deer Valley Plaza	0.85	A	0.35	A	0.40	A	0.45	A	0.50	A	0.45	A	0.50
8	Lone Tree Way/Deer Valley Road	0.85	B	0.63	A	0.59	C	0.72	D	0.81	C	0.73	D	0.81
9	Lone Tree Way/Prewett Park	0.85	A	0.47	A	0.37	A	0.55	A	0.49	A	0.56	A	0.49
10	Lone Tree Way/Sagebrush Drive	0.85	A	0.37	A	0.38	A	0.46	A	0.51	A	0.47	A	0.51
11	Lone Tree Way/Williamson Ranch Plaza	0.85	A	0.34	A	0.34	A	0.48	A	0.50	A	0.49	A	0.51
12	Lone Tree Way/Indian Hill Drive	0.85	A	0.42	A	0.39	A	0.54	A	0.53	A	0.57	A	0.53
14	Lone Tree Way/Hillcrest Avenue	0.85	A	0.40	A	0.48	A	0.50	A	0.54	A	0.52	A	0.54
15	Lone Tree Way/Vista Grande Drive	0.85	A	0.39	A	0.54	A	0.39	A	0.55	A	0.39	A	0.56
16	Lone Tree Way/Heidorn Ranch Road	0.85	A	0.22	A	0.33	A	0.30	A	0.45	A	0.30	A	0.46
17	Lone Tree Way/Canada Valley Road	0.85	A	0.34	A	0.52	A	0.52	B	0.69	A	0.53	B	0.69
18	Lone Tree Way/SR-4 Bypass	0.85	A	0.42	A	0.58	A	0.53	D	0.84	A	0.53	D	0.84
19	Lone Tree Way/Jeffrey Way	0.85	A	0.27	A	0.44	A	0.36	A	0.57	A	0.36	A	0.57
20	Marita Drive/Deer Valley Road	0.85	A	0.29	A	0.26	A	0.39	A	0.39	A	0.39	A	0.39
21	Prewett Ranch Drive/Hillcrest Avenue	0.89	-	-	-	-	A	0.16	A	0.17	A	0.17	A	0.17
Unsignalized Intersections														
4	Northeast Wal-Mart Driveway/Hillcrest Avenue													
	EB Approach	D	B	13.0	B	11.5	B	14.0	B	12.4	C	15.7	B	12.9
	Southeast Wal-Mart Driveway/Hillcrest Avenue													
5	EB Approach	D	B	10.1	B	10.2	B	10.3	B	10.5	B	10.4	B	10.7
	WB Approach	D	A	9.5	A	9.6	A	9.8	B	10.2	A	9.9	B	10.2
13	Lone Tree Way/Wal-Mart Driveway													
	SB Approach	D	B	10.8	A	9.9	B	12.1	B	11.0	B	12.1	B	11.1
21	Prewett Ranch Drive/Hillcrest Avenue	D	A	8.3	A	8.5	-	-	-	-	-	-	-	-

Source: Kimley-Horn and Associates

Table 12 shows that under near-term conditions without the addition of traffic generated by the Walmart expansion, all of the study intersections would operate at acceptable levels of service. Under near-term conditions with the Walmart expansion traffic added, all of the study intersections would continue to operate at acceptable levels of service.

Far-Term Level of Service Traffic Conditions

Table 13 shows the results of the Level of Service analysis for far-term conditions, with and without the project.

TABLE 13
FAR-TERM LEVEL OF SERVICE SUMMARY

Int. #	Intersection	Criteria	Near Term				Near Term + Project				Long-Term				Long-Term + Project			
			AM		PM		AM		PM		AM		PM		AM		PM	
			LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay
Signalized Intersections																		
1	Country Hills Drive/Deer Valley Road	0.85	A	0.47	A	0.47	A	0.47	A	0.47	A	0.57	A	0.52	A	0.57	A	0.52
2	Laurel Road/Hillcrest Avenue	0.85	A	0.33	A	0.27	A	0.34	A	0.27	B	0.65	B	0.63	B	0.65	B	0.63
3	Country Hills Drive/Hillcrest Avenue	0.85	A	0.39	A	0.31	A	0.39	A	0.30	A	0.48	A	0.47	A	0.48	A	0.47
6	Lone Tree Way/Country Hills Drive	0.85	C	0.71	A	0.58	C	0.72	A	0.58	E	0.96	D	0.88	E	0.97	D	0.88
7	Lone Tree Way/Deer Valley Plaza	0.85	A	0.45	A	0.50	A	0.45	A	0.50	A	0.55	B	0.61	A	0.56	B	0.61
8	Lone Tree Way/Deer Valley Road	0.85	C	0.72	D	0.81	C	0.73	D	0.81	D	0.83	D	0.89	D	0.84	D	0.89
9	Lone Tree Way/Prewett Park	0.85	A	0.55	A	0.49	A	0.56	A	0.49	B	0.63	A	0.57	B	0.63	A	0.57
10	Lone Tree Way/Sagebrush Drive	0.85	A	0.46	A	0.51	A	0.47	A	0.51	A	0.60	A	0.57	B	0.60	A	0.57
11	Lone Tree Way/Williamson Ranch Plaza	0.85	A	0.48	A	0.50	A	0.49	A	0.51	A	0.54	A	0.58	A	0.55	A	0.58
12	Lone Tree Way/Indian Hill Drive	0.85	A	0.54	A	0.53	A	0.57	A	0.53	A	0.58	B	0.63	B	0.61	B	0.63
14	Lone Tree Way/Hillcrest Avenue	0.85	A	0.50	A	0.54	A	0.52	A	0.54	B	0.71	E	0.91	C	0.73	E	0.91
15	Lone Tree Way/Vista Grande Drive	0.85	A	0.39	A	0.55	A	0.39	A	0.56	A	0.46	B	0.64	A	0.46	B	0.64
16	Lone Tree Way/Heidorn Ranch Road	0.85	A	0.30	A	0.45	A	0.30	A	0.46	A	0.57	C	0.74	A	0.57	C	0.74
17	Lone Tree Way/Canada Valley Road	0.85	A	0.52	B	0.69	A	0.53	B	0.69	B	0.67	D	0.84	B	0.68	D	0.84
18	Lone Tree Way/SR-4 Bypass	0.85	A	0.53	D	0.84	A	0.53	D	0.84	C	0.71	E	0.98	C	0.72	E	0.98
19	Lone Tree Way/Jeffrey Way	0.85	A	0.36	A	0.57	A	0.36	A	0.57	B	0.70	C	0.75	C	0.70	C	0.75
20	Marita Drive/Deer Valley Road	0.85	A	0.39	A	0.39	A	0.39	A	0.39	A	0.45	A	0.42	A	0.45	A	0.42
21	Prewett Ranch Drive/Hillcrest Avenue	0.89	A	0.16	A	0.17	A	0.17	A	0.17	A	0.43	A	0.58	A	0.43	A	0.58
Unsignalized Intersections																		
4	Northeast Wal-Mart Driveway/Hillcrest Avenue																	
	EB Approach	D	B	14.0	B	12.4	C	15.7	B	12.9	C	16.9	C	19.2	C	17.2	C	19.2
5	SE Southeast Wal-Mart Driveway/Hillcrest Avenue																	
	EB Approach	D	B	10.3	B	10.5	B	10.4	B	10.7	B	11.1	B	12.2	B	11.2	B	12.6
	WB Approach	D	A	9.8	B	10.2	A	9.9	B	10.2	B	10.9	B	11.5	B	11.0	B	11.0
13	Lone Tree Way/Wal-Mart Driveway																	
	SB Approach	D	B	12.1	B	11.0	B	12.1	B	11.1	B	12.8	C	15.6	B	12.8	C	12.2

Note: Locations operating unacceptably are bolded and significant impacts are highlighted.

Source: Kimley-Horn

As shown in Table 13, the following four intersections would function at unacceptable service levels under far-term conditions, without the addition of traffic from the Walmart expansion.

- Lone Tree Way/Country Hills Drive (AM and PM)
- Lone Tree Way/Deer Valley Road (PM only)
- Lone Tree Way/Hillcrest Avenue (PM only)
- Lone Tree Way/SB SR-4 Bypass (PM only)

Under far-term conditions with the Walmart expansion traffic added, there are no additional intersections that do not function within acceptable service standards due to the Walmart expansion project. In addition, the traffic added by the project does not increase the v/c ratios at three of the four intersections which would be operating with less than acceptable levels of service. However, the addition of the project would increase the v/c (volume/capacity) ratio by 0.01 during the AM peak hour at the intersection of Lone Tree Way/Country Hills Drive. Although this represents a slight increase in congestion, because it occurs at an intersection which would be functioning at unacceptable LOS E without the project, it is considered a significant impact.

Delay Index

The delay index (DI) is defined as the ratio between the peak congested travel time and the uncongested travel time along a roadway segment of a designated route of regional significance. Based on CCTA criteria, the delay index on Lone Tree Way and the segments of Hillcrest Avenue and Deer Valley Road

which are designated as routes of regional significance (in the study area) are to have a DI of less than 2.0.

Under existing conditions, all regionally significant routes in the study area operate at a DI of less than 2.0. Under far-term conditions, Lone Tree Way in the eastbound and westbound directions is expected to have a DI greater than 2.0 during the PM peak, with or without the project. With the addition of project traffic, the unacceptable DI on Lone Tree Way will worsen slightly in both directions during the AM peak hour. Therefore, the project would result in a significant impact in terms of added delay along this roadway. (See the traffic report in Appendix H for calculations.)

Vehicle Queuing

As congestion increases it is common for traffic at signals and stop signs to form lines of stopped (or queued) vehicles. Queue lengths are determined for each lane and indicate the distance that vehicles will back up in each direction approaching an intersection. Calculation of adequate queue lengths are based on the 95th percentile queue, which reflects the point at which traffic volumes and related queuing will be at, or less than, 95 percent of the time during the peak period. Average queuing is generally less. A typical vehicle length of 25 feet is used in the queuing analysis.

The effects of vehicle queuing were analyzed and a significant impact was assumed to occur if the queue increases by one or more vehicles (i.e., 25 feet or more) and the vehicle queue exceeds the turn pocket length.

Under existing conditions, there are several turn bays where queue lengths exceed storage capacity during the AM or PM peak periods. The queuing analysis indicated that under near-term and far-term conditions plus the Walmart expansion project, at all turn locations with pre-existing deficiencies the increase in vehicle queuing resulting from the project is less than one vehicle. As discussed above, an incremental increase in queuing of less than one vehicle at a location with insufficient queuing capacity without the project is considered less than significant. (A detailed summary of queuing analysis results is contained in the traffic report in Appendix H.)

Potential Effects on Transit, Bicycle, and Pedestrian Mobility

Public Transit

Patrons to Walmart have the option of taking transit to reach the site via Routes 380 and 392 of the Tri-Delta Transit system. Based on transit ridership rates for Antioch residents, it was estimated by Kimley-Horn that approximately 6 passengers in the weekday AM peak period and none in the weekday PM peak period could take transit to shop at the Walmart expansion. It was determined that sufficient capacity exists on the buses to accommodate the potential additional transit demand. Furthermore, dispersion of the project-generated riders to the bus routes would result in a minimal effect on transit capacity.

In general, there are adequate transit facilities adjacent to or near the project site with continuous sidewalks and ramps to the transit stop locations. Thus the project impact on transit service is determined to be less than significant.

Pedestrian Access

There are adequate pedestrian walkways from the project site to the existing sidewalks on Lone Tree Way and Hillcrest Avenue. In addition, there are continuous sidewalk facilities within the neighborhoods and on streets adjacent to the Walmart site. This will allow Walmart patrons and employees to conveniently walk from nearby destinations or access transit services. Pedestrian crosswalks are present on approaches at signalized intersections near the project site. In addition, the project will construct necessary on-site sidewalks, walkways and other pedestrian amenities, as required by the City of Antioch. Therefore, no deficiencies are anticipated for pedestrian facilities.

Bicycle Access

As described under ‘Environmental Setting,’ there are existing Class I and II bicycle facilities on Lone Tree Way and Hillcrest Avenue as well as several other streets farther from the site. The bicycle rack at the existing Walmart should be fastened to the ground to make it more secure and help prevent theft of bicycles. With the expansion of the Walmart, an additional bike rack will be installed and fastened so there will be parking for a minimum of 37 bicycles to comply within the City Municipal Code of one bicycle parking space per 25 vehicle parking spaces for the entire Walmart store. Therefore, no deficiencies are anticipated for bicycle facilities.

In summary, the Walmart expansion’s impact on transit, pedestrian or bicycle facilities would be less than significant.

Site Access and Circulation

In cases where there is insufficient stacking distance provided along internal driveways, the vehicles waiting to exit the site can back up into the parking area resulting in blocked parking aisles which in turn can generate on-site congestion and inhibit efficient parking lot circulation. However, Kimley-Horn’s analysis of on-site queuing with the planned expansion indicated that vehicles are not expected to queue up beyond the depth of the driveway throats and thus would not block parking aisles.

Expansion of the Walmart store will include a new parking field and circulatory drive aisles west of the store. Parking aisles are oriented toward the Walmart which will allow shoppers to push large shopping carts from the store to their vehicles without having to pass between parked vehicles. New pedestrian walkways are planned from the store front out into the parking lot.

Heavy vehicles serving the Walmart will continue to use the Indian Hill Drive access from Lone Tree Way. Large semi-trucks entering the site typically must encroach into the exiting traffic lane to avoid having the rear wheels of the trailer off-track into the adjacent landscaping. Once on site, trucks will travel along the west property line to a new truck dock on the west side of the planned expansion or to the existing truck dock on the north side of the building. Kimley-Horn determined that the parking and circulation layout provides convenient access to the loading docks and adequate truck turnaround area.

Sight distances, emergency access truck access, and on-site circulation planned for the project appear to be generally adequate, according to Kimley-Horn’s review of the project site plan, and would be subject to refinements as part of the City’s design review process.

Parking

The existing 141,498 square-foot Walmart store includes 742 parking spaces. The expansion project will add 176 spaces for a total of 918 parking spaces. The expanded Walmart will have a total gross floor area of 175,073 square feet (including outdoor portion of garden center), which will require a total of 876 spaces at the City's required rate of a minimum of 5 spaces per 1,000 square feet of gross floor area for retail sales and shopping center land uses. Therefore, the parking to be provided will exceed the City's parking requirement for the project by 42 spaces. As such, the expansion project will not result in a parking deficiency.

IMPACTS AND MITIGATION

The following summarizes the above discussion of the project impacts on the roadway, transit, and bicycle/pedestrian systems. It should be noted that with the transportation improvements which have occurred in the project vicinity over the past several years, the traffic impacts and mitigation measures identified in the 1998 IS/MND are no longer valid or applicable to the project.

Project-Specific Impacts

Impact K1. Near-Term (2010) Intersection Level of Service. With the addition of traffic generated by Walmart expansion project, Levels of Service at all affected intersections would be LOS A through D, and thus would meet the applicable LOS criteria. (Less-than-Significant Impact)

Mitigation. No mitigation required.

Impact K2. Far-Term (2025) Intersection Level of Service. With the addition of traffic generated by Walmart expansion project, the Lone Tree Way/Country Hills Drive intersection, which will operate at unacceptable LOS E in the AM peak hour without the project, will undergo a slight increase in v/c (volume to capacity ratio), i.e., congestion, during the AM peak hour as a result of traffic added by the project. However, this impact was mitigated in April 2009 by a City-initiated signal optimization project for the Lone Tree Way corridor. With the signal optimization, the intersection will operate at acceptable LOS D in the AM peak hour in the Far Term. (Less-than-Significant Impact)

The signal operation at this intersection was re-configured from allowing both through and left-turn movements in a given direction to occur simultaneously while traffic in other directions was stopped, to adding protected left-turn phases, allowing the opposing left-turn movements to occur simultaneously while the opposing through movements are stopped. This modification provides for more efficient traffic flow through the intersection and results in substantial reduction of congestion. Kimley-Horn and Associates has determined that the recently completed signal modification will reduce the increased congestion resulting from the project in the Long-Term because the modifications will result in the Lone Tree

Way/Country Hills Drive intersection operating at acceptable LOS D in the AM peak hour in the Long-Term, and will decrease the v/c to 0.83, which is a substantial improvement over pre-project conditions. Therefore, the potentially significant impact to long-term intersection level of service identified in the project traffic analysis is no longer projected to occur because of the recent improvements to the signal phasing at this intersection.

Mitigation . No mitigation required.

See discussion under Impact K2 above.

Significance after Mitigation. Less-than-Significant Impact.

Impact K3. Far-Term (2025) Delay Index. With the addition of traffic generated by Walmart expansion project, the delay index on Lone Tree Way, which will be at an unacceptable delay index of greater than 2.0 without the project, will undergo a slight increase in congestion and delay during the AM peak period as a result of traffic added by the project. (Potentially Significant Impact)

Mitigation K3. The timing of the signal phasing shall be optimized at the intersection of Lone Tree Way/Deer Valley Road, in the Far Term. Prior to the Certificates of Occupancy for the project, the applicant shall contribute \$11,000 to the City of Antioch Traffic Signal Maintenance Fund to cover the cost of the signal optimization. After mitigation, the Delay Index and volume to capacity ratio (v/c) will be improved to better than pre-project levels in the Far-Term.

Since the efficiencies gained by timing optimization are typically minor, signal retiming projects are usually performed in response to traffic congestion that is already occurring. The City of Antioch performs signal retiming at signalized intersections on an as-needed basis; that is, when traffic congestion warrants retiming of signals to optimize traffic flow. This work is funded by the Traffic Signal Maintenance Fund. Therefore, the project contribution to the Traffic Signal Maintenance Fund would ensure that retiming of the Lone Tree Way/Deer Valley Road intersection would take place in the Far-Term when project impact in terms of added congestion at the intersection occurs. After the signal retiming is performed in the Far-Term, as prescribed, Kimley-Horn and Associates expects that the Delay Index and volume to capacity ratio (v/c) will be improved to better than pre-project levels in the Far Term.

Currently, the cost of signal retiming in Antioch ranges from about \$4,000 to \$7,000, with the cost in any given instance depending on the complexity of the case. To be conservative, the estimated cost for retiming the Lone Tree Way/Deer Valley Road signal was based on the higher \$7,000 figure, which was then increased at a 3 percent annual rate (average annual inflation over the past 20 years was 2.8 percent) to arrive at an estimated cost of \$11,000 to perform the signal timing in the Long Term (assumed for calculation purposes to occur in 2025, the projected year of General Plan buildout).

Significance after Mitigation. Less-than-Significant Impact.

Impact K4. Transit, Bicycle and Pedestrian Facilities. The Walmart expansion project would not result in operational or capacity deficiencies to the transit, bicycle or pedestrian facilities serving the project or the project area, and would not conflict with adopted policies, plans, or programs supporting alternative transportation (Less-than-Significant Impact)

As discussed under ‘Environmental Setting’, there are four existing transit stops on Lone Tree Way and Hillcrest Avenue in the immediate project vicinity. The project site plan shows provision for full pedestrian interconnections within the site and with sidewalks and transit stops on and near the site perimeter. The site is served by existing bicycle lanes on Lone Tree Way and Hillcrest Avenue, and provisions for bicycle storage are included in the project. The project is consistent with Circulation Element Policies 7.4.2 and 7.5.2 which provide for non-motorized transportation and transit alternatives (see ‘Regulatory Setting’ for policy language).

Mitigation. No mitigation required.

Impact K5. Vehicular Access and Circulation. The planned Walmart expansion would not result in on-site congestion, safety issues, or access problems for trucks or emergency vehicles due to inadequate design of site access and circulation. (Less-than-Significant Impact)

According to Kimley-Horn’s review of the project site plan, the sight distances, emergency access, truck access, and on-site circulation planned for the project appear to be generally adequate and would not result in on-site congestion, safety issues or access problems.

Mitigation. No mitigation required.

Impact K6. Parking. The planned expansion would result in a total Walmart parking supply which meets the City of Antioch parking requirements for the project; therefore, the project would not result in a parking deficiency. (Less-than-Significant Impact)

The existing 141,498 square-foot Walmart store includes 742 parking spaces. The expansion project will add 176 spaces for a total of 918 parking spaces. The expanded Walmart will have a total gross floor area of 175,073 square feet (including outdoor portion of garden center), which will require a total of 876 spaces at the City’s required rate of a minimum of 5 spaces per 1,000 square feet of gross floor area for retail sales and shopping center land uses. Therefore, the parking to be provided will exceed the City’s parking requirement for the project by 42 spaces. As such, the expansion project will not result in a parking deficiency.

Mitigation. No mitigation required.

Cumulative Impacts

Impact K7. **Cumulative Traffic Impacts.** The far-term cumulative traffic impacts are significant and the project contribution to the far-term cumulative traffic impact is considerable. [The cumulative traffic impacts are evaluated together with project-specific traffic impacts under Impacts H1 through H4 above.] (Potential Cumulatively Significant Impact)

Geographic Scope of Analysis of Cumulative Traffic Impact Analysis

Traffic impacts can extend for considerable distances depending on the magnitude of the project and the remaining capacities of roadways and intersections serving the project. For purposes of this EIR, the study area for the analysis of cumulative traffic impacts was defined by Kimley-Horn and Associates as lands within an approximate two to three mile radius of the proposed project. The approved, pending, and reasonably foreseeable projects within this radius are listed in Table 2 and shown in Figure 9.

[Note: For purposes of this EIR, the term ‘cumulative’ can apply to near-term conditions (i.e., 2010), or far-term conditions (i.e., General Plan buildout). This is explained in detail in Section I. E. Although the term “cumulative” is sometimes used to refer to far-term conditions and is sometimes used interchangeably with “far term,” especially in traffic studies, these terms are explicitly not considered synonymous for purposes of this EIR.]

Cumulative Impact Discussion

Near-Term (2010)

As shown in the preceding analysis, the impact of cumulative projects on the roadway network is inextricably linked to project impact. The analysis of baseline conditions for each scenario incorporates cumulative traffic upon which project traffic is added. Thus the results of the impact analysis for each scenario are in fact cumulative analyses from which the project share of impact can be derived based on proportionate share of traffic generation. The analyses of near-term scenarios concluded that cumulative impacts to traffic operations would be *less than significant*.

Far-Term (2025)

As shown in the preceding analysis, under far-term conditions with buildout of General Plan land uses, a cumulatively significant impact occurs due to a slight worsening of the delay index at along this segment of Lone Tree Way in the far term, which will already be operating at unacceptable levels without the project, as discussed under Impact K3. Therefore, the far-term cumulative impacts to traffic operations will be *potentially significant*, and the project contribution to the significant cumulative traffic impacts will be *potentially considerable*.

Mitigation H5. [Mitigation for the far-term cumulative traffic impact is included with the mitigation measure for project-specific impact identified in Mitigation K3].

As discussed in the preceding analysis, the far-term worsening of delay conditions along this segment of Lone Tree Way will be mitigated to less-than-significant levels through signal phasing improvements to be implemented in conjunction with the proposed project, as identified in Mitigation K3.

Significance after Mitigation. Less-than-Significant Cumulative Impact.

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L. UTILITIES AND SERVICE SYSTEMS

This section describes existing conditions and addresses potential impacts to water demand and sanitary sewer service. (Storm drainage is discussed in Section *II. G. Hydrology and Water Quality*.)

BACKGROUND DISCUSSION

At the time the original IS/MND was prepared, there were no domestic water or sanitary sewer facilities within the project site, although the off-site facilities to serve site development were in place within the adjacent rights-of-way of Lone Tree Way and Hillcrest Avenue. Since then, the existing Walmart store was constructed along with the necessary on-site water supply and sanitary sewer lines needed to support a 245,100 square foot project (as approved for Williamson Ranch Plaza Phases 1 and 2).

ENVIRONMENTAL SETTING

Water Supply

Domestic water supply and fire flows for the existing Walmart store are provided by the City of Antioch from its existing 16-inch water main in Hillcrest Avenue. The on-site water system consists of a private 12-inch line which connects to an 8-inch pipe which loops around the existing Walmart building.

The City of Antioch obtains its water supply directly from the San Joaquin River and from the Contra Costa Canal, a facility of the Contra Costa Water District. The raw water is treated at the City's water treatment plant prior to distribution for public use. In 2008, the City of Antioch Water Treatment Plant produced over 6 billion gallons of water for distribution. Treated water quality currently meets or exceeds all state and federal drinking water standards.

The plan for long-term water supply for the City of Antioch is set forth in its Urban Water Management Plan (UMWP), adopted in 2006. The UMWP includes detailed analysis of for Antioch's water supply through 2025, under normal year, dry year, and multiple dry year conditions. Based on its analysis of supply and demand through 2025, the UMWP concluded that the City should have adequate supply to meet demand in normal, single, and multiple dry years. In accordance with State law, the UMWP established four stages of action to be taken in response to water supply shortages, and establishes conservation measures to be taken during drought conditions. During the third year of multiple dry years, the UMWP stipulates that voluntary/mandatory reductions in demand will be 15 percent.

The State of California is currently in the third year of a drought. In response to statewide water shortages, the Contra Costa Water District and the City of Antioch have ordered mandatory water restrictions. On May 26, 2009, the Antioch City Council adopted Drought Management Regulations, to become effective on July 1, which prohibit the use of water for non-essential purposes such as excessive watering, washing of hard surfaces, use of water in non-recirculating decorative fountains, among other things. The Regulations, which will remain in effect until no longer deemed necessary, establish a water reduction goal of 15 percent, with consumption over that amount subject to surcharges if excessive use charges are imposed on the City by the Contra Costa Water District.

It is noted that drought conditions such as those the state and City are currently experiencing are anticipated and planned for in the UMWP, and the City's water demand reduction regulations are

consistent with the measures provided in the UWMP. These historically recurring drought conditions are planned for in the UWMP and do not affect the City's ability to meet its long-term water supply needs.

Wastewater Collection and Treatment

Sanitary sewer service is provided to the existing Walmart store by the City of Antioch from its 18-inch sewer main in Lone Tree Way. Wastewater flows are conveyed from the existing store via an existing 8-inch on-site line which connects to the 18-inch sanitary main in Lone Tree Way. The City's wastewater flows are conveyed to the Bridgehead Pump Station, a facility of the Delta Diablo Sanitation District (DDSD), located in the northeastern corner of Antioch. From here flows are pumped via force main to the DDSD wastewater treatment facility to the west.

Wastewater treatment service is provided for the City of Antioch by the Delta Diablo Sanitation District (DDSD) at its wastewater treatment plant located in northwest Antioch near the Pittsburg border. The current permitted treatment capacity (dry weather flow) at the plant is 16.5 million gallons per day (mgd), and the average annual dry weather flow to the treatment plant in 2008 was 12.9 mgd (the highest treatment flows occurred in 2005 when the average annual dry weather flow to the treatment plant was 14.2 mgd). The treatment facility meets or exceeds the Regional Water Quality Control Board treatment requirements for the facility. In accordance with the master plan for the wastewater treatment plant, incremental plant expansions are planned which will provide for a planned treatment capacity of 22.7 mgd. Incremental improvements to the District's facilities are provided through its comprehensive five-year Capital Improvement Program (CIP). The CIP is updated annually to ensure that expansions and upgrades to treatment, collection, and conveyance facilities are provided as needed and that the rate structure is adjusted to ensure that financial resources are available to implement the improvements when needed.

REGULATORY SETTING

City of Antioch General Plan

The City of Antioch General Plan contains the following objectives, policies, and performance standards related to utilities and service systems:

Growth Management Element

3.5.4 Water Storage and Distribution

3.5.2.3 Performance Objective. Maintain a water system that is capable of meeting the daily and peak demands of Antioch residents and businesses, including provision of adequate fire flows and storage for drought and emergency conditions.

3.5.2.4 Performance Standard. Adequate fire flow as established by the Contra Costa County Fire Protection District, along with sufficient storage for emergency and drought situations and maintain adequate service pressures.

3.5.5 Sanitary Sewer Collection and Treatment Facilities

3.5.3.1 Performance Objective. A wastewater collection, treatment, and disposal system that is capable of meeting the daily and peak demands of Antioch residents and businesses.

3.5.3.2 Performance Standards.

- a. Sanitary sewers (except for force mains) will exhibit unrestricted flow in normal and peak flows.
- b. Prior to approval of discretionary development projects, require written verification from the Delta Diablo Sanitation District that the proposed project will not cause the rated capacity of treatment facilities to be exceeded during normal or peak flows.

Public Services and Facilities Element

8.5.1 Wastewater Management Objective

Ensure a wastewater collection, treatment, and disposal system capable of providing sewer services to existing and future residences, businesses, institutions, recreational facilities, and other uses within the City of Antioch during peak use conditions.

8.5.2 Wastewater Management Policies

- b. Ensure that adequate infrastructure is in place and operational prior to occupancy of new development, such that new development will (1) not negatively impact the performance of sewer facilities serving existing developed areas, and (2) the performance standards set forth in the Growth Management Element will continue to be met.

Resource Management Element

10.7.1 Water Resources Objective

Ensure that an adequate supply of water is available to serve existing and future needs of the City.

10.7.2 Water Resources Policies

Water Supply

- b. Require new development to be equipped with drought tolerant landscaping and water conservation devices.

Zoning Code

Article 10 of the Zoning Code sets forth requirements for project landscaping and irrigation. Section 9-5.1002 requires installation of automatic irrigation systems and encourages drip irrigation. Section 9-5.1003 requires that plant materials be selected for drought tolerance, adaptability to the local environment, and reduced energy demand. It further requires that plant materials and landscape design be consistent with the City's water conservation guidelines.

SIGNIFICANCE CRITERIA

Based on the State CEQA Guidelines, Appendix G, the project would be considered to result in a significant impact to utilities and service systems if it would:

- Have insufficient water supplies available to serve the project from existing entitlements and resources.
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities or infrastructure, the construction of which could result in significant environmental effects.
- Result in a determination by the wastewater treatment provider which serves the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
- Exceed the wastewater treatment requirements of the applicable Regional Water Quality Control Board.

IMPACTS AND MITIGATION

Project-Specific Impacts

Impact L1. Water Supply. The planned expansion project would result in increased demand for domestic water service; however, existing water resources and supply infrastructure are adequate to serve the domestic and fire flow needs of the project. (Less-than-Significant Impact)

It is estimated that the planned expansion will increase an average domestic water demand from the Walmart store by about 4,107 gallons per day (gpd). This based on the Delta Diablo Sanitation District's standard multiplier of 1,000 gallons per acre per day of wastewater flow for commercial users, which was increased by about 11 percent to reflect the typical difference between wastewater flows and domestic water demand (i.e., 3.7 acres X 1,000 gallons/day X 1.11 [conversion of wastewater flow to water demand] = 4,107 gal/day. Exterior water demand for landscaping irrigation is estimated to be about 33 percent of domestic demand, or an additional 1,355 gpd. (The project would use drought tolerant landscaping and water conservation devices, as required under the City of Antioch Zoning Code.) Based on the above factors, it is estimated that the expansion area would generate a total additional water demand of 5,462 gpd.

Water supplies for the project will be provided by the City of Antioch. The City Public Works Department indicates that the City's existing system has sufficient domestic water supply and pressures to serve the incremental domestic and fire flow needs of the project. Domestic water for the expansion area will be provided from the existing 12- to 8-inch water service on the site which connect to the City's 16-inch water main in Hillcrest Avenue. The existing looped water system around the existing building will be relocated as needed to surround the expanded Walmart store.

The City of Antioch Urban Water Management Plan (UWMP) provides water demand and supply figures in five year increments for various water supply scenarios (normal year, dry year, multiple dry years). For 2010, assuming it is the fourth year of a drought, the City's water demand is calculated to be 19,015 acre feet, compared with an available water supply of 31,510 acre feet. Accordingly, available sources of water supply will exceed projected demand by 12,495 acre-feet, or almost 40 percent, in 2010 under continued drought conditions (UWMP, p.7-2). In 2025, assuming it also is the fourth year of a multiple dry-year cycle, the City's available water supply is calculated to be 31,510 acre-feet versus a projected demand of 21,947 acre-feet for that year, representing a 30 percent supply surplus in 2025 under worst-case supply conditions (UWPM, p. 7-4). Based on the City's UWMP, there would be adequate water supply to serve City-wide demands, including the water demands of the proposed project, under near-term and far-term conditions. The City of Antioch Director of Public Works has confirmed that the City has adequate water supply availability to meet project and City-wide demands in the near-term and far-term as presented in the City's Urban Water Management Plan.

As indicated above, the drought conditions such as those the state and City are currently experiencing are anticipated and planned for in the UWMP. The City's recently enacted water demand reduction regulations (described in "Environmental Setting" above) are consistent with the measures provided in the UWMP. These historically recurring drought conditions are planned for in the UWMP, which calls for voluntary and mandatory cutbacks during temporary water shortage conditions, and do not affect the City's ability to meet its long-term water supply needs.

Based on the above discussion, existing water resources and facilities are adequate to serve the domestic water and fire flow needs of the project. (This is consistent with the findings of the 1998 IS/MND which concluded that there was sufficient water supply and infrastructure to serve development of the 245,100 square foot Williamson Ranch Plaza (Phases 1 & 2) project.) Therefore, the impact of the planned expansion project upon water supplies and facilities would be *less-than-significant*.

Mitigation. No mitigation required.

Impact L2. **Wastewater Collection and Treatment.** The planned expansion project would increase the demand for wastewater collection, treatment and disposal facilities serving the site; however, there is sufficient capacity in the municipal wastewater collection, treatment, and disposal system to serve the project without expansion of existing infrastructure. (Less-than-Significant Impact)

It is estimated that the planned expansion will increase base wastewater flows from the Walmart store by about 3,700 gallons per day (gpd). (This based on the Delta Diablo Sanitation District's standard multiplier of 1,000 gallons per acre per day of wastewater flow for commercial users, over the 3.7-acre expansion area.) According to the City Public Works Director, the City's downstream sanitary mains serving the project have sufficient remaining capacity to accommodate the wastewater flows added by the expansion project. The conveyance facilities of the Delta Diablo Sanitation District also have sufficient capacity to carry the incremental flows from Antioch to the wastewater treatment facility at the Antioch-Pittsburg border. Both the DDS and the City of Antioch are in the process of implementing Storm System Management Plans (SSMPs)

which are intended to provide for ongoing assessment of conveyance capacity needs and the identification and implementation of capacity upgrades when needed.

The incremental wastewater flows generated by the project would represent less than 0.03 percent of the average daily flows currently received by the wastewater treatment plant. The treatment plant is currently operating at about 78 percent of permitted capacity, and is planned to be expanded incrementally to meet the treatment demands of urban growth in accordance with the District's wastewater treatment plant master plan. As such, there will be sufficient treatment capacity available to serve the incremental demand of the expansion project without affecting service to other existing or future users, and without exceeding the treatment requirements of the Regional Water Quality Control Board.

In summary, there is currently sufficient capacity in the wastewater collection and treatment system to accommodate the incremental wastewater flows generated by the expansion project without expansion of existing infrastructure. (This is consistent with the findings of the 1998 IS/MND which concluded that there was sufficient capacity in the wastewater collection, treatment and disposal system to serve development of the 245,100 square foot Williamson Ranch Plaza (Phases 1 & 2) project.) Therefore, the impact of the expansion project upon wastewater facilities and services would be *less than significant*.

Mitigation. No mitigation required.

Cumulative Impacts

Impact L3. **Cumulative Utilities and Services Impacts.** The increased demands for water supply, sanitary sewer service, and wastewater collection, treatment, and disposal resulting from the proposed project and other cumulative projects will likely require improvements to and expansions of utilities and service systems. Extensions of utility mains would be constructed as needed in accordance with the City's master utility plans. Water mains and storage facilities would be constructed as needed to meet cumulative water supply demands, and the wastewater treatment capacity would likewise be expanded incrementally to meet growth needs. There are plans and programs currently in place that provide for the necessary capacity expansions. Any physical expansion of facilities would be subject to separate environmental review and any resulting impacts would be mitigated to the extent feasible, as required. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Utilities and Services Impacts

Utilities and services are provided to individual projects within service areas which vary in geographic scope. The City's water supplies are provided by the City of Antioch from imported surface supplies which are treated at the City's water treatment plant, and distributed throughout the City. Since the provision of domestic water occurs on a City-wide scale, the City of Antioch planning area comprises the study area for the analysis of cumulative water supply impacts. Wastewater treatment is provided by the regional wastewater treatment plant which serves the Cities of Antioch, Pittsburg, and Bay Point.

Therefore, the service area of the Delta Diablo Sanitation District comprises the study area for cumulative wastewater treatment and disposal impacts.

Cumulative Impact Analysis

With respect to water supply, the City's water treatment plant has sufficient remaining capacity to provide for incremental growth for the near term and ample area to accommodate planned expansions to meet far-term demands. City of Antioch Urban Water Management Plan (UWMP) indicates that there is sufficient water supply to meet water demands of the City under all conditions including single and multiple dry years. The City's water supply infrastructure (water mains, storage reservoirs, pump stations) are constantly upgraded and expanded to meet growth demands while maintaining minimum fire pressures. As such, the incremental water demand generated by the proposed project and other cumulative projects in the City would be served by sufficient and sustainable water supplies and delivery systems. Therefore, the cumulative impacts to water supplies and infrastructure would be *less than significant*.

With respect to wastewater treatment, the Delta Diablo Sanitation District currently has a permitted treatment capacity of 16.5 mgd, and in 2008 received daily average daily flows of approximately 12.9 mgd (the highest average daily volumes occurred in 2005, when average daily flows were approximately 14.2 mgd). Thus the treatment plant currently has a remaining treatment capacity of approximately 2.3 to 3.6 mgd. In addition, the master plan for wastewater treatment plant provides for incremental plant expansions planned which will provide adequate treatment capacity for growth within the service area as it occurs, to a currently planned treatment capacity of 22.7 mgd. Incremental improvements to the District's facilities are provided through its comprehensive five-year Capital Improvement Program (CIP). The CIP is updated annually to ensure that expansions and upgrades to treatment, collection, and conveyance facilities are provided as needed and that the rate structure is adjusted to ensure that financial resources are available to implement the improvements when needed. As such, the existing remaining treatment capacity, along with the implementation of the District's master plans and CIPs, are expected to provide sufficient wastewater treatment capacity to accommodate the cumulative flows generated by the cumulative development within its service area. Therefore, the cumulative impacts to wastewater treatment and disposal systems would be *less than significant*.

With respect to wastewater collection systems, the District and the City both provide for conveyance capacity expansions as needed under their respective master plans. In addition, both the District and the City are in the process of implementing Storm System Management Plans (SSMPs) which are intended to provide for ongoing assessment of conveyance capacity needs and the identification and implementation of capacity upgrades when needed. As such, sufficient capacity would be available in the wastewater collection systems to serve the incremental flows from cumulative development. Therefore, the cumulative impacts to wastewater collection systems would be less than significant.

Based on the above, the cumulative impacts to utilities and service systems would be *less than significant*.

Mitigation. No mitigation required.

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Agencies, Organizations, and Private Individuals Consulted

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M. ENERGY

The CEQA Statutes provide that EIRs shall include a detailed statement on significant effects of a project and “[m]itigation measures proposed to minimize significant effects on the environment, including, but not limited to, measures to reduce the wasteful, inefficient, and unnecessary consumption of energy” (Public Resources Code §21000(b)(3)). CEQA Guidelines Section 15126.2 discusses requirements for an EIR to address potentially significant effects, and although it does not include energy specifically, it mentions use of nonrenewable resources. CEQA Guidelines Section 15126.4(a)(1)(C) requires an EIR to discuss energy conservation measures, if relevant. Appendix F to the Guidelines addresses energy conservation goals, notes that potentially significant energy implications of a project should be considered in an EIR, and contains general examples of mitigation measures for a project’s potentially significant energy impacts.

The following discussion is based on a number of data and information sources. References are indicated by footnotes throughout the section, and are keyed to a list of sources under ‘Endnotes’ at the end of the impact discussion.

ENVIRONMENTAL SETTING

BACKGROUND

Energy usage is typically quantified using the British Thermal Unit (BTU). As points of reference, the approximate amounts of energy contained in common energy sources are: gasoline – 125,000 BTUs per gallon (diesel – 139,000 BTUs per gallon); natural gas – 1,031 BTUs per cubic foot; electricity – 3,413 BTUs per kilowatt hour (kWhr). In terms of food energy, one BTU is equivalent to 0.252 kilocalories (kcal).¹

Total energy usage in California was 8,360 trillion BTUs in 2007, which equates to an average of 232 million BTUs per capita. Of California’s total energy usage, the breakdown by sector is 39 percent transportation, 24 percent industrial, 18 percent residential, and 19 percent commercial. Petroleum satisfies 55 percent of California’s energy demand, natural gas 32 percent, and electricity 12 percent. Coal fuel accounts for less than 1 percent of California’s total energy demand.² Electric power and natural gas in California are generally consumed by stationary users, whereas petroleum consumption is generally accounted for by transportation-related energy use.³

Given the nature of the proposed project as a commercial retail expansion, the remainder of this discussion will focus on the three sources of energy which are most relevant to the project, namely electricity and natural gas for operational uses; and transportation fuel for vehicle trips associated with commercial uses planned for the project.

Electricity

In 2007, California used over 302,000 gigawatt hours of electricity⁴ (of which approximately 836 gigawatts were consumed by residential and non-residential users in the City of Antioch)⁵. This electricity was produced from power plants fueled by natural gas (45 percent), coal (17 percent), large hydro (12 percent), nuclear (15 percent), and renewables (including wind, solar, biomass, geothermal, and

small hydro (12 percent). Approximately 70 percent of the electricity was generated within California, with the balance imported from other western states, Canada, and Mexico.⁶

Electricity usage in California for differing land uses varies substantially by the type of uses in a building, type of construction materials used in a building, and the efficiency of all electricity-consuming devices within a building. The average annual usage of electricity is roughly 14 kWhr/square foot for all retail commercial buildings in the Pacific region.⁷

Demand for electricity fluctuates daily and seasonally. The amount of electricity provided to meet minimum expected electrical demand during a given period is called “base load.” On a daily basis, the demand for electricity is typically higher during the evening, and on a seasonal basis electrical demand is typically highest in summer when air conditioners are in use. The amount of electricity provided during these high demand periods is referred to as “peak load.” Since electricity cannot be effectively stored, peak demands are met by additional electricity that is provided to the grid by peaking power plants or “peaker plants.” Natural gas powered generating plants can be fired up rapidly and thus are often utilized during peak demand times. On rare occasions, such as during extreme heat waves, peak electrical demand can exceed the maximum supply levels that the electrical power industry can generate, resulting in power outages. During the prolonged heat wave of July 2006, scattered power outages occurred but these were largely due to failure of aging local transformers, not inadequate generating capacity.⁸

Natural Gas

In 2007, California used an average of over 6.9 billion cubic feet of natural gas per day (of which approximately 8,534 million cubic feet were consumed by residential and non-residential users in the City of Antioch)⁹. The natural gas was used to produce electricity (50 percent), in industrial uses (18 percent), in commercial uses (9 percent), and in residential uses (22 percent). Approximately 14 percent of the natural gas was produced within California, with the balance imported from other western states (63 percent) and Canada (23 percent).¹⁰

As noted, natural gas is used to generate almost 50 percent of electricity used in California. This results in peak seasonal demands for natural gas not only during the winter months for heating but also during the peak electricity demand period in summer when cooling needs are greatest.¹¹

Natural gas usage in California for differing land uses varies substantially by the type of uses in a building, type of construction materials used in a building, and the efficiency of all gas consuming devices within a building. The average annual usage of natural gas is roughly 30 cubic feet/square foot for all retail commercial buildings in the Pacific region.¹²

Transportation Fuel

In 2007, Californians consumed about 15.7 billion gallons of gasoline and 3.1 billion gallons of diesel fuel.¹³ (Consumption of gasoline and diesel by residential and non-residential users in the City of Antioch was approximately 44.5 million gallons combined.) Over the past 33 years, the average fuel economy for the fleet of new light-duty vehicles (autos, pickups, vans, and SUVs) steadily increased from 13.1 miles-per-gallon (mpg) for the 1975 model year to 20.8 mpg for the 2008 model year.¹⁴

According to the California Energy Commission’s 2005 Integrated Energy Policy Report, the demand for gasoline is expected to increase to 18.2 billion gallons per year by 2025 (or 16 percent over 2007 levels), without greenhouse gas regulations in effect (see below), and to 15.6 billion gallons with the regulations in effect. The annual demand for diesel is expected to grow to 4.9 billion gallons by 2025 (a 63 percent

increase over 2007 levels), with or without the greenhouse regulations.¹⁵ Imports of foreign crude oil, which currently account for approximately 40 percent of supply, will increase as in-state and Alaskan supplies diminish.

California's energy efficiency programs have been effective in reducing the growth in demand for electricity and natural gas. However, in the transportation sector, fuel economy standards were allowed to languish by the federal government until late 2007 when the vehicle fuel efficiency standards were raised for the first time in over 30 years (see 'Regulatory Setting' below).¹⁶

EXISTING CONDITIONS

Electrical Service

The Pacific Gas and Electric Company (PG&E) provides electrical service to the City of Antioch. PG&E generates and distributes electric power to millions of residential and non-residential customers throughout a 70,000 square-mile service area covering much of northern and central California. The power sources used in the generation of electricity include hydro, nuclear, natural gas, coal, and renewable resources like solar, wind, geothermal, biofuel, and small hydro. In 2008, "eligible renewable sources" under California's Renewable Portfolio Standard (RPS) mandate (see 'Regulatory Context' below) produced 11.9 percent of PG&E's electric power¹⁷ while large hydroelectric facilities produced another 16 percent.¹⁸ Some of this electricity is produced by independent power producers in the surrounding region, including hydroelectric power from the Sierra, biogas generated power from the Central Valley, geothermal energy from Lake County and Oregon, and biomass from lumber mills in northern California.¹⁹

Adequate electrical supply is available to the project from transmission and distribution lines in the vicinity. Warren Lau of PG&E's service planning staff indicated that there are no existing or foreseeable supply constraints that would prevent PG&E from meeting the project's average demands or peak daily demands or peak seasonal demands. The company constantly updates demand projections and ensures that adequate power generation is brought on-line when needed. Similarly, transmission and distribution facilities and substations are continuously upgraded and expanded as needed to ensure uninterrupted power delivery. There are no existing or anticipated bottlenecks in the distribution system which would impair PG&E's ability to meet average or peak power demands.

In 2008, a new PG&E substation was completed near the future intersection of Hillcrest Avenue and Sand Creek Road. This new substation will improve the reliability and safety of electric services to southern Antioch, Brentwood, Oakley, and portions of rural East Contra Costa County.

Natural Gas Service

The Pacific Gas and Electric Company (PG&E) provides natural gas service to the City of Antioch. PG&E serves approximately 4 million consumers with natural gas service within a 70,000 square-mile service area in southern and central California. PG&E delivered approximately 900 billion cubic feet of natural gas in 2004.²⁰

Approximately five percent of the company's natural gas supplies originate in California. The remaining 95 percent is piped via high-pressure transmission pipelines from out-of-state gas fields in the Southwest and Rocky Mountain regions, and western Canada. A representative of PG&E's Service Planning Group indicated that there are adequate supplies available from these supply sources and that no interruptions to

supply are anticipated or foreseen which would prevent the utility from meeting the growing demand for natural gas associated with continuing growth in Antioch.²¹

PG&E owns and operates 40,000 miles of distribution pipeline, and 6,000 miles of transmission pipeline.^{22, 23} Most natural gas supplies to Antioch are conveyed through long-distance transmission lines from western Canada. The company owns several large gas storage facilities which are important in balancing supply and demand and maintaining reliability of service. Emergency natural gas supplies for the area are stored at the McDonald Island natural gas storage field to the east of Antioch. Frank Mahoney of PG&E's Service Planning Group indicated that there are no constraints in the natural gas transmission, storage and distribution system which would interrupt the flow of natural gas to the Antioch market. It is the responsibility of PG&E's Service Planning Group to constantly develop projections for growth in demand, including periods of peak demand, and to ensure that adequate supplies and infrastructure are brought online to meet that demand. Natural gas supplies to the proposed project would be delivered via existing 8-inch high pressure pipelines which run adjacent to the site along Lone Tree Way.²⁴

Transportation Fuel

Overall supplies of transportation fuel in Contra Costa County are plentiful and reliable. Five of California's 13 oil refineries are located in the Contra Costa and Solano Counties, all within 30 miles of Antioch. The refineries receive crude oil supplies via pipeline from the Kern County oil fields as well as from two nearby marine terminals which receive tankers from Alaska and foreign oil producers. The refined gasoline and diesel products are transported to Antioch via tanker truck and product pipelines from these refineries.^{25, 26}

There are currently 22 fuel stations in the City of Antioch, and many more in adjacent communities, which supply conventional fuels such as gasoline and diesel.²⁷ There are also several "clean fuel" stations in the area where alternative fuels and energy supplies are available to the public. These include the Black Diamond Vista Chevron in Concord where ethanol (E85) is available; Golden Gate Biofuels in Brentwood where biodiesel is available; two locations in Concord where compressed natural gas (CNG) is available; several locations in Antioch and Brentwood where liquefied petroleum gas (LPG) is available; three locations in Walnut Creek where electric inductive and conductive chargers are available.²⁸

The overall supply picture for transportation fuels in Antioch reflects that of California as a whole. Supplies of imported crude and refined fuels are increasing steadily as in-state petroleum resources decline and refining capacity is maximized. Although there have been no fuel shortages or gas lines in recent years, general tightness of supply vis-à-vis demand is reflected in prices at the pump. Since fuel deliveries are subject to long-term contracts, some oil companies and localities may fare better than others in the event of actual fuel shortages. However, there is no evidence to suggest that such shortages will occur in the foreseeable future.

REGULATORY SETTING

Since the energy crisis of the 1970s, efforts to promote and require energy conservation and alternatives have been embodied by numerous plans, policies, programs, and regulations promulgated at the federal, state, regional, and local levels. Those which are most relevant to the project are briefly described below.

Federal

Energy Policy and Conservation Act

Enacted in 1975, this legislation established fuel economy standards for new light-duty vehicles sold in the United States. The law placed responsibility on the National Highway Traffic and Safety Administration (a part of the U.S. Department of Transportation) for establishing vehicle standards and for regularly updating the standards. The U.S. Environmental Protection Agency (U.S. EPA) administers the Corporate Average Fuel Economy (CAFE) program, which determines vehicle manufacturers' compliance with existing fuel economy standards. Since the inception of the CAFE program, the average fuel economy for new light-duty vehicles (autos, pickups, vans, and SUVs) steadily increased from 13.1 miles-per-gallon (mpg) for the 1975 model year to 20.8 mpg for the 2008 model year.²⁹

Energy Policy Act of 2005

Passed by Congress in July 2005, the Energy Policy Act includes a comprehensive set of provisions to address energy issues. The Act includes tax incentives for the following: energy conservation improvements in commercial and residential buildings; fossil fuel production and clean coal facilities; and construction and operation of nuclear power plants, among other things. Subsidies are also included for geothermal, wind energy and other alternative energy producers. It directs the Department of Energy to study and report on alternative energy sources such as wave and tidal power, and includes funding for hydrogen research. The Act also increases the amount of ethanol required to be blended with gasoline, and extends Daylight Savings time (to begin earlier in Spring and end later in Fall) to reduce lighting requirements. It also requires the federal vehicle fleet to maximize use of alternative fuels. The Act also includes provisions for expediting construction of major energy transmission corridors, such as high voltage power lines, and fossil fuel transmission pipelines. These are just a few examples of the provisions contained in the Act.³⁰

Energy Independence and Security Act of 2007

Signed into law in December 2007, this broad energy bill most notably included an increase in auto mileage standards, and also addressed biofuels, conservation measures, and building efficiency. The bill amended the Corporate Average Fuel Economy (CAFE) standards to mandate significant improvements in fuel efficiency (i.e., average fleetwide fuel economy of 35 miles per gallon by 2020, versus the previous standard of 27.5 mpg for passenger cars and 22.2 mpg for light trucks).³¹ Another provision includes a mandate to increase use of ethanol and other renewable fuels by 36 billion gallons by 2022, of which 21 million gallons is to include advanced biofuels, mainly cellulosic ethanol, that have 50 to 60 percent lower greenhouse gas emissions. The bill also includes establishment of a new energy block grant program for use by local governments in implementing energy-efficiency initiatives, as well as a variety of green building incentives and programs, among other things.³²

EnergyStar Program

In 1992, the US Environmental Protection Agency (EPA) introduced Energy Star as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. The program applies to major household appliances, lighting, computers, and building components such as windows, doors, roofs, heating and cooling systems. Under this program, appliances which meet specifications for maximum energy use established under the program are certified to display the EnergyStar label. In 1996, EPA joined with the Energy Department to expand the program, which now also includes qualifying commercial and industrial buildings, and homes.³³

Income Tax Credits

Federal income tax credits are available to individuals for installation of qualified energy conservation features in the home such as insulation, replacement windows, and certain high-efficiency heating and cooling equipment. Additional tax credits are available for qualified solar water heating and photovoltaic systems, and also for qualified fuel cell and microturbine systems. Tax credits are also available to buyers of designated fuel-efficient vehicles such as hybrid gasoline-electric, diesel, battery-electric, alternative fuel, and fuel cell vehicles. Tax credits are also available to home builders and commercial buildings which incorporate energy-efficient materials, as well as to manufacturers of certain products designed to meet EnergyStar standards.³⁴

State

Energy Action Plan

In 2003, the three key energy agencies in California – the California Energy Commission (CEC), the California Power Authority (CPA), and the California Public Utilities Commission (CPUC) – jointly adopted an “Energy Action Plan” (EAP) that listed goals for California’s energy future and set forth a commitment to achieve these goals through specific actions. In 2005, the CPUC and the CEC jointly prepared Energy Action Plan II to identify the further actions necessary to meet California’s future energy needs. EAP II describes the priority sequence for actions to address increasing energy needs, also known as “loading order.” The loading order identifies energy efficiency and demand response as the State’s preferred means of meeting growing energy needs. After cost-effective efficiency and demand response, the State is to rely on renewable sources of power and distributed generation, such as combined heat and power applications. To the extent that efficiency, demand response, renewable resources, and distributed generation are unable to satisfy increasing energy and capacity needs, the Plan supports the use of clean and efficient fossil-fired generation. The Plan recognizes that concurrent improvements are required to the bulk electricity transmission grid and distribution facility infrastructure to support growing demand centers and the interconnection of new generation, both on the utility and customer side of the meter. The Plan identifies key actions to be taken in all of these areas in order to meet the State’s growing energy requirements. The Plan recommendations are implemented by the Governor through executive orders, by the legislature through new statutes, and by the responsible State agencies through regulations and programs. Progress on Plan implementation is reported in successive biennial updates of the Plan.³⁵

Title 24 (California Energy Code)

The California Energy Code (Title 24, Part 6, of the California Code of Regulations, California’s Energy Efficiency Standards for Residential and Nonresidential Buildings), provides energy conservation standards for all new and renovated commercial and residential buildings constructed in California. The provisions of the California Energy Code apply to the building envelope, space-conditioning systems, water-heating and lighting systems of buildings and appliances, and give guidance on construction techniques to maximize energy conservation. Minimum efficiency standards are given for a variety of building elements including appliances, water and space heating and cooling equipment, and insulation for doors, pipes, walls and ceilings. The Energy Commission adopted the 2005 changes to Building Efficiency Standards which includes emphasis on saving energy at peak periods and seasons, and to improve the quality of installation of energy efficiency measures, among other things. It is estimated that implementation of the 2005 Title 24 standards will result in an increased energy savings of 8.5 percent relative to the previous Title 24 standards. Compliance with Title 24 standards is verified and enforced through the local building permit process.³⁶ The 2008 Title 24 Standards, currently in the rule-making

phase, include added provisions which require “cool roofs” on commercial buildings, increased efficiency in heating, ventilating and air conditioning systems, and increased use of skylights and more efficient lighting systems, among other things.³⁷

Green Building Initiative

In December 2004, the Governor signed Executive Order S-20-04 (Green Building Initiative) to establish energy and resource-efficiency in building construction. The EO sets a goal of reducing energy use in State-owned buildings by 20 percent by 2015, and directs the CEC to refine Title 24 energy efficiency standards for building to meet the same goal.³⁸

California Green Building Standards Code

On July 17, 2008, the California Building Standards Commission adopted a green building code for all new construction statewide. The Code took effect in January 2009 and will be voluntary until 2011, when its provisions are expected to become mandatory. The voluntary period is intended to give builders, local governments and communities time to adapt to the new rules. The code sets targets for energy efficiency, water consumption, dual plumbing systems for potable and recyclable water, diversion of construction waste from landfills and use of environmentally sensitive materials in construction and design, including eco-friendly flooring, carpeting, paint, coatings, thermal insulation and acoustical wall and ceiling panels.

California Greenhouse Gas Bill

The “California Greenhouse Gas Bill” (AB 1493), signed into law in July 2002, requires the California Air Resources Board (CARB) to develop and adopt regulations that achieve maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks.³⁹ In response, CARB adopted landmark regulations in 2004 limiting greenhouse gas emissions from new vehicles sold in California beginning in the 2009 model year. New vehicles complying with this regulation will consume nearly 30 percent less fuel than vehicles built before 2009. The bill includes incentives for vehicle manufacturers to take early action. Assuming these regulations are not overturned in the courts, they could result in significant reductions in the demand for transportation fuel in California.⁴⁰ In December 2007, the U.S. District Court in Fresno upheld California’s right to regulate greenhouse gas emissions.⁴¹ However, later that same month, the U.S. EPA refused to grant California a waiver under the federal Clean Air Act which would have allowed it to enforce the AB 1493 regulations. The EPA position was that the recently increased fuel economy standards under the Energy Independence and Security Act of 2007, passed early the same month, made the California law unnecessary.⁴² However, on January 26, 2009, President Obama issued a memorandum to the EPA requesting that the previous denial of California’s waiver be reassessed and that appropriate action be taken.⁴³ On April 17, 2009, the EPA declared that greenhouse gases “endanger public health and welfare,” setting the stage for the regulation of greenhouse gases under the federal Clean Air Act. However, it is expected to take a number of months before federal greenhouse gas regulations are promulgated.⁴⁴ And on June 30, 2009, the EPA granted California a waiver under the federal Clean Air Act in order to allow enforcement of the AB 1493 regulations.⁴⁵

Million Solar Roofs Bill

The Million Solar Roofs Bill (SB 1), enacted in August 2006, complements the California Solar Initiative established by the Public Utilities Commission in January 2006 with a goal of building a million solar roofs in 10 years. The main components of the bill include: increasing the amount of credit solar customers can receive for excess power generated by their solar systems; mandating solar panels as an

option for new home buyers while their house is being constructed; and mandating that municipal utilities create their own rebate programs.⁴⁶

Renewable Portfolio Standard (RPS)

Originally enacted under SB 1078 in 2002, this bill required electric utility corporations to increase procurement of power generated through eligible renewable energy resources until a target of 20 percent of total generation was reached in 2017. In 2006, SB 17 accelerated this timetable to require the 20 percent renewables target to be reached in 2010.⁴⁷ In November 2008, the Governor signed Executive Order S-14-08 which increases the required renewables content to 33 percent by 2020.⁴⁸ In September 2009, the Governor signed Executive Order S-21-09 which directs the Air Resources Board to adopt regulations consistent with the 33 percent renewable energy target established in Executive Order S-14-08 by July 31, 2010.⁴⁹

California Global Warming Solutions Act of 2006

In September 2006, the Governor signed AB 32 – The Global Warming Solutions Act of 2006, which mandates that California’s greenhouse gas emissions be reduced to 1990 levels by 2020. The Act directs the California EPA to work with state agencies to implement a cap on greenhouse gas emissions (primarily carbon dioxide) from stationary sources of such as electric power generation facilities, and industrial, commercial and waste disposal sectors. Since carbon dioxide emissions are directly proportional to fossil fuel consumption, the cap on emission is expected to have the incidental effect of forcing a reduction in fossil fuel consumption from these stationary sources. Specifically, AB 32 directs the California EPA to work with other state agencies to accomplish the following: 1) Promulgate and implement greenhouse gas emissions cap for the electric power, industrial and commercial sectors through regulations in an economically efficient manner; 2) Institute a schedule of greenhouse gas reductions; 3) Develop an enforcement mechanism for reducing greenhouse gases; 4) Establish a program to track and report greenhouse gas emissions.⁵⁰ (See Section II. N. *Global Climate Change* for a full discussion of AB 32 and its implementation programs.)

City of Antioch General Plan

The General Plan contains the following objective and policies pertaining directly to energy that are relevant to the project:

10.0 Resource Management

10.8.1 Energy Resources Objective

Reduce reliance on nonrenewable energy sources in existing and new commercial, industrial, and public structures

10.8.2 Energy Resource Policies

- a. Continue to implement Title 24 of the State Building Code, and provide incentives to encourage architects and builders to exceed the energy efficiency standards of Title 24 through increased use of passive solar design and day-lighting.
- b. Promote the use of site design, landscaping, and solar orientation to decrease the need for summer cooling and winter heating.

- c. Where feasible, incorporate recycled materials in new construction.
- d. Encourage the installation of energy-efficient lighting, reduced thermostat settings, and elimination of unnecessary lighting in public facilities.
- i. The City shall review all development plans prior to approval to guarantee that energy conservation and efficiency standards of Title 24 are met and are incorporated into the design of the future proposed project.

In addition, policies directed toward efficient land use patterns and transportation networks would have the incidental effect of conserving energy. Other policies would result in more direct energy savings, such as those promoting transit and non-vehicular transportation, and implementation of Transportation Systems Management (TSM) measures. In addition, General Plan policies which address air quality would also have an indirect effect upon energy consumption. (For specific policies, see the ‘Regulatory Setting’ discussions in Sections *II. B. Air Quality* and *II. K. Traffic and Circulation*.)

City of Antioch Municipal Code

The Antioch Municipal Code includes provisions which are directed to conservation of resources, such as water and solid waste, which have the indirect effect of conserving energy.

Title 6, Article I of the Municipal Code requires all commercial operations to segregate recyclables and greenwaste for collection and disposal. In addition, Article II requires that all projects valued at greater than \$75,000 shall provide for the recycling of at least 50 percent of the waste construction and demolition materials.

Article 10 of Title 9 (Planning and Zoning) sets forth requirements for project landscaping and irrigation. Section 9-5.1002 requires installation of automatic irrigation systems and encourages drip irrigation. Section 9-5.1003 requires that plant materials be selected for drought tolerance, adaptability to the local environment, and reduced energy demand. It further requires that plant materials and landscape design be consistent with the City’s water conservation guidelines.

Building Code

The Antioch Building Code is based on the California Building Code of 2007, which includes the Title 24 requirements. Therefore, the Building Code implements the State-mandated energy-efficiency standards for new construction (described above).

Private Sector Energy-Efficiency Incentive Programs

In addition to government policies and programs, the private sector providers of electric power and natural gas to the project offer a number of incentives to encourage reduced energy consumption. The incentives most relevant to the project are described below.

Pacific Gas & Electric

The Pacific Gas & Electric (PG&E) offers a variety of services and programs to assist its customers in achieving greater energy efficiency in their homes and businesses. For businesses, the gas company offers

rebates and other financial incentives in the purchase of energy-efficient equipment and systems. It provides information resources, as well as seminars and design assistance to residential and non-residential builders, including those provided at its Energy Training Center in Stockton. It also offers owner incentives to help offset the cost of energy efficient buildings. The latter are offered as part of the “Savings by Design” program, a comprehensive program sponsored by all the major California utilities to provide educational and financial assistance in the design and construction of new buildings.

Non-Profit Energy Programs

Flex Your Power

Initiated in 2001, “Flex Your Power” is a statewide energy-efficiency marketing and outreach campaign by a partnership of California utilities, businesses, residents, government agencies and nonprofit organizations. Through a variety of media, including utility bill inserts, the objective of the campaign is to educate companies and the public about numerous techniques and products available to increase energy efficiency and to provide information and access to financial incentives, design assistance, and other resources.⁵¹

SIGNIFICANCE CRITERIA

Based on the CEQA Statutes and Guidelines, the project would be considered to result in a significant public services impact if it would:

- Result in the wasteful, inefficient or unnecessary consumption of energy;
- Result in a substantial increase in demand or transmission service, resulting in the need for new or expanded sources of energy supply or new or expanded energy delivery systems or infrastructure.

In addition, Appendix F of the CEQA Guidelines states that the means of achieving the goal of energy conservation includes the following:

- (1) decreasing overall per capita energy consumption,
- (2) decreasing reliance on natural gas and oil, and
- (3) increasing reliance on renewable energy sources.

IMPACTS AND MITIGATION

Project-Specific Impacts

Impact M1. Energy Consumption. The project would increase energy consumption at the project site in the construction and operational phases of the project. However, energy conservation measures incorporated into the design, construction and operation of the project would avoid wasteful, inefficient or unnecessary consumption of energy. **(Less-than-Significant Impact)**

The implementation of the project would consume substantial amounts of energy in both the short-term during project construction and in the long-term during project operation.

The energy use characteristics of the construction and operational phases of the project are discussed in turn below.

Construction Phase Energy Requirements

During construction, the project would consume energy in two general forms: (1) the fuel energy consumed by construction vehicles and equipment; and (2) bound energy in construction materials, such as asphalt, steel, concrete, pipes, and manufactured or processed materials such as lumber and glass. These are discussed below.

Energy Consumed by Construction Vehicles and Equipment

Fossil fuels used for construction vehicles and other energy consuming equipment would be used during site clearing, demolition, grading, and construction for the project. Based on the URBEMIS2007 model output for project construction CO₂ emissions, it was estimated that total diesel fuel consumed during construction would be approximately 905 gallons. (This is equivalent to 125.8 million BTUs.) Fuel energy consumed during construction would be temporary in nature and would not represent a significant demand upon energy resources.

Energy Conservation During Construction

Some incidental energy conservation would occur during construction through implementation of the noise mitigation measures identified in Section *II. I. Noise* of the Draft EIR. For example, there would be some fuel savings resulting from the prohibition of unnecessary idling of vehicles and equipment, and from the requirement that equipment be properly maintained. In addition, the mitigation measures listed in Section *II. B. Air Quality* include a requirement that equipment not in use for more than 5 minutes shall be turned off. Also, given rising fuel prices (and increased cost competition for scarce construction projects during the current economic downturn), contractors and owners have a strong financial incentive to avoid wasteful, inefficient and unnecessary consumption of energy during construction. Additionally, at least 50 percent of waste construction and demolition materials would be recycled or reused, pursuant to City of Antioch requirements.

There is growing recognition among developers and retailers that sustainable construction is not prohibitively expensive, and that there is a significant cost-savings potential in green buildings. According to the Urban Land Institute (ULI), while it costs 10 percent more to construct green buildings than conventional buildings, green buildings generate energy savings of up to 35 percent.⁵² But cost is not the only factor driving the trend toward sustainable buildings. Apart from governmental emphasis on green buildings, retailers and retail developers are beginning to see successful examples of sustainable design in other properties, and they are attracted by the public relations value of green properties.⁵³

Bound Energy Contained in Construction Materials

Substantial reductions in energy inputs for construction materials can be achieved by selecting building materials composed of recycled materials which require substantially less energy to produce than non-recycled materials.

The incremental increase in the use of energy bound in construction materials such as asphalt, steel, concrete, pipes and manufactured or processed materials such as lumber and gas would not substantially increase demand for energy compared to overall local and regional demand for construction materials. The Walmart expansion will use nearly 100 percent recycled structural steel in new construction. This requires 50 percent less energy to manufacture than new steel and eliminates the need to consume energy in ore mining and processing. In addition, all of the plastic baseboards and much of the plastic shelving in the expansion area will be composed of recycled plastic. Therefore, materials used in construction would not involve the wasteful, inefficient or unnecessary consumption of energy.

Operational Phase Energy Use

The operational phase will consume energy for multiple purposes including, but not limited to, building heating and cooling, refrigeration, lighting, electronics, office equipment, and commercial machinery (including kitchen appliances). Operational energy will also be consumed during each vehicle trip associated with these proposed uses. The following discussion of operational energy use begins with a discussion of on-site energy use and conservation measures, which is followed by a discussion of transportation energy use and conservation.

On-Site Energy Requirements

The proposed project would consume energy for interior and exterior lighting, heating/ventilating/air conditioning (HVAC), refrigeration, home electronics systems and appliances, and security systems, among other things.

The project demand for electricity was estimated using the national average of 14 kilowatt hours per square foot per year (kWhr/ft²/yr) for commercial uses. Based on a total floor area of 33,575 square feet for the store expansion, the project demand for electricity would be approximately 470.5 megawatt-hours per year. (This is equivalent to 1.6 billion BTUs per year.) Compared with the total annual electrical demand in the City of Antioch of approximately 836 gigawatt-hours during 2005, the proposed project would represent approximately 0.06 percent of total electrical demand in the City of Antioch.

The project demand for natural gas was estimated using the national average of 30 cubic feet per square foot per year (ft³/ft²/yr). Based on a total floor area of 33,575 square feet for the store expansion, the project demand for natural gas would be approximately 1.01 million cubic feet per year. (This is equivalent to 1.4 billion BTUs per year.) Compared with the total natural gas demand in the City of Antioch of approximately 8,534 million cubic feet during 2005, the proposed project would represent about 0.012 percent of total natural gas demand in the City of Antioch.

On-Site Energy Conservation

In accordance with California Energy Code Title 24, the project would be required to meet minimum energy efficiency standards for non-residential construction. This includes water and space heating and cooling equipment, insulation for doors, pipes, walls and ceilings, and appliances, among other things. The updated 2008 Title 24 Standards include added provisions which require “cool roofs” on commercial buildings, increased efficiency in heating, ventilating and air conditioning systems, and increased use of skylights and more efficient lighting systems, among other things. The project would also be eligible for rebates and other financial incentives from both the electric and gas providers for purchase of energy efficient appliances and systems, which would further reduce the overall operational energy demand of the project. (See ‘Regulatory Setting’ above for details.)

The Walmart store is proposed to include a number of energy-conserving features which exceed the requirements of Title 24. These include the use of skylights, energy-efficient HVAC units, solar-reflective roofing materials, energy-efficient lighting systems, and the reclamation of the “heat of rejection” from refrigeration equipment to generate hot water, among other things. The project currently proposes to include the design features listed below, or equivalent technology that achieves the same or better reductions in energy demand. These features are described in further detail in Section *I. B. Description of the Proposed Project*.

- The expansion area will include skylight/dimming systems which operate to automatically dim lights and ultimately turn them off as daylight increases. This results in an estimated electricity saving of 25 to 35 percent for lighting. During the late night hours, electricity use is reduced by dimming lighting to 65 percent.
- New HVAC units will be “super” high-efficiency packaged HVAC (heating and cooling) units. These units are between 4 to 17 percent more efficient than typical units.
- The expanded store will be equipped with a central energy management system that is monitored and controlled from Walmart headquarters in Bentonville. This enables energy use to be optimized.
- The expansion area will include reclamation of the “heat of rejection” from its refrigeration equipment to generate hot water. This eliminates the need for hot water heaters.
- The building will have white membrane roof with high solar reflectivity, thus lowering the ‘cooling’ load by about 10 percent.
- All lighting in the store will be replaced by energy-efficient T-8 fluorescent lamps and electronic ballasts, which are 30 percent more efficient than required by California code.

- All new internally illuminated building signage would use LED lighting for internal illumination, which is 70 percent more energy-efficient than fluorescent lighting.

These energy-efficiency features would increase overall energy efficiency and would help reduce consumption during periods of peak energy demand.

In addition, a substantial portion of the solid waste generated by Walmart and the other project users would be recycled by a local service provider. In addition, Walmart would enter private contracts for pickup of used cardboard, waste oil, tires, auto batteries, vegetable oil, single-use cameras, electronic waste, etc. The recycling and reuse of these materials would save substantial energy inputs required to produce goods from virgin materials.

The proposed expansion also includes high-efficiency plumbing fixtures such as faucets, toilets and urinals. The resulting reduction in water use would help conserve energy in the development, pumping and conveyance of water supplies.

In addition, with the passage of AB 32 – California Climate Act of 2006, it is expected that greenhouse caps applied to electrical generating stations will force a reduction in the use of fossil fuels for power generation, and their replacement with more renewable power sources.

In this context, it is worth noting that in 2008 PG&E obtained 11.9 percent of its power supply from renewable sources such as solar, wind, and geothermal, and small hydro, and currently holds contracts for renewable energy deliveries that represent more than 20 percent of its future energy needs.⁵⁴

Effects of Global Climate Change on Project Energy Use

With the expected increase in average temperatures due to global climate change, project energy demand for air conditioning and water demand for landscape irrigation will likely increase but this is not expected to have a significant impact on the project. Higher summer temperatures will result in greater power demands for air conditioning. At the same time, reduced summer meltwater flows in the Sierra will result in reduced hydroelectric power generation during the peak summer period which will need to be replaced by other more-expensive power sources. Rising energy costs will likely result in an even greater emphasis on energy efficiency and conservation. The expanded Walmart will include high-efficiency HVAC units which would help meet increased cooling demands while using less energy than conventional systems. Thus, apart from potentially increased energy costs, global climate change will not have a significant impact on the project.

Transportation Energy Use

The project would generate demand for transportation fuel for vehicles traveling to the retail and restaurant uses of the site. This includes passenger vehicle trips by customers and employees as well as delivery truck trips. According to the traffic study by Kimley-Horn & Associates Transportation Engineers, the store expansion would result in a net increase of approximately 1,590 daily vehicle trips on an average weekday (including delivery truck trips)⁵⁵. Based on URBEMIS computer model output for the EIR air quality analysis, the

total vehicles miles traveled to and from the project daily would be approximately 11,754 miles.⁵⁶ (Note: The average trip length of 7.4 miles applied by the URBEMIS model reflects statewide averages, and is considered very conservative for the Antioch urban context. While the average customer trip likely would be far shorter than the state average, this would be somewhat balanced by average delivery truck trip lengths which would likely be longer than the state average.) Applying the current national average vehicle fuel consumption rate of about 20 miles per gallon, the project would result in consumption of approximately 588 gallons of fuel per day (or 0.37 gallons per vehicle trip, on average). It is conservatively assumed that the daily consumption rate reflects average daily consumption throughout the year, the annual demand for transportation fuel associated with the project would be 214,620 gallons. (This is equivalent to 26.8 billion BTU per year.) Compared with the total transportation fuel consumption in the City of Antioch of approximately 51.6 million gallons during 2006, the proposed project fuel use would be equivalent to about 0.4 percent of total transportation fuel use in the City of Antioch.⁵⁷

These fuel consumption rates are expected to decline as older less fuel-efficient vehicles are retired, and as the new federal vehicle fuel efficiency standards work to increase gas mileage through the vehicle fleet over time (see 'Regulatory Setting' above). There is also evidence of declining fuel consumption due to fewer miles traveled both in California and the nation as a whole. Consumption of gasoline in California declined 7.5 percent in June 2008 from the same month a year earlier, according to figures from the State Board of Equalization. In addition, sales of hybrid vehicles are growing rapidly and in July 2008 comprised approximately 2.4 percent of vehicle sales nationally.⁵⁸

Transportation Energy Conservation

Due to their nature as automobile-oriented land uses, regional commercial retailers do not readily lend themselves to the use of alternative transportation modes. As such, there is limited potential for reducing overall transportation energy consumption, or of specifically reducing use of fossil fuels in transportation, in conjunction with this project. However, the project would include opportunities for transit use with bus routes running along Lone Tree Way and Hillcrest Avenue, including nearby bus stops on both routes. (It is estimated by Kimley-Horn and Associates that the Walmart expansion will generate six transit passengers in the AM peak hour and no riders in the PM peak hour.) In addition, bicycle racks would be installed in conjunction with the expansion project. The opportunities for transit, pedestrian, and bicycle use in conjunction with the project would help provide some reduction in overall vehicle miles traveled, particularly by employees, and thereby reduce consumption of transportation fuel by private vehicles.

While the availability of these alternatives will have some effect in reducing energy use associated with the project, the dominant transportation mode used by employees, customers and suppliers will be petroleum-fueled vehicles. However, the general tightness of fuel supply, and resulting high fuel costs, may have the beneficial effect of facilitating greater use of non-individual vehicle use, or more prudent travel patterns for vehicle use, and accelerated development and adoption of vehicles which are more fuel-efficient or which rely on alternative fuel sources.

Conclusion

In summary, the operation of the project would result in the consumption of about 29.8 billion BTU of electricity, natural gas, and transportation fuel per year. The energy consumed by the project operation would represent 0.17 percent of the total annual energy consumption in the City of Antioch of about 17,215 billion Btu, and about 0.004 percent of statewide energy consumption. Although not accounted for in the above estimates, there are a number of energy conservation measures which will be incorporated into the design, construction, and operational aspects of the project, as discussed above, which would result in a considerable reduction in project energy consumption, particularly electricity.

In conclusion, the project would not result in a significant impact to energy resources since it would result in the consumption of relatively small amounts of energy, compared to local and statewide consumption rates, in both the construction and operational phases, and because the energy conservation measures incorporated into the design and operation of the project would avoid wasteful, inefficient or unnecessary consumption of energy. Therefore, the impact of the project upon energy resources would be *less than significant*.

Mitigation. No mitigation required.

Impact M2. **Impact on Energy Supplies and Infrastructure.** The increased demand for energy resulting from the project would not be substantial enough to require new or expanded sources of supply or the construction of new or expanded energy delivery systems or infrastructure capacity. (Less-than-Significant Impact)

Electrical Power Supplies and Infrastructure

The operational electricity use for the proposed project would be approximately 436.48 megawatt-hours per year. With an annual electrical demand of 836 gigawatt-hours in Antioch during 2005, the proposed project would result in an increase of about 0.05 percent in electrical power demand. Warren Lau of PG&E's service planning staff indicated that there is sufficient power available to Antioch to meet the electrical energy demands of the project during normal and peak periods of demand. PG&E was able to meet the unusually high power demands associated with the extended heat wave of July 2006 (although localized power outages occurred due to failure of aging transformers), and has ample reserve capacity to meet similar or greater demands on its facilities and supplies. As mentioned previously, PG&E constantly updates demand projections and ensures that adequate power generation is brought on-line when needed. Similarly, transmission and distribution facilities and substations are continuously upgraded and expanded as needed to ensure reliable power delivery. There are no existing or anticipated bottlenecks in the distribution system which would impair PG&E's ability to meet average or peak power demands of the City of Antioch or the proposed project.

Natural Gas Supplies and Infrastructure

During operations, the project would use approximately 1.24 million cubic feet of natural gas per year. Compared with the total natural gas demand in the City of Antioch of approximately 8,534 million cubic feet during 2005, the proposed project would represent about 0.015 percent of total natural gas demand in Antioch. As discussed previously, natural gas supplies to the proposed project would be delivered via existing 8-inch high pressure pipelines which run adjacent to the site along Lone Tree Way. PG&E's service planning staff has indicated that there are sufficient supplies of natural gas available to Antioch and there is adequate reserve capacity in the long-distance transmission pipeline network, the local storage facilities, and in the local distribution system to serve the project during normal and periods of peak demand. Therefore, there are no constraints in the sources of supply or in the delivery infrastructure which would impinge upon the ability of PG&E to meet the project demand for natural gas, during normal and peak demand periods, for the foreseeable future.

Transportation Fuel Supply and Infrastructure

The overall supply picture for transportation fuels in Antioch reflects that of California as a whole. Supplies of imported crude and refined fuels are increasing steadily as in-state petroleum resources decline and refining capacity is maximized. Although there have been no fuel shortages or gas lines in recent years, general tightness of supply vis-à-vis demand is reflected in prices at the pump. Since fuel deliveries are subject to long-term contracts, some oil companies and localities may fare better than others in the event of actual fuel shortages. However, there is no evidence that such shortages will occur in the foreseeable future. As such, no fuel shortages are anticipated which would constrain transportation to or from the project. Likewise, there is no evidence of infrastructure deficiencies in the fuel supply distribution system which would result in local fuel shortages affecting the project.

Conclusion

In conclusion, the energy requirements associated with the project would not exceed the energy supplies available to the project or exceed the ability of the various energy infrastructures to provide adequate supplies of energy to the project, during normal and peak demand periods, for the foreseeable future. As such, no new energy supplies would need to be developed to serve the project, and no system improvements to the energy delivery infrastructure would be required in order to serve the project. Therefore, the impact of the project upon energy supplies and energy delivery infrastructure would be *less than significant*.

Mitigation. No mitigation required.

Cumulative Impacts

Impact M3. Cumulative Energy Impacts. The combined energy use by the proposed project and the other cumulative projects would not result in cumulatively significant impacts in terms of wasteful, inefficient or unnecessary use of energy; nor would the combined energy demand from these projects be substantial enough to require new or expanded sources of supply or the construction of new or expanded energy delivery systems or infrastructure capacity. (Less-than-Significant Cumulative Impact)

Geographic Scope of Analysis of Cumulative Energy Impacts

Energy impacts occur at the project level (for consumption efficiency impacts) and at the regional or state-wide level (for supply and infrastructure impacts). For this EIR, the study area for the analysis of cumulative energy impacts is defined as the City of Antioch Planning Area. Within this study area, the list of approved, pending, and reasonably foreseeable projects within the City (see Table 2), which includes most of the City's currently approved, pending, and reasonably foreseeable projects, serves as a well-defined basis for the analysis of near-term cumulative impacts.

Cumulative Impact Analysis

The other cumulative projects in the City of Antioch would result in incremental increases in the total quantity of energy required to serve them. Collectively, the operational energy use for the cumulative projects (including the proposed project) would result in a total energy demand several times the energy demand estimated above for the proposed project. All of these projects would be served by the same energy supply sources and infrastructure as the proposed project, and all would be subject to the same statutes, regulations, and programs which mandate or encourage the energy conservation and the development of alternative energy sources. There is no evidence to suggest that these cumulative projects, either individually or collectively, would result in the wasteful, inefficient or unnecessary consumption of energy, or would be subject to energy infrastructure constraints which would affect delivery of energy supplies to those projects. Therefore, the cumulative energy impacts associated with the project would be *less than significant*.

Mitigation. No mitigation required.

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N. GLOBAL CLIMATE CHANGE

GENERAL OVERVIEW OF CLIMATE CHANGE

In general terms, Global Climate Change (GCC) can be characterized as a change in the average weather of the earth as evidenced by changes in temperature, precipitation, wind patterns, and the frequency and intensity of storms. Under natural conditions, global temperatures are modulated by naturally-occurring atmospheric gases, such as water vapor carbon dioxide, methane and nitrous oxide. These gases allow sunlight to penetrate the atmosphere, but then absorb some of the heat radiated outward from the earth's surface thus preventing it from escaping into outer space. As these atmospheric gases warm, they radiate the heat back to the surface to create "greenhouse" effect, and thereby influence the Earth's energy balance. Without this natural heat-trapping effect, the earth's average surface temperature would be about 60 degrees cooler. The emission of greenhouse gases occurs as a result of both natural processes and human activities. Under natural conditions, carbon dioxide is constantly produced by decay of biological material, and then reabsorbed by growing vegetation and oceans.

The evidence in the geological record shows that the global climate is dynamic and subject to repeated episodes of gradual warming and cooling over very long time periods. These gradual fluctuations in global temperature have, until recently, occurred at a generally consistent rate and within a consistent range of high and low average temperatures. However, since the beginning of the Industrial Age 150 years ago, the rise in average temperatures has increased at a rate dramatically greater than has previously occurred under natural conditions. This extraordinary temperature rise is attributable to the increased emission of greenhouse gases, primarily carbon dioxide, which are produced as a byproduct of the combustion of coal, oil, and natural gas for energy. Another major contributor has been the widespread destruction of forests, often by burning, to accommodate urban centers and agriculture. Atmospheric concentrations of carbon dioxide, which accounts for approximately 85 percent of total greenhouse gas emissions, have risen 30 percent in the past 100 years. The atmospheric concentration of carbon dioxide in 2005 was 379 ppm (parts per million) which exceeds by far the natural range over the last 650,000 years (180 to 300 ppm) as determined from ice cores. Similar trends are also evident for methane and nitrous oxide.¹ The rate of increase in carbon dioxide emissions since the start of the industrial revolution is 200 times greater than the accumulation rate over the 15,000 years since the last ice age.² Because greenhouse gases persist and mix in the atmosphere, emissions anywhere in the world affects climate everywhere.

As mentioned, some of the carbon dioxide in the atmosphere is absorbed by growing vegetation and oceans. While vast amounts of carbon dioxide are removed by these carbon "sinks," this represents a very small portion of carbon dioxide that is emitted into the atmosphere from human sources.³ For example, the California Air Resources Board (CARB) has estimated that carbon absorption by the state's forests provides less than a 2 percent offset to CO₂ emissions from anthropogenic sources (i.e., produced by human activities).⁴

During the past 100 years, average global temperatures have risen by more than one degree Fahrenheit (F). Eleven of the last 12 years (1995-2006) rank among the 12 warmest years on record since scientifically accurate measurements began in 1850.⁵ The greatest temperature increases have occurred at the poles, with up to a 9 degree increase observed in large areas of the Arctic over the past 100 years. This has resulted in net loss in polar ice and alpine glaciers, which combined with thermal expansion of ocean water due to warming, has resulted in a rise of sea levels (which rose an average of seven inches in the last century). Other observed effects include: lengthened growing seasons and earlier plant flowering; gradual migration of animal and plant species toward higher latitudes and altitudes; a decline in plant and animal species adapted to cold temperatures; and an increase in species adapted to warm temperatures.⁶

In 1988, the United Nations established the Intergovernmental Panel on Climate Change (IPCC) to evaluate the impacts of global warming and to develop strategies that nations could implement to curtail global climate change. The IPCC, which is composed of an international group of scientists and representatives of 113 governments, has released four reports over the past 19 years, culminating in the publication in February 2007 of its Fourth Assessment Report on Climate Change (4AR). In 4AR, the IPCC for the first time states that “warming in the climate system is unequivocal” and that most of the global climate change currently underway is “very likely” caused by human activity.⁷ Significantly, the National Oceanic and Atmospheric Administration (NOAA) has also conducted numerous tests using complex computer models and concluded that “2006 warmth was primarily due to human influences.”⁸

The IPCC reported that over the next century, average global temperatures are predicted to increase 1.1 to 6.4 degrees Celsius (2 to 11.5 degrees Fahrenheit), depending on the scenario. Corresponding sea levels are expected to rise from 0.2 meters (8 inches) to 0.6 meters (24 inches), with an additional 4 to 8 inches possible depending on the rate of melting of polar ice sheets. (There is an increasing concern that an average temperature increase of over 2 degrees C (3.6 degrees F) would increase the risk of abrupt climatic changes and sea level rise.)⁹ Based on recent historical acceleration of ice sheet melting, it has been suggested that the IPCC projection may underestimate sea level rise this century by half.¹⁰ In the event of total elimination of the Greenland Ice Sheet, which now seems increasingly likely, sea levels could ultimately rise by 7 meters (23 feet) which would be consistent with sea levels during the last interglacial period which were 6 meters above current levels.¹¹ If both the Greenland and Antarctic Ice Sheets were to disappear, the total sea level rise could be over 200 feet.¹²

Climate Change Effects in California

In June 2005, the Governor of California issued Executive Order S-3-05 (EO) which established climate change reduction targets for the state (these are discussed in detail subsequently). The Order also mandated the preparation of a report to specifically address impacts of climate change in California, identify mitigation measures to reduce emissions, and include adaptation measures the state can implement to best respond to the adverse effects of climate change. In response to the EO, the Secretary of the California Environmental Protection Agency (Cal/EPA) created the California Climate Action Team (CAT) which is comprised of representatives of various state agencies, departments, boards and commissions. In March 2006, CAT released a report of its findings, entitled the *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. The report concludes that the following range of impacts are expected to occur by the end of the century under medium to high carbon dioxide emissions scenarios, and corresponding temperature rise scenarios:¹³

- A 70 to 90 percent loss in Sierra snowpack, resulting in potential water shortages and up to a 30 percent decrease in hydroelectric generating capacity;
- Up to 2.5 times the number of critically dry years;
- Increased challenges for the state’s important agriculture industry from water shortages, vulnerability of certain crops to increasing temperatures, increases in pathogens and pests, and saltwater intrusion into the Delta.
- Adverse effects on winter recreation facilities due to reduced ski season and possible elimination of minimum snow conditions for ski resort operation under higher temperature scenario;
- An increase in average temperatures of 5.5 to 10.4 degrees F, resulting in up to 4 times as many heatwave days in urban centers and up to 10 times as many heat-related deaths
- An over 85 percent increase in the number of days conducive to ozone formation, and consequent impacts on public health;

- A 14 to 33-inch rise in sea levels, increased coastal erosion, increased sea water intrusion into the Sacramento River Delta, and increased flooding potential which would further jeopardize levees and other structures);
- An increase of up to 20 percent in electricity demand, particularly in the hot summer months;
- Over 30 percent decrease in forest productivity, and increased vulnerability due to pest infestation;
- Over 55 percent increase in risk of large wildfires.

In addition, the changes predicted for California's climate over the next century are expected to result in impacts to biological resources, including habitat modification or loss, and impacts to sensitive plant and animal species. Wherever applicable, these potential effects of climate change are discussed in the respective topical discussion to which they relate, e.g., hydrology, biological resources, water supply.

The draft California Climate Adaptation Strategy report, which was released in August 2009 pursuant to EO S-3-05, includes a detailed summary of research on the effects of global change undertaken since the publication of the 2006 CAT report summarized above.¹⁴ The main findings of the Climate Adaptation Strategy Report with respect to seven impact categories are summarized below.

Public Health: More severe weather events, including increases in ambient air temperature and increases in extreme heat events would result in potential health impacts such as heat stroke, heat exhaustion, and the exacerbation of existing medical conditions such as cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy. Climate change is expected to result in an overall decline in air quality resulting in increased mortality due to cardiovascular and lung disease particularly among the elderly, as well as health impacts to infants and young children. Increased potential for flooding will increase the risk of direct injury and/or mortality, loss of property and belongings and the emotional trauma associated with them. Climate changes also potentially result in increases in allergenic plant pollen, more frequent wildfires, and altered environmental conditions that foster the spread of communicable and vector-borne diseases.

Biodiversity and Habitat: Temperature-sensitive terrestrial plant and animal species must adapt to warmer temperatures either within their existing ranges or move to new habitats at higher altitudes or latitudes if possible. Similar stresses and barriers apply to aquatic species. The problem of invasive species is likely to increase and worsen climate-related imbalances in ecosystem dynamics. Changes in precipitation patterns will alter stream flow and severely affect fish populations during their life cycle. Heightened risk and severity of wildfires increases the risk of vegetation and habitat conversion, spread of invasive species and losses in biodiversity. Sea-level rise may result in the loss of substantial areas of critical habitat for a variety of coastal species.

Ocean and Coastal Resources: Sea-level rise will increase the risks of coastal flooding in low-lying areas, inundating private property and public facilities more frequently and exposing more people and more assets to flooding risks. Loss of wetland, beach, and other coastal habitat will negatively impact many fish, bird, and other species, and diminish biodiversity. Warmer water temperatures will cause shifts in the distribution of coastal and marine species; southern species may extend their range northward. Fewer, but possibly more intense, rainstorm events will produce high runoff and flooding. High runoff may overwhelm storm drains and sewage treatment plants, potentially contaminating coastal ecosystems and beaches. Sea-level rise will increase saltwater intrusion into coastal aquifers, degrading agricultural land and coastal groundwater resources.

Water Management: Higher temperatures will melt the Sierra snowpack earlier and drive the snowline higher, resulting in less snowpack to supply water during the dry months. A growing proportion of

winter precipitation will fall as rain instead of snow. Intense rainfall events will result in more frequent and/or more extensive flooding. Droughts are likely to become more frequent and persistent. Increased flooding and sea-level rise increase the probability of levee failures in the Sacramento-San Joaquin Delta. Saltwater intrusion into estuaries, bays, and coastal groundwater resources will diminish water quality, transform ecosystems and reduce freshwater supplies.

Agriculture: Climate change is likely to alter precipitation amounts and patterns, average as well as maximum and minimum temperatures, pest and weed ranges, the length of the growing season, and other factors. The resulting critical changes in water availability, temperatures, sea level rise and extreme events will all affect crop and livestock productivity. There is an increased risk of declining yields of almost all crops. Livestock is particularly at risk from heat extremes, which can lead to increased risk of mortality, lower productivity, and lower reproductive success.

Forestry: Warmer weather, reduced snowpack and earlier snowmelt can be expected to increase fuel hazards and ignition risks. Increased risk in wildfire frequency, intensity and extent will increase public safety risks, property damage, fire suppression and emergency response costs to government, watershed and water quality impacts, vegetation conversions and habitat fragmentation. Climate change may result in expansions of some forest and woodland types, contraction of others, and conversions to brush and grassland habitats. These will affect biodiversity and may impact habitat availability, quality and connectivity, and may result in increased establishment of non-native species, particularly in rangelands where invasive species are already a problem.

Transportation and Energy Infrastructure: Higher average temperatures and higher summer peaks will greatly affect energy production, distribution (transmission), and demand with increased cooling demand likely to far outpace reductions in heating demand in the winter. Higher temperatures, together with a drying climate and less snowpack, will decrease the amount of water available for hydropower generation, especially in high-elevation systems. The risk of outages is likely to increase. More winter precipitation falling as rain instead of snow will result in extreme flows that will require reservoir operators to release more water, causing undesired spills and retaining less water for the dry months. As sea level rises at a faster pace and coastal storm surges increase, existing fortifications will be increasingly inadequate and need to be raised, and areas previously not at-risk will become at risk. The economic cost associated with the required alteration, fortification, or relocation of existing infrastructure is likely to be in the tens of billions. The Bay-Delta levee system, for example, is exposed to increases in the intensity and coincidence of river flooding-related forces combined with increased sea-level rise-related bayside stress.

The potential impacts of climate change upon the proposed project are discussed in Section *III. Effects Found Not To Be Significant*.

ENVIRONMENTAL SETTING

There are six common Greenhouse Gases (GHGs) which are recognized under AB 32 (discussed below) and the Kyoto Protocol (discussed below). These include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Increases in carbon dioxide emissions are primarily a result of fossil fuel use and land use, while increases in methane and nitrous oxide emissions are primarily due to agriculture. HFCs are used in automobile air conditioners and refrigerants, while PFCs and SF₆ are the products of industrial processes. (HFCs are used in refrigeration systems as substitutes for CFCs, which were banned for destroying the ozone layer.) Each of these gases contributes to global warming at a different rate. For example, methane has a “global warming potential” (GWP) 23 times greater than an equivalent amount of carbon dioxide. For purposes of

maintaining GHG inventories in common units, carbon dioxide has been designated as the reference gas, and quantities of other GHGs are translated into carbon dioxide equivalents according to their GWPs. Thus each unit of carbon dioxide is assigned a GWP of one, while methane has a GWP of 23, nitrous oxide has a GWP of 296, and sulfur hexafluoride has a GWP of 22,000. To calculate total emissions for the various greenhouse gases, the quantities are converted to CO₂ equivalents, or CO₂E. Very large quantities or emissions are reported in million metric tons of CO₂E, or MMTCO₂E.¹⁵

State and Local Greenhouse Gas Emissions

According to the California Energy Commission, California is the second largest emitter of greenhouse gases in the U.S. (trailing only Texas) and the 12th largest in the world.¹⁶ In 2004, California produced 484 million metric tons of total carbon dioxide-equivalent emissions.¹⁷ California has relatively low carbon emissions intensity, however, ranking fourth lowest of the 50 states in carbon dioxide emissions per capita from fossil fuel combustion in 2001. California was also the fifth lowest of the 50 states in carbon dioxide emission from fossil fuel combustion per unit of gross state product in 2001, largely as a result of the state's energy efficiency and renewable energy programs.¹⁸

In the Bay Area, GHG inventories for the nine-county Bay Area have been prepared by the Bay Area Air Quality Management District for the base years 2002 and 2007. For 2007, the total greenhouse gas emissions in the Bay Area were estimated to be 102.6 million metric tons of carbon dioxide equivalents, of which Contra Costa County's share was 32.0 million metric tons. No GHG inventory has been prepared for the City of Antioch.¹⁹

REGULATORY CONTEXT FOR GLOBAL CLIMATE CHANGE

International

International efforts to address global climate change have been ongoing since the 1980s. Following the signing of the Montreal Protocol in 1987, the United Nations in 1988 established the Intergovernmental Panel on Climate Change (IPCC); and in 1994, the United States joined other countries around the world in signing the United Nations' Framework Convention on Climate Change (UNFCCC) agreement with the goal of controlling greenhouse gas emissions. In 1997, this international treaty on climate change was amended by the Kyoto Protocol, which assigned mandatory greenhouse gas emission limitations on signatory nations. The United States has not ratified the protocol, which entered into force in February 2005. The Kyoto Protocol is due to expire in 2012, and participating nations are currently negotiating a new long-term international climate change agreement, set to be concluded in Copenhagen in late 2009.²⁰

Federal

In 1992, Congress enacted the Global Climate Protection Act, which mandated that the carbon dioxide emissions levels be frozen to 1990 levels by 2000. In 1993, President Clinton introduced the Climate Change Action Plan as a follow-up to the UN Framework on Climate Change and the federal Global Climate Protection Act. Although both initiatives called for a reduction in carbon dioxide emissions, the U.S. Environmental Protection Agency (U.S. EPA) has claimed that it did not have authority or responsibility under the Clean Air Act for regulating greenhouse gas emissions from motor vehicles, a major contributor to global warming. However, in April 2007 the US Supreme Court (in *Massachusetts v. U.S. EPA*) held that U.S. EPA has statutory authority and an obligation to regulate greenhouse gas emissions from motor vehicles.²¹ In response, the EPA released an "endangerment finding" on April 17, 2009. The agency declared that that greenhouse gases "endanger public health and welfare," setting the stage for the

regulation of greenhouse gases under the federal Clean Air Act. However, it is expected to take a number of months before federal greenhouse gas regulations are promulgated.²²

On June 26, 2009, the U.S. House of Representatives passed H.R. 2454: The American Clean Energy and Security Act of 2009. Known as the Waxman-Markey Act, the legislation would require the U.S. to reduce carbon dioxide and other greenhouse gas emissions by 17 percent from 2005 levels by 2020 and by about 80 percent by 2050. The U.S. Senate is expected to pass climate change legislation in early 2010.²³

Although no regulations have yet been promulgated at the federal level which directly require reduction of greenhouse gas emissions, there are a number of federal energy conservation programs and mandates, discussed in Section *N. Energy*, that have the indirect effect of reducing carbon dioxide emissions through the reduction fossil fuel consumption (e.g., Energy Policy Act of 2005; Energy Independence and Security Act of 2007; EnergyStar program; tax incentives).

State

California Climate Action Registry

In October 2000, the California Climate Action Registry was established by SB 1771 as a non-profit public/private partnership that serves as a voluntary GHG registry to protect, encourage, and promote early actions to reduce GHG emissions. Participants in the Registry calculate their direct and indirect emissions of GHG, based on a General Protocol developed by the Registry. Direct emissions are associated with onsite combustion, manufacturing processes, and company-owned transportation fleets. Indirect emissions are associated with electricity and steam consumption. The State of California has indicated that it will try to ensure that participants receive appropriate consideration for early actions in the event of any future state, federal, or international GHG regulatory scheme. The state also collaborates on The Climate Registry, which is composed of 39 states, 7 Canadian provinces, 6 Mexican states, as well as 3 Indian tribes.²⁴

California Greenhouse Gas Bill (AB 1493)

The “California Greenhouse Gas Bill” (AB 1493), signed into law in July 2002, requires the California Air Resources Board (CARB) to develop and adopt regulations that achieve maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks.²⁵ In response, CARB adopted landmark regulations in 2004 limiting greenhouse gas emissions from new vehicles sold in California beginning in the 2009 model year. New vehicles complying with this regulation will consume nearly 30 percent less fuel than vehicles built before 2009. CARB estimates that the regulation will reduce climate change emissions from the light duty passenger vehicle fleet by 18 percent in 2020 and by 27 percent in 2030.²⁶ In December 2007, the U.S. District Court in Fresno upheld California’s right to regulate greenhouse gas emissions.²⁷ However, later that same month, the U.S. EPA refused to grant California a waiver under the federal Clean Air Act which would have allowed it to enforce the AB 1493 regulations. The EPA position was that the recently increased fuel economy standards under the Energy Independence and Security Act of 2007, passed early the same month, made the California law unnecessary.^{28 29} However, on January 26, 2009, President Obama issued a memorandum to the EPA requesting that the previous denial of California’s waiver be reassessed and that appropriate action be taken³⁰. On April 17, 2009, the EPA declared that greenhouse gases “endanger public health and welfare,” setting the stage for the regulation of greenhouse gases under the federal Clean Air Act. However, it is expected to take a number of months before federal greenhouse gas regulations are promulgated.³¹ And on June 30, 2009, the EPA granted California a waiver under the federal Clean Air Act in order to allow enforcement of the AB 1493 regulations.³²

Renewable Portfolio Standard (RPS)

Originally enacted under SB 1078 in 2002, this bill required electric utility corporations to increase procurement of power generated through eligible renewable energy resources until a target of 20 percent of total generation was reached in 2017. In 2006, SB 107 accelerated this timetable to require the 20 percent renewables target to be reached in 2010.³³ In November 2008, the Governor signed Executive Order S-14-08 which increases the required renewables content to 33 percent by 2020.³⁴ In September 2009, the Governor signed Executive Order S-21-09 which directs the Air Resources Board to adopt regulations consistent with the 33 percent renewable energy target established in Executive Order S-14-08 by July 31, 2010.³⁵

Executive Order S-3-05

In June 2005, the Governor signed Executive Order S-3-05 (EO), which established the following climate change reduction targets for the state: by 2010, reduce greenhouse gas (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. As discussed above, the EO also requires the Secretary of Cal/EPA to prepare biannual reports on the impacts to California of global warming, and on mitigation and adaptation plans to combat these impacts.³⁶ The first report, which was released by the California Climate Action Team (CAT) in March 2006, identified climate change impacts anticipated for California, as discussed above. The CAT report also included detailed recommendations for emission reduction strategies. The recommendations include a wide array of measures, some of which had previously been enacted, such as AB 1493 (see above), and all of which are within the existing authority of the state agencies represented on the CAT.³⁷ (These measures are summarized in Table 12 under 'Impacts and Mitigations' below.) The CAT Report indicates that reporting of emissions is critical to ensure that decision-making is based on real emissions and emission reductions.

Million Solar Roofs Initiative

The Million Solar Roofs Bill (SB 1), enacted in August 2006, complements the California Solar Initiative established by the Public Utilities Commission in January 2006 with a goal of building a million solar roofs in 10 years. The main components of the bill include: increasing the amount of credit solar customers can receive for excess power generated by their solar systems; mandating solar panels as an option for new home buyers while their house is being constructed; and mandating that municipal utilities create their own rebate programs.³⁸

California Global Warming Solutions Act of 2006 (AB 32)

In September 2006, the Governor signed AB 32 – The California Global Warming Solutions Act of 2006, which requires the California Air Resources Board (CARB) to adopt regulations by January 1, 2010 to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions from sources or categories of sources, such that GHG emissions are reduced to 1990 levels by 2020.³⁹ The types of reduction measures identified in the Act include: direct emission reduction measures, alternative compliance measures, market-based compliance mechanisms, and potential monetary and non-monetary incentives. The Act sets forth the following implementation actions which are to occur on or before the following dates:

- June 30, 2007 – Adopt a list of discrete and early action greenhouse gas reduction measures (done – see below);
- January 1, 2008 – Determine what the statewide greenhouse gas emissions level was in 1990 (done – see below);
- January 1, 2008 – Adopt mandatory greenhouse gas reporting rules for significant greenhouse gas sources (done – see below);
- January 1, 2009 – Adopt a scoping plan for achieving the 2020 cap on greenhouse gas emissions through regulations, market mechanisms and other actions;
- January 1, 2010 – Adopt enforceable regulations to implement the early action reduction measures;
- January 1, 2011 – Adopt greenhouse gas emission limits and emission reduction measures by regulation to achieve the 2020 statewide greenhouse gas emissions limit;
- January 1, 2012 – Greenhouse gas reduction measures become operative.

In mid-2007, CARB adopted 44 early actions for emissions reduction over an array of sectors. Some of the measures include: low carbon fuel standard, landfill methane capture, restrictions on high GWP refrigerants, PFC reduction from semiconductor manufacturing, reduction of high GWP GHGs in consumer products, among other things. Cumulatively, these 44 measures are estimated to result in GHG emission reductions of at least 42 million metric tons of CO₂ equivalents, or about 25 percent of the reductions required by 2020. The CARB has until January 1, 2010 to adopt regulations mandating these early reduction measures.⁴⁰

In November 2007, the CARB completed its estimate of 1990 gross GHG levels which was calculated to be 433 MTCO₂E. After deducting 7 metric tons for CO₂ absorbed by forests in the state (“forestry sinks”), the net emissions are estimated to be 427 metric tons. (The emissions sources by sector were: transportation – 35 percent; electricity generation - 26 percent; industrial - 24 percent; residential – 7 percent; agriculture – 5 percent; and commercial – 3 percent.) Thus the figure of 427 metric tons of CO₂ equivalents was established as the emissions limit for 2020, as approved by CARB. (For comparison, CARB’s estimate for baseline GHG emissions for 2000 is 473 million metric tons, and for 2010 it is 532 million metric tons.) Based on CARB’s estimated 2020 GHG levels of approximately 596 million metric tons (for “business as usual” without emissions reductions), the 2020 target reductions will be 173 MMTCO₂E, or a required reduction of about 30 percent from estimated 2020 levels without emissions reductions.⁴¹

In December 2007, CARB approved a regulation for mandatory reporting and verification of GHG emissions from major sources, pursuant to AB 32. The regulation covers major stationary sources such as cement plants, oil refineries, electric generating facilities/providers, and co-generation facilities, which make up 94 percent of the point source CO₂ emissions in California.⁴²

On December 11, 2008, CARB adopted the Climate Change Scoping Plan to reduce greenhouse gas to 1990 levels by 2020. Key elements of the Scoping Plan include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;

- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, the Low Carbon Fuel Standard, recycling and waste-related measures, as well as Voluntary Early Actions and Reductions; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long term commitment to AB 32 implementation.⁴³

CARB has until January 1, 2011, to adopt the necessary regulations to implement that plan. Implementation of individual measures must begin no later than January 1, 2012, so that the emissions reduction target can be fully achieved by 2020. CARB is currently drafting regulations to implement the plan. The elements of the Scoping Plan that are applicable to the proposed project are briefly summarized in Table 14.

Emissions Performance Standard for Electrical Generation (SB 1368)

The second important piece of climate change legislation from 2006 is Senate Bill 1368, which requires the Public Utilities Commission and the Energy Commission to implement an emissions performance standard for all retail providers of electricity in the state. For any long-term commitment (five years or longer) to buy or build generation to serve California retail customers, emissions must be limited to 1,100 pounds of carbon dioxide (CO₂) per megawatt-hour of electricity delivered. This is roughly equivalent to the emissions from a new combined cycle natural gas turbine. The law also provides for the possibility that the CO₂ emissions from a generator could be permanently captured and stored, thus not counting towards the performance standard limit for that generator.⁴⁴

Low Carbon Fuel Standard (Executive Order S-01-07)

This EO, which was signed by the governor in January 2007, mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020.⁴⁵

Western Regional Climate Action Initiative

This regional initiative, launched in early 2007, has been signed by seven western states (California, Oregon, Washington, Arizona, New Mexico, Utah and Montana) and British Columbia. Other U.S. and Mexican states and Canadian provinces have joined as observers. The Initiative plans on collaborating to identify, evaluate, and implement ways to reduce GHG emissions in the states collectively and to achieve related co-benefits. The Initiative plans to design a regional market-based multi-sector mechanism, such as a load-based cap and trade program in 2008.⁴⁶

Greenhouse Gas Cap-and-Trade Program

The State of California is exploring the possibility of cap-and-trade systems for greenhouse gases. This market-based approach is intended to complement the regulatory and incentive-based programs which are also mandated by AB 32. Specific recommendations regarding a cap-and-trade system were released in June 2007 by the Market Advisory Committee to the California Air Resources Board, which was formed specifically for this purpose. In general terms, a cap-and-trade system would place an emissions cap on major sources of GHG emissions, such as electrical generating plants. To the extent that individual facilities could cost-effectively reduce emissions below the cap, they could sell such additional reductions (or allowances) to other facilities which would then be allowed to exceed their cap by that amount. The

operators of other facilities, for which reaching the cap would not be cost effective, would have the option of buying credits to make up the difference. The goal is to achieve the overall target for state emissions reduction while allowing for flexibility in the system for facilities which cannot cost-effectively achieve their caps through on-site emissions reductions.⁴⁷ (As discussed under “Federal” above, the U.S. Congress is also taking up cap-and-trade legislation.)

Senate Bill 97

AB 32 did not amend CEQA or establish regulatory standards to be applied to new development or environmental review of projects within the State. Accordingly, the Legislature adopted Senate Bill 97 (SB 97) in August 2007. SB 97 requires the Governor’s Office of Planning and Research (OPR) to prepare, develop, and transmit new CEQA guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions to the Resources Agency by July 1, 2009 (this occurred in April 2009).⁴⁸ These guidelines for mitigation must address, but are not limited to, GHG emissions and effects associated with transportation and energy consumption. It directs the Resources Agency to certify or adopt those guidelines by January 1, 2010. Perhaps the most significant aspect of SB 97 is that it represents the first acknowledgement, in state legislation, that the issue of climate change requires analysis under CEQA.⁴⁹ Recent activities related to the implementation of SB 97 are described subsequently in this section, along with details of the proposed CEQA Guidelines amendments.

Senate Bill 375

Signed into law in September 2008, SB 375 enhances CARB’s ability to reach AB 32 goals by directing CARB to develop regional greenhouse gas emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. CARB will also work with California’s 18 metropolitan planning organizations to align their regional transportation, housing and land-use plans and prepare a “sustainable communities strategy” to reduce the amount of vehicle miles traveled in their respective regions and demonstrate the region’s ability to attain its greenhouse gas reduction targets. SB 375 also provides incentives for creating attractive, walkable and sustainable communities and revitalizing existing communities.

EO on Sea Level Rise (Executive Order S-13-08)

In November 2008, the Governor issued Executive Order (EO) S-13-08 directing state agencies to plan for sea level rise and climate change impacts. There are four key actions in the EO including: (1) initiate California’s first statewide climate change adaptation strategy that will assess the state’s expected climate change impacts, identify where California is most vulnerable and recommend climate adaptation policies by early 2009; (2) request the National Academy of Science establish an expert panel to report on sea level rise impacts in California to inform state planning and development efforts; (3) issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects; and (4) initiate a report on critical existing and planned infrastructure projects vulnerable to sea level rise.

California Climate Adaptation Strategy

Pursuant to EO S-3-05, in August 2009 the Natural Resources Agency released the public review draft of the *2009 California Climate Adaptation Strategy*.⁵⁰ The draft document summarizes the latest science on how climate change could impact the state, and provides recommendations on how to manage against those threats. The document outlines a multi-sector strategy to help guide efforts in adapting to climate

change impacts, and in particular how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings.

Energy Action Plan

Described in detail in Section N. *Energy*, the guiding principals of the California Energy Action Plan are energy efficiency and demand response as the State's preferred means of meeting growing energy needs. Implementation of the Plan will have the incidental effect of reducing carbon dioxide emissions through reductions in fossil fuel consumption.

Title 24 (California Energy Code)

As discussed in Section N. *Energy*, the California Energy Code mandates energy conservation standards for all new and renovated commercial and residential buildings constructed in California. The energy savings realized through Title 24 have the indirect effect of reducing carbon dioxide emissions related to space heating and cooling.

Green Building Initiative

As discussed in Section M. *Energy*, Executive Order S-20-04 (Green Building Initiative) mandates energy and resource-efficiency in building construction. The EO sets a goal of reducing energy use in State-owned buildings by 20 percent by 2015, and directs the CEC to refine Title 24 energy efficiency standards for building to meet the same goal. This will result in further reductions in carbon dioxide emissions related to building construction and operation.

California Green Building Code

On July 17, 2008, the California Building Standards Commission adopted a green building code for all new construction statewide. The Code took effect in January 2009 and will be voluntary until 2011, when its provisions are expected to become mandatory. The voluntary period is intended to give builders, local governments and communities time to adapt to the new rules. The code sets targets for energy efficiency, water consumption, dual plumbing systems for potable and recyclable water, diversion of construction waste from landfills and use of environmentally sensitive materials in construction and design, including eco-friendly flooring, carpeting, paint, coatings, thermal insulation and acoustical wall and ceiling panels.

Regional

Joint Policy Committee

In the Bay Area, the Joint Policy Committee (JPC) coordinates the regional planning efforts of the Association of Bay Area Governments (ABAG), the Bay Area Air Quality Management District (BAAQMD), the Bay Conservation and Development Commission (BCDC) and the Metropolitan Transportation Commission (MTC). In fall 2006, the JPC commenced a six-month program to study the issue of climate change and to recommend an initial set of actions to be pursued jointly by the four regional agencies. The study recommends that the regional agencies build their Joint Climate Protection Strategy.⁵¹

Bay Area Air Quality Management District (BAAQMD)

The Air District's primary approach to climate change has been to integrate climate protection activities into existing District programs. The District has not been directly involved in regulation of carbon dioxide or other greenhouse gases, although it has implemented a greenhouse gas fee program which adds a small surcharge to annual permit fees for stationary sources (described further below). The District has also prepared GHG inventories for the nine-county Bay Area for the base years 2002 and 2007. For 2007, the total greenhouse gas emissions in the Bay Area were estimated to be 102.6 million metric tons of carbon dioxide equivalents, of which Contra Costa County's share was 32.0 million metric tons.⁵²

As part of its responsibility to provide local agencies with assistance in complying with CEQA, the Air District is currently in the process of developing interim significance thresholds for greenhouse gas emissions to be used until permanent thresholds are developed at the State level under AB 32. In October 2009, the Air District released its *Revised Working Draft Options and Justification Report on CEQA Thresholds of Significance*, which includes detailed analysis of significance thresholds options. The climate change-related threshold options are discussed subsequently in this section.

In May 2008, the Bay Area Air Quality Management District implemented a greenhouse gas fee program under which industrial facilities and businesses that currently are required to obtain an air quality permit to operate would be assessed an additional 4.4 cents per metric ton of GHG emissions to their annual permit fees.⁵³ The fees will be used to recover costs of climate protection activities such as emissions inventory development, environmental review, and air regulations.

Contra Costa County

Contra Costa County has taken several steps toward reducing greenhouse gas emissions. The County has joined over 30 counties in adopting the long-term GHG reduction target set by the U.S. Cool Counties Climate Stabilization Declaration. This declaration calls on the County to work with local, state, and federal governments and their local leaders to develop a regional plan to reduce countywide GHG emissions below baseline levels by 2050. In December 2008, the County adopted a *Municipal Climate Action Plan* which plans for reduction of GHG emissions related to County government operations. The Plan identifies measures to be applied to County government operations (i.e., employee trip reduction; alternative fuel vehicles for County fleet; reduced waste and increased energy efficiency in County buildings) and identifies emissions reductions targets and implementation measures for achieving the plan's goals.⁵⁴

City of Antioch General Plan

The General Plan does not contain objectives or policies that specifically address climate change. However, the following objective and policies pertaining to energy are relevant:

10.0 Resource Management

10.8.1 Energy Resources Objective

Reduce reliance on nonrenewable energy sources in existing and new commercial, industrial, and public structures

10.8.2 Energy Resource Policies

- a. Continue to implement Title 24 of the State Building Code, and provide incentives to encourage architects and builders to exceed the energy efficiency standards of Title 24 through increased use of passive solar design and day-lighting.
- b. Promote the use of site design, landscaping, and solar orientation to decrease the need for summer cooling and winter heating.
- c. Where feasible, incorporate recycled materials in new construction.
- d. Encourage the installation of energy-efficient lighting, reduced thermostat settings, and elimination of unnecessary lighting in public facilities.
- i. The City shall review all development plans prior to approval to guarantee that energy conservation and efficiency standards of Title 24 are met and are incorporated into the design of the future proposed project.

In addition, policies directed toward efficient land use patterns and transportation networks would have the incidental effect of conserving energy. Other policies would result in more direct energy savings, such as those promoting transit and non-vehicular transportation, and implementation of Transportation Systems Management (TSM) measures. In addition, General Plan policies which address air quality would also have an indirect effect upon energy consumption. (For specific policies, see the ‘Regulatory Setting’ discussions in Sections *II. B. Air Quality* and *II. K. Traffic and Circulation*.)

City of Antioch Municipal Code

The Antioch Municipal Code includes provisions which are directed to conservation of resources, such as water and solid waste, which have the indirect effect of reducing energy consumption and emission of greenhouse gases.

Title 6, Article I of the Municipal Code requires all commercial operations to segregate recyclables and greenwaste for collection and disposal. In addition, Article II requires that all projects valued at greater than \$75,000 shall provide for the recycling of at least 50 percent of the waste construction and demolition materials.

Article 10 of Title 9 (Planning and Zoning) sets forth requirements for project landscaping and irrigation. Section 9-5.1002 requires installation of automatic irrigation systems and encourages drip irrigation. Section 9-5.1003 requires that plant materials be selected for drought tolerance, adaptability to the local environment, and reduced energy demand. It further requires that plant materials and landscape design be consistent with the City’s water conservation guidelines.

Building Code

The Antioch Building Code is based on the California Building Code of 2007, which includes the Title 24 requirements. Therefore, the Building Code implements the State-mandated energy-efficiency standards for new construction (described above), which have the indirect effect of reducing greenhouse gas emissions associated with energy consumption.

Private Sector Energy-Efficiency Incentive Programs

In addition to government policies and programs, the private sector providers of electric power and natural gas to the project offer a number of incentives to encourage reduced energy consumption. These incentives are described in detail in Section *II. M. Energy*.

CEQA AND GLOBAL CLIMATE CHANGE

There are several unique challenges to analyzing global warming under CEQA, largely because of its “global” nature. Typical CEQA analyses address local actions that have local – or, at most, regional – impacts, whereas global warming presents the considerable challenge of analyzing the relationship between local and global activities and the resulting potential, if any, for local and/or global environmental impacts. Most environmental analyses examine the “project-specific” impacts that a particular project is likely to generate. With regard to global warming, however, it is generally accepted that the magnitude of global warming effects is so substantial and the contribution of an individual project to global warming is so small that direct significant adverse impacts (albeit not necessarily cumulative significant adverse impacts) would be highly unlikely.

The issue of global climate change is also fundamentally different from other areas of air quality impact analysis, which are all linked to some region or area in which the impact is significant. Instead, a global climate change analysis must be conducted on a global level, rather than the typical local or regional setting, and requires consideration of not only emissions from the project under consideration, but also the extent of the displacement, translocation, and redistribution of emissions. In the usual context, where air quality is linked to a particular location or area, it is appropriate to consider the creation of new emissions in that specific area to be an environmental impact whether or not the emissions are truly “new” emissions to the overall globe. In fact, the approval of a new developmental plan or project does not necessarily create new automobile drivers - the primary source of a land use project’s emissions. Rather, new land use projects primarily redistribute existing mobile emissions¹; accordingly, the use of models that measure overall emissions increases without accounting for existing emissions will substantially overstate the impact of the development project on global warming. This makes an accurate analysis of GHG emissions substantially different from other air quality impacts, where the “addition” of redistributed emissions to a new locale can make a substantial difference to overall air quality.

As is evident from the preceding discussion, global climate change resulting from greenhouse gas emissions is a rapidly emerging environmental concern at all levels. Although efforts are underway to set in place regulations and guidance with respect to the treatment of global climate change in CEQA documents, to date there have been no adopted amendments to CEQA or the Guidelines which would provide regulatory framework for addressing this concern in environmental documents. Currently, there are no adopted standards or thresholds of significance for measuring the impact of a project on global climate change, or the effect of climate change on a project, either individually or cumulatively. The regulatory and technological

¹ For example, a subdivision of 500 homes generates 3,000 new trips per day and those trips would be added to the local streets and intersections. In the case of global warming, the trips that are associated with those same 500 homes presumably emit roughly the same volume of GHGs in Antioch as they would if they were traveling the same miles in Bakersfield or Des Moines, Iowa. As a result, a methodology which assumes that raw vehicle trip counts occurring within a project area will accurately predict change in global climate conditions as reliably as they will predict congestion at intersections is seriously flawed. While those trips certainly could increase the number of vehicles which will pass through local intersections, they will not increase the amount of GHG emissions into the world’s atmosphere if those trips simply have been relocated from another location on the planet.

environment is still dynamic and the field of analysis has remained wide open and inconsistent. However, as discussed subsequently, substantial progress has been made at the state level and at the regional air quality management agencies to develop significance thresholds related to greenhouse gas emissions from land use development projects.

Senate Bill 97

As discussed previously, the only state legislation enacted to date which addresses CEQA's role in addressing global climate change is SB 97, which was signed into law in August 2007. SB 97 directs OPR to prepare, develop, and transmit to the Resources Agency new CEQA Guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions, by July 1, 2009. It directs the Resources Agency to certify or adopt those guidelines by January 1, 2010.

On April 13, 2009, the Governor's Office of Planning and Research submitted Proposed CEQA Guidelines Amendments to the Natural Resources Agency pursuant to SB97.⁵⁵ The proposed amendments include a new section to assist agencies in determining the significance of impacts of greenhouse gas emissions. Consistent with developing practice, this section urges lead agencies to quantify emissions of proposed projects where possible, and also recommends consideration of several other qualitative factors that may be used in the determination of significance. It states that a lead agency may appropriately look to thresholds developed by other agencies, such as CARB, so long as any threshold is supported by substantial evidence. The proposed amendments include general suggestions for mitigation, with emphasis on compliance with programmatic measures such as a planning document, and general guidelines are provided for the development of greenhouse gas reduction plans. The proposed amendments emphasize that since impacts resulting from greenhouse gas emissions are cumulative in nature, the focus should be on determining whether the project contributions are cumulatively considerable. Significant advantages may result from analyzing such impacts on a programmatic level, which would allow later projects to tier, incorporate by reference, or otherwise rely on that programmatic analysis.

In addition, Appendix F of the CEQA Guidelines was clarified to require EIRs to consider energy use and efficiency. Also, questions relating to the effects of greenhouse gas emissions were added to the Appendix G Environmental Checklist. In their draft form, these questions are as follows:

Would the project:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*
- b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?*

The proposed amendments are currently going through the Natural Resources Agency's rulemaking process for which the public comment period and hearings were held in the summer of 2009. Under SB 97, the rulemaking process is to be completed by January 1, 2010.

Guidance from Attorney General's Office

The Attorney General's efforts initially focused on calling for inclusion of climate change discussion in EIRs on large scale projects, such as oil refinery expansions, and on planning and policy documents such as General Plan updates or regional transportation plans. Most of these efforts have involved submittal of comments on EIRs prepared under CEQA, but in several instances the AG's office and others have filed lawsuits against local agencies to compel action. The case with the highest profile to date is the AG's lawsuit against San Bernardino County for its failure to consider global warming in its CEQA review of its

General Plan update. In August 2007, a settlement agreement was reached which requires the County to prepare a Greenhouse Gas Emissions Plan to include the following:

- An inventory of all known, or reasonably discoverable, sources of greenhouse gases in the County.
- An inventory of the greenhouse gas emissions level in 1990, currently, and that projected for the year 2020.
- A target for the reduction of emissions attributable to the county's discretionary land use decisions and its own internal government operations.

The Attorney General has indicated that he would encourage other counties to adopt similar plans to meet the greenhouse reduction mandates of AB 32.⁵⁶

In February 2008, the Attorney General's Office released a memorandum (updated in December 2008) containing recommendations on measures that could be used to reduce global warming impacts at the local level.⁵⁷ The recommendations are grouped into two broad categories, including "Generally Applicable Measures" which are intended for projects which result in significant global climate change impacts, and "General Plan Measures" which are intended to be applied as goals, policies, or programs in the preparation of General Plan elements. The types of measures that are applicable at the project level are organized under the following subject areas:

- Energy Efficiency
- Renewable Energy
- Water Conservation and Efficiency
- Solid Waste Measures
- Land Use Measures
- Transportation and Motor Vehicles

As discussed in detail under Impact N1 below, the proposed project includes a number of features and elements which reduce energy consumption, conserve resources, and reduce greenhouse gas emissions.

Association of Environmental Professionals (AEP) White Paper on Global Climate Change

In June 2007, the California AEP released its final White Paper on global climate change (entitled *Alternative Approaches to Analyzing Greenhouse Gas Emissions and Global Climate Change in CEQA Documents*), which represented the first comprehensive effort to provide professional guidance on how to address global climate change under CEQA.⁵⁸ The White Paper suggests various analytical approaches to enable practitioners to tailor their global climate change discussions according to the nature and magnitude of the project under consideration.

The most comprehensive approach outlined in the White Paper is "Approach 7 - Quantitative Analysis Relative to California GHG Emission Reduction Strategies." This approach employs both quantitative and qualitative components to provide a quantitative inventory of project greenhouse gas emissions, as well as appropriate and feasible mitigation measures to reduce impacts. However, as discussed in the White Paper, this approach is most suitable for regional projects such as General Plan Updates, where it is possible to develop past inventories for baseline years, which would enable a quantitative evaluation of whether implementation of the General Plan land use plan and policies would meet the state greenhouse gas

reduction targets, i.e., by 2020 reduce emissions to 1990 levels, etc. This is essentially the approach established in the San Bernardino County settlement agreement, discussed above. While there are several formulae and methodologies for calculating potential greenhouse gas emissions from individual development projects, the results may not be meaningful in the absence of adopted thresholds for greenhouse gas emissions.

In the absence of quantifiable significance thresholds for individual development projects, the White Paper suggests the application of the emission reduction strategies contained in the California Climate Action Team's (CAT) Report (2006) in order to qualitatively determine the global climate change impacts associated with a development project. Since these strategies are intended to help meet the emission reduction targets in EO S-3-05 (and AB 32), the reasoning is that if a project is in compliance with the applicable strategies, it would be doing its share to reduce greenhouse gas emissions and therefore would not have a significant impact on global climate change. The White Paper indicates that this would be preliminary approach until such time as final emission reduction strategies are formally adopted and can be evaluated for effectiveness, and/or an air quality management plan for greenhouse gas emissions is approved.

CAPCOA White Paper on CEQA and Climate Change

In January 2008, the California Air Pollution Control Officers Association (CAPCOA) released a white paper entitled *CEQA & Climate Change – Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*.⁵⁹ The document is explicitly intended as a resource for public agencies as they establish procedures for reviewing greenhouse gas emissions from projects under CEQA. It considers the application of thresholds and offers three alternative programmatic approaches toward determining whether greenhouse gas emissions are significant. The document presents and evaluates various analytical methodologies and approaches but makes no recommendations. The discussion of overall mitigation strategies notes that many of the example mitigation measures can be implemented through a comprehensive approach to land use planning and development, such as projects and plans that embody New Urbanism principles, particularly as a means of providing alternatives to individual vehicle use and reducing miles traveled. The document also discusses mitigation measures and includes an appendix which lists numerous mitigation measures currently in use or in development. The types of measures that are applicable at the project level are organized under the following subject areas:

- Transportation
- Design
- Energy Efficiency/Building Component
- Social Awareness/Education
- Construction

OPR Technical Advisory and Draft CEQA Guidelines

In January 2009, the Governor's Office of Planning and Research (OPR) issued a draft Technical Advisory entitled *CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*.⁶⁰ On April 13, 2009, OPR submitted proposed CEQA Guidelines Amendments to the Natural Resources Agency pursuant to SB 97.⁶¹ Of note, the final proposed guidelines state that a lead agency shall have discretion to determine whether to use a quantitative model or methodology, or in the alternative, rely on a qualitative analysis or performance based standards. Proposed CEQA Guideline §15064.4(a) ("A lead agency shall have discretion to determine, in the context of a particular project, whether to: (1) Use a model or methodology to quantify greenhouse gas emissions

resulting from a project, and which methodology to use . . . ; or (2) Rely on a qualitative analysis or performance based standards.”).

In its draft CEQA Guideline amendments, OPR does not identify a threshold of significance for greenhouse gas emissions, nor does it prescribe assessment methodologies or specific mitigation measures. Instead, it calls for a “good-faith effort, based on available information, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project.” The draft amendments encourage lead agencies to consider many factors in performing a CEQA analysis and preserve lead agencies’ discretion to make their own determinations based upon substantial evidence. The draft amendments also encourage public agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses.

The Natural Resources Agency has begun the formal rulemaking process, and conducted a public comment period on the proposed Guidelines amendments in July and August, 2009, as part of the process to certify and adopt the amendments as part of the state regulations implementing CEQA. Consistent with SB 97, the Natural Resources Agency should complete this process by January 2010. Until these Guidelines are approved, OPR’s Technical Advisory provides interim advice to lead agencies regarding the analysis of greenhouse gas emissions in environmental documents. The Technical Advisory encourages lead agencies to follow three basic steps: (1) identify and quantify the greenhouse gas emissions that could result from the proposed project; (2) analyze the effects of those emissions and determine whether the effect is significant, and (3) if the impact is significant, identify feasible mitigation measures or alternatives that will reduce the impact below a level of significance.

CARB’s Preliminary Staff Proposal for Interim Significance Thresholds

Although OPR was tasked with updating the CEQA guidelines for GHGs, OPR asked CARB in its Technical Advisory to recommend GHG-related significance thresholds to assist lead agencies in their significance determination. In October 2008, the CARB staff released *Preliminary Draft Staff Proposal – Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act*.⁶² In its proposal, Staff noted that non-zero thresholds (i.e., “zero-thresholds” refers to no increase in emissions over 1990 levels) can be supported by substantial evidence, but thresholds should nonetheless be sufficiently stringent to meet the State’s interim (2020) and long-term (2050) emissions reduction targets. The proposal takes different approaches for different sectors – (1) industrial projects and (2) residential and commercial projects. Although CARB Staff proposed a numerical threshold for the GHG emissions of industrial projects (i.e., 10,000 metric tons of CO₂e per year), none were proposed for commercial (and residential) projects. For residential and commercial projects, CARB Staff recommends that if a project complies with a previously approved plan that addresses GHG emissions, would not have a cumulatively considerable incremental contribution to impacts identified in the previously approved plan, and has a number of specific attributes related to meeting and monitoring GHG targets, then it will not be considered to have significant GHG emissions. Alternatively, if those standards cannot be met, Staff recommends a threshold based on implementation of performance standards, or equivalent mitigation measures, addressing energy use, transportation, water use, waste and construction. Specific performance standards are not presented for water, waste, construction, or transportation; however, CARB Staff recommends the California Energy Commission’s Tier II Energy Efficiency standards (specified as 35% above Title 24 requirements) for the energy performance standard, and references existing GHG-reducing programs, such as LEED, GreenPoint Rated and the California Green Building Code, as possible reference sources for the other performance standards. A key preliminary conclusion from the draft thresholds is that CARB Staff, in setting a numerical threshold for industrial projects and suggesting performance standards, does not believe a “zero threshold” is mandated by CEQA. Similarly, South Coast Air Quality Management District Staff, in

proposing interim industrial thresholds, explicitly stated in a December 5, 2008 report that a zero threshold would not be feasible to implement.

Development of GHG Significance Thresholds by Air Quality Management Districts

As part of their responsibilities to provide local agencies with assistance in complying with CEQA, the air districts in California are currently engaged in addressing various aspects of the climate change issue. Their efforts include the development of significance thresholds, performance standards, and mitigation measures, at least as interim guidance to be used until CARB adopts statewide thresholds pursuant to AB 32. Several of the major air districts, including the Bay Area Air Quality Management District (BAAQMD) and the San Joaquin Air Pollution Control District (SJVAPCD), are nearing the completion of guidance documents and are currently in the public review stage leading up to formal adoption. At least one air district – the South Coast Air Quality Management District (SCAQMD) – has adopted a guidance document (in December 2008). No air district in California has adopted a threshold of significance for greenhouse gas emissions for non-industrial land use projects. SCAQMD has adopted a screening significance threshold for industrial projects of 10,000 metric tons of CO₂e per year that also incorporates a tiered decision tree approach to apply performance standards.

BAAQMD's Draft Options Report on Thresholds of Significance

The BAAQMD is currently in process of developing interim significance thresholds to be used until permanent thresholds are developed at the State level under AB 32. A description of the BAAQMD analysis is contained in its *Revised Working Draft Options and Justification Report on CEQA Thresholds of Significance*.⁶³ Based on data produced for the CARB Scoping Plan (i.e., a 28 percent reduction in emissions across all sectors by 2020 is mandated under AB 32), the BAAQMD analysis determined that in order to achieve AB 32 reduction goals in the emissions sectors that are related to land use development (e.g., on-road passenger and heavy-duty motor vehicles, commercial and residential area sources [i.e., natural gas], electricity generation/consumption, wastewater treatment, and water consumption), California would need to achieve an approximate 26 percent reduction in GHG emissions from these “land use-driven” sectors. The GHG emissions inventory forecasts for 2020 under Business as Usual (BAU) contained in CARB's Scoping Plan do not consider the emissions reducing effects of recent legislation such as SB 107 (Renewable Portfolio Standard), the California Green Building Code (GBC), AB 1493 (Greenhouse Gas Reduction Bill - Pavley), and a portion of the reduction anticipated from the Low Carbon Fuel Standard (LCFS). It was calculated by BAAQMD that when the reductions from these State regulations (i.e., Scoping Plan measures) are taken into consideration, a remaining reduction of 2.3 percent would be required from the land use sectors in the San Francisco Bay Area Air Basin to meet the 1990 GHG emissions goal under AB 32, or a total of 1.6 million metric tons of carbon dioxide equivalents (CO₂e) per year. The BAAQMD's Draft Options Report considers three main options for significance thresholds that would result in the achievement of this reduction. These include: a numeric-only (or bright line option), a performance standard only option, and a combination of performance standards and numeric threshold. The BAAQMD has not set a timetable for adoption of the interim thresholds of significance.⁶⁴

SIGNIFICANCE CRITERIA

Based on the preceding discussion, it is reasonable to conclude that worldwide emissions of greenhouse gases at current and projected levels are and will continue to result in cumulatively significant impacts on global climate. However, no single project can individually create an impact upon a problem that is global in scope (i.e., no project will, by itself, raise the average temperature of the planet). Thus it is a given that

the geographic scope of the cumulative impact encompasses the entire earth, and that the level of the impact is cumulatively significant. Given also that the project-specific impact is less-than-significant, the remaining determination to be made is whether the greenhouse gas emissions from the proposed project would be cumulatively considerable. Section 15355(b) of the CEQA Guidelines states: “Cumulatively considerable means that the incremental effects of an individual 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...”

As discussed above, OPR’s Proposed CEQA Guidelines Amendments include new questions relating to the effects of greenhouse gas emissions which are proposed to be added to the Appendix G Environmental Checklist. In their draft form, these questions are as follows:

Would the project:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

For purposes of this analysis, these proposed new checklist items are restated in the following significance threshold:

The greenhouse gas emissions associated with the project would be considered to be cumulatively considerable if:

The generation of GHG emissions from the project, when considered in connection with the GHG emissions of other prior, current, and reasonably foreseeable projects within the State of California, would impede the state goal of reducing greenhouse gas emissions in California to 1990 levels by 2020, as set forth by the timetable established in Executive Order S-3-05 and AB 32 – California Global Warming Solutions Act of 2006.

IMPACTS AND MITIGATION

Cumulative Impacts

Impact N1. Potential for Project to Impede Implementation of AB 32. The greenhouse gas emissions resulting from the proposed project would not be sufficient to significantly hinder or delay the State’s ability to implement the greenhouse gas reduction targets prescribed by AB 32. (Less-than-Considerable Contribution to Cumulative Impact)

As discussed under ‘Significance Criteria’ above, it is a given that the impacts of human activities upon the global climate are cumulatively significant, although no single project, including the proposed project could result in a significant project-specific impact to global climate. Therefore, the purpose of this analysis is to determine whether the proposed project would make a cumulatively considerable contribution to global climate change.

As discussed under “CEQA and Climate Change” above, no guidelines have been established by the State agencies for determining the level of greenhouse gas emissions from projects that would be considered to constitute a significant impact under CEQA or AB 32. Therefore, the following broad categories of factors are considered in arriving at a determination of significance for this project:

- Estimation of greenhouse gas emissions resulting from project construction and operation;
- Proposed project features that have the potential to reduce estimated greenhouse gas emissions associated with the project;
- Potential for the project to conflict with the greenhouse gas emission reduction strategies recommended in the *California Air Resources Board (CARB) Climate Action Scoping Plan*, December 2008.

Greenhouse Gases Generated by the Project

The primary greenhouse gases that would be generated by the project are carbon dioxide, methane, and nitrous oxide. The project emissions for the other three recognized greenhouse gases would be zero or negligible, as discussed below.

Carbon Dioxide: The project will generate emissions of carbon dioxide in the form of vehicle and equipment exhaust during construction, from vehicle exhaust generated during project operation, from consumption of natural gas for space and water heating, and indirectly from fossil fuels consumed in the generation of electricity used at the project.

Methane: The project will generate some methane gas from vehicle emissions, natural gas consumption, and fossil fuels consumed in electrical generation.

Nitrous Oxide: The project will generate small amounts of nitrous oxide from vehicle emissions, natural gas consumption, and electrical generation.

Hydrofluorocarbons: The project may emit a small amount of HFCs from leakage and service of refrigeration and air conditioning equipment and from disposal of equipment. Walmart is known to be using non-HFC refrigerants, although the project emissions of HFCs would be expected to be negligible in any event.

Perfluorocarbons: This gas is typically used in industrial applications which would not be expected to occur at the site. Therefore, the project is not anticipated to generate any PFCs.

Sulfur Hexafluoride: The greenhouse gas is also used in processes which would not occur on the project site. Therefore, the project is not anticipated to generate any of this gas.

The estimates of project greenhouse gas emissions provided in the tables the following pages are based on:

- Construction emissions are based on URBEMIS computer model output (provided by Illingworth & Rodkin), combined with recommended factors contained in the *California Climate Action Registry General Reporting Protocol (Version 3.1/January 2009)*.⁶⁵ The total emissions of methane and nitrous oxide were converted to Carbon Dioxide Equivalents based on their Global Warming Potential relative to carbon dioxide.
- Mobile and stationary source CO₂ emissions are based on URBEMIS2007 computer model output for the proposed project (provided by Illingworth & Rodkin).

- All other emissions estimates are based on recommended factors contained in the *California Climate Action Registry General Reporting Protocol (Version 3.1/January 2009)*. The total emissions of methane and nitrous oxide were converted to Carbon Dioxide Equivalents based on their Global Warming Potential relative to carbon dioxide.

TABLE 14
PROJECT GREENHOUSE GAS EMISSIONS
FROM PROJECT CONSTRUCTION (METRIC TONS)

	Carbon Dioxide (CO₂)	Methane (CH₄)	Nitrous Oxide (N₂O)	Total Construction Emissions
Gallons of fuel	NA ¹	905 gal ²	905 gal ²	
Conversion Factor	NA ¹	0.58 g/gal	0.26 g/gal	
Total Emissions (metric tons)	76.069 mt	0.0005 mt	0.0002 mt	
Global Warming Potential (GWP)	1	23	296	
Carbon Dioxide Equivalent (CO ₂ e)	76.069 mt CO ₂	0.0003 mt CO ₂ e	0.0001 mt CO ₂ e	

¹ Construction CO₂ emissions are based on the URBEMIS2007 model output for the project.

² Derived from URBEMIS2007 model output for project based on conversion factor of 10.15 kg CO₂/gal (diesel) from California Climate Action Registry Protocol.

Source for conversion factors: *California Climate Action Registry General Reporting Protocol (Version 3.1/January 2009)*

TABLE 15
PROJECT GREENHOUSE GAS EMISSIONS
FROM MOBILE COMBUSTION (METRIC TONS PER YEAR)

	Carbon Dioxide (CO₂)	Methane (CH₄)	Nitrous Oxide (N₂O)	Total Mobile Emissions
Vehicle Miles	NA ¹	11,754 mi	11,754 mi	
Conversion Factor	NA ¹	0.00346 g/mi ²	0.0621 g/mi ²	
Total Emissions (metric tons)	1,791.566 mt	0.041 mt	0.730 mt	
Global Warming Potential (GWP)	1	23	296	
Carbon Dioxide Equivalent (CO ₂ e)	1,791.566 mt CO ₂	0.943 mt CO ₂ e	216.080 mt CO ₂ e	

¹ As noted in the text, the mobile CO₂ emissions are based on the URBEMIS2007 model output for the project instead of conversion factors provided by the California Climate Action Registry.

² Emission factor for light duty trucks for year 2000 selected to represent worst-case average for passenger cars and light-duty trucks.

Source for conversion factors: *California Climate Action Registry General Reporting Protocol (Version 3.1/January 2009)*

As shown in Table 14, the construction of the project would result in total emissions of approximately 76.1 metric tons of greenhouse gases.

TABLE 16
PROJECT GREENHOUSE GAS EMISSIONS
FROM STATIONARY COMBUSTION (METRIC TONS CO₂e PER YEAR)

	Carbon Dioxide (CO₂)	Methane (CH₄)	Nitrous Oxide (N₂O)	Total Mobile Emissions
Natural Gas Consumption	NA ¹	1.038 MM Btu	1.038 MM Btu	
Conversion Factor	NA ¹	0.005 kg CH ₄ /MM Btu	0.0001 kg N ₂ O/MM Btu	
Total Emissions (metric tons)	76.785 mt	0.0000051 mt	0.0000001 mt	
Global Warming Potential (GWP)	1	23	296	
Carbon Dioxide Equivalent (CO ₂ e)	76.993 mt CO ₂	0.00012 mt CO ₂ e	0.00003 mt CO ₂ e	76.993 mt CO ₂ e

¹ As noted in the text, the stationary CO₂ emissions are based on the URBEMIS2007 model output for the project instead of conversion factors provided by the California Climate Action Registry.

Source for conversion factors: *California Climate Action Registry General Reporting Protocol (Version 3.1/January 2009)*

TABLE 17
PROJECT INDIRECT GREENHOUSE GAS EMISSIONS
FROM ELECTRICAL USE (METRIC TONS CO₂e PER YEAR)

	Carbon Dioxide (CO₂)	Methane (CH₄)	Nitrous Oxide (N₂O)	Total Mobile Emissions
Electrical Consumption	470.05 MegawattHrs (MWh)	470.05 MWh	470.05 MWh	
Conversion Factor	724.12 lbs CO ₂ /MWh	0.0302 lbs CH ₄ /MWh	0.0081 lbs CH ₄ /MWh	
Total Emissions (metric tons)	154.390 mt	0.0064 mt	0.0017 mt	
Global Warming Potential (GWP)	1	23	296	
Carbon Dioxide Equivalent (CO ₂ e)	154.390 mt CO ₂	0.147 mt CO ₂ e	0.503 mt CO ₂ e	155.040 mt CO ₂ e

Source for conversion factors: *California Climate Action Registry General Reporting Protocol (Version 3.1/January 2009)*

TABLE 18
SUMMARY OF GREENHOUSE GAS EMISSIONS FROM PROJECT OPERATIONS
(METRIC TONS CO₂e PER YEAR)

	Carbon Dioxide (CO ₂)	Methane (CH ₄)	Nitrous Oxide (N ₂ O)	Total GHG Emissions	Percent of Total
Mobile Combustion	1,791.566 mt	0.943 mt	216.080 mt	2,008.589 mt	89.64%
Stationary Combustion	76.993 mt	0.00012 mt	0.00003 mt	76.993 mt	3.44%
Electrical Use	154.390 mt	0.147 mt	0.503 mt	155.040 mt	6.91%
Total Emissions	2,022.949 mt CO ₂	1.090 mt CO ₂ e	216.583 mt CO ₂ e	2,240.622 mt CO ₂ e	

Source for conversion factors: *California Climate Action Registry General Reporting Protocol (Version 3.1/January 2009)*

As shown in Tables 15 through 18, it is estimated that the project operations would directly or indirectly generate approximately 2,240.622 metric tons of CO₂ equivalents annually upon buildout under Business As Usual conditions. In order to factor construction-related emissions into the total, the estimated construction emissions total of 76.069 metric tons (see Table 14) was annualized over the life of the project (assumed to be 30 years) to yield 2.536 tons per year in construction emissions. Thus the total greenhouse gas emissions from the project are estimated to be 2,243.158 metric tons per year under Business As Usual conditions. Compared to Contra Costa County's total GHG emissions of 32 million metric tons in 2007,⁶⁶ the project contribution would be 0.006 percent (6/100,000th) of the County total. Compared to California's 2004 GHG emissions total of 484 gross million metric tons,⁶⁷ the project contribution would be 0.0005 percent (5/1,000,000th) to the State total. By comparison the U.S. total for 2004 was 7.25 billion metric tons,⁶⁸ and the global total for 2004 was 49.0 billion metric tons.⁶⁹ While the greenhouse gas emissions associated with the project would make an incremental contribution to global climate change, the magnitude of the contribution would be extremely small in the county, state, national or global contexts.

Proposed Project Features Which Reduce Project GHG Emissions

The project would incorporate sustainability features into the store's design that would result in the store's meeting or exceeding California Title 24 energy-efficiency requirements. These features will include the features listed below, or equivalent technology that achieves the same or better GHG emissions reductions.

Energy Efficiency

The entire project will meet the energy efficiency standards of Title 24, at a minimum, and will include the following features or their functional equivalents:

Expansion Area Only

- *Daylighting*: The expansion area will include a day lighting system in the grocery area. As daylight increases, skylights will allow the store to dim the lights in the

expansion area or even turn them off, reducing the demand for electricity during peak hours.

- *Night Dimming:* The project will include night dimming, via which interior illumination of the grocery area will be dimmed by 65 percent during late night hours.
- *Energy efficient HVAC units:* The project will utilize one of the industry's most efficient heating, ventilating and air-conditioning (HVAC) units available for the expansion area. Per ASHRAE 90.1-2004, retail stores' HVAC equipment is required to achieve an overall minimum Energy Efficiency Ratio (EER) value of 10.3. The HVAC equipment that will be installed in the expansion area has an overall EER value of 12.7, well above the standard.

Entire Expanded Store

- *Water Heating:* The project will reclaim waste heat from on-site refrigeration equipment to supply 70 percent of the hot water needs for the store.
- *Central Energy Management:* Walmart employs a centralized energy management system (EMS) to monitor and control the heating, air conditioning, refrigeration and lighting systems for all stores from Walmart's corporate headquarters in Bentonville, Arkansas. The EMS enables Walmart to constantly monitor and control energy usage, analyze refrigeration temperatures, observe HVAC and lighting performance, and adjust system levels from a central location 24 hours per day, seven days per week.
- *White Roof:* The entire store will have a "white" membrane roof instead of the typical darker colored roof materials. The high solar reflectivity of this membrane results in lowering the "cooling" load by about 10 percent. No PVC-roofs will be used.
- *Interior Lighting Retrofit Program:* All lighting in the store will be replaced by T-8 fluorescent lamps and electronic ballasts, resulting in a 15-20 percent reduction in energy load.
- *LED Lighting:* All exterior building signage and many refrigerated food cases in the store will be illuminated with light emitting diodes (LEDs). LED technology can provide a 70 percent more energy-efficient operation than fluorescent illumination.

Resource Conservation

In addition to the above energy-efficiency features, the project will also incorporate the following programs and practices to facilitate resource conservation:

- *Recycled Building Materials:* The construction of the expansion area will use nearly 100 percent recycled structural steel, which will utilize 50 percent less energy in mining and manufacturing than new steel. All of the plastic baseboards and much of the plastic shelving in the expansion area will be composed of recycled plastic.
- *Waste Recycling:* The existing store recycles all of its cardboard and plastic waste, used tires and batteries, waste motor oil, bottles and cans, cooking oil, single-use cameras, silver from photo labs, and electronic waste. Walmart also works with suppliers to reduce packaging. These practices will continue with the expanded store.

- *Recycle Construction and Demolition Waste.* At a minimum, project will comply with City of Antioch requirement for 50 percent or more recycling of waste construction and demolition materials.
- *Water Conservation:* In addition to low-flow fixtures and toilets required by the California Plumbing Code, the entire expanded store will use only sensor-activated low-flow faucets. The front and rear restrooms will have these fixtures as listed below.
 - All restroom sinks in the entire expanded store will use sensor-activated ½ gallon per minute high-efficiency faucets. These faucets regulate water flow and reduce water usage by 78 percent compared to mandated 1992 EPA Standards.
 - The entire expanded store will include high-efficiency urinals that use only 1/8 of a gallon (one pint) of water per flush. This fixture yields 87 percent water savings per flush versus conventional one gallon per flush urinals, and requires less maintenance.
- *Low-Water Landscaping:* Under the City of Antioch Municipal Code, the project will be required to create water-efficient landscapes. This includes selection of drought-tolerant landscape species and the installation of water-efficient irrigation systems and devices.

Pollution/Greenhouse Gas Reduction

The project will include the following design features and practices which will reduce generation of pollutants, including greenhouse gases.

- *Ozone Friendly Refrigerants:* The existing store uses R-410a as HVAC refrigerant and R404a for refrigeration, both of which have no ozone depletion potential and relatively modest global warming potential compared with older chlorine-based refrigerants. These would continue to be used in the expanded store.
- *Fly Ash in Cement:* Walmart concrete specifications include a requirement for 15-20 percent fly ash content (from coal-fired power generation) in cement, or 25-30 percent slag content (a waste product of steel manufacturing). The use of these materials reduces greenhouse gas emissions from cement production.

Project Planning and Design Measures

- *Pedestrian Pathways:* The project incorporates sidewalks and pathways to provide pedestrian access through site and to connect with public transit stops.
- *Bicycle Storage:* The project provides bicycle storage in front of the store.

Potential for Project to Conflict with CARB Scoping Plan

The Climate Action Scoping Plan represents the culmination of measures adopted by the State to date to implement the greenhouse reduction targets of AB 32. It carries forward the strategies identified in the Greenhouse Gas Emissions Strategies recommended by the California Climate Action Team (CAT) in 2006, and incorporates the Early Action items adopted by CARB in 2007 under AB 32. The potential for the proposed project to conflict with the greenhouse gas reduction strategies and recommendations contained in the Scoping Plan is evaluated in Table 19 to determine the project's potential to impede the implementation of AB 32.

TABLE 19
ANALYSIS OF POTENTIAL PROJECT CONFLICTS WITH
GREENHOUSE GAS EMISSIONS REDUCTION STRATEGIES AND RECOMMENDATIONS
IN CARB'S CLIMATE CHANGE SCOPING PLAN²

GHG Reduction Strategies and Recommendations	Does Project Conflict with Strategy/Recommendation?
Transportation-Related Emissions	
<p><u>Light-Duty Vehicle Greenhouse Gas Standards:</u> AB 1493 (Pavley) requires the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions emitted by passenger vehicles and light duty trucks. New vehicles complying with this regulation will consume nearly 30 percent less fuel than vehicles built before the requirements were implemented.</p>	<p>No project conflict.</p> <p>The vehicles that access the project will be in compliance with any vehicle standards that CARB adopts.</p> <p>(Note: Walmart is modifying its heavy-duty truck fleet for maximum fuel efficiency, with an expected doubling of average fuel economy from 6.5 to 13 miles per gallon by 2015. Walmart is also converting its light-duty truck fleet to hybrid models, and is testing hybrid heavy-duty trucks for planned full-scale conversion.)</p>
<p><u>Medium/Heavy-Duty Vehicle Emission Reduction Measures:</u> Increased efficiency in the design of heavy-duty vehicles to reduce aerodynamic drag. Hybridization of vehicles for increased fuel efficiency.</p>	
<p>CARB Rule</p> <p><u>Diesel Anti-Idling:</u> In July 2004, the CARB adopted a measure to limit diesel-fueled commercial motor vehicle idling to no more than 5 minutes.</p>	<p>No project conflict.</p> <p>Diesel delivery trucks visiting the project site will be required to comply with the CARB-enforced idling limitation. Walmart's large delivery trucks currently include automatic ignition switches that turn off truck engines idling for 3 minutes. Diesel-powered construction equipment and trucks will also be subject to a 5 minute idling limitation pursuant to Air Quality Mitigation B1 identified in this EIR.</p>
<p><u>Transportation Refrigeration Units (TRU).</u> CARB regulation (13 CCR 2477) requires phased emissions reductions for TRUs beginning in July 2009.</p>	<p>No project conflict.</p> <p>Walmart will receive deliveries from trucks with TRUs. Walmart has converted its TRU fleet to include small efficient diesel-powered generators to run the TRUs so truck engines can be turned off during deliveries or other stationary periods.</p>

² The listed strategies and recommendations do not include those which do not apply to the project, e.g., those related to oil and gas extraction, refinement and transmission; high speed rail; agriculture; reforestation; methane emissions from landfills, etc.

TABLE 19 (CONT'D)

ANALYSIS OF POTENTIAL PROJECT CONFLICTS WITH
GREENHOUSE GAS EMISSIONS REDUCTION STRATEGIES AND RECOMMENDATIONS
IN CARB'S CLIMATE CHANGE SCOPING PLAN

GHG Reduction Strategies and Recommendations	Does Project Conflict with Strategy/Recommendation?
Transportation-Related Emissions	
<p><u>Low-Carbon Fuel Standard:</u> Under EO S-01-07, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020. It is expected that this target will be reached through extensive use of biofuels.</p>	<p>No project conflict.</p> <p>Vehicles accessing the site will use fuel blends available at the pump, as mandated by CARB.</p>
Industrial Emissions	
<p><u>Cement Manufacturing:</u> Cost-effective reductions to reduce energy consumption and to lower carbon dioxide emissions in the cement industry.</p>	<p>No project conflict.</p> <p>Walmart concrete specifications require minimum 15% fly ash content (or 25% granulated slag content) in cement. The use of these materials reduces greenhouse gas emissions from cement production.</p>
Solid Waste and Recycling	
<p><u>Zero Waste – High Recycling:</u> Additional recycling and reuse beyond the State's 50 percent recycling goal.</p>	<p>No project conflict.</p> <p>The City of Antioch diversion rate is currently 55 percent (2006), the project diversion should be well over 50 percent. Walmart recycles all of its cardboard and plastic waste, used tires and batteries, waste oil, bottles and cans, and single-use cameras. Walmart also works with suppliers to reduce packaging.</p> <p>Used shipping pallets will be picked up by Walmart trucks and reused, as is the current practice.</p> <p>Walmart uses almost 100 percent recycled structural steel in new building construction, as well as recycled plastic for baseboards and shelving.</p> <p>At a minimum, project will comply with City of Antioch requirement for 50 percent or more recycling of waste construction and demolition materials.</p> <p>One of the stated objectives of Walmart's sustainability program is zero waste.</p>

TABLE 19 (CONT'D)

**ANALYSIS OF POTENTIAL PROJECT CONFLICTS WITH
 GREENHOUSE GAS EMISSIONS REDUCTION STRATEGIES AND RECOMMENDATIONS
 IN CARB'S CLIMATE CHANGE SCOPING PLAN**

GHG Reduction Strategies and Recommendations	Does Project Conflict with Strategy/Recommendation?
Water Conservation and Efficiency	
<p><u>Water Use Efficiency</u>: Increasing the efficiency of water transport and reducing water use would reduce greenhouse gas emissions.</p>	<p>No project conflict.</p> <p>The project will employ low-flow toilets, high-efficiency urinals, and sensor-activated low-flow faucets that exceed the requirements of the California Plumbing Code.</p> <p>Landscape species would be selected for drought tolerance and suitability to local climate, per City ordinance. The project landscape irrigation system would be designed and operated to provide appropriate flow quantities directed to landscaped areas only. Per City ordinance, wasting of water is prohibited.</p>
Green Building Strategy – Energy Efficiency	
<p><u>Green Buildings Initiative</u>: Green Building Executive Order, S-20-04, sets a goal of reducing energy use in public and private buildings by 20 percent by the year 2015, as compared with 2003 levels. The Green Buildings Standards Code (GBSC), adopted in July 2008 is currently voluntary but a mandatory code applicable to all occupancies is expected to be adopted in 2011.</p>	<p>No project conflict.</p> <p>The project is expected to exceed Title 24 standards for building construction through a number of features as described below.</p> <p>The expansion area will include skylight/dimming systems which operate to automatically dim lights and ultimately turn them off as daylight increases.</p> <p>The expanded store will be equipped with a central energy management system which enables energy use to be optimized.</p> <p>The building will have white membrane roof with high solar reflectivity, thus lowering the ‘cooling’ load by about 10 percent.</p> <p>New HVAC (heating and cooling) units will be “super” high-efficiency packaged HVAC units which have energy efficiency ratios well above the standard.</p> <p>Waste heat from on-site refrigeration units will be reclaimed to meet 70 percent of the store’s hot water needs.</p>

TABLE 19 (CONT'D)

**ANALYSIS OF POTENTIAL PROJECT CONFLICTS WITH
 GREENHOUSE GAS EMISSIONS REDUCTION STRATEGIES AND RECOMMENDATIONS
 IN CARB'S CLIMATE CHANGE SCOPING PLAN**

GHG Reduction Strategies and Recommendations	Does Project Conflict with Strategy/Recommendation?
Green Building Strategy – Energy Efficiency	
<u>Green Buildings Initiative:</u> (Continued)	<p>All lighting in the store will be replaced by T-8 fluorescent lamps and electronic ballasts, resulting in a 15-20 percent reduction in energy load.</p> <p>All exterior building signage and many refrigerated food cases in the store will be illuminated with light emitting diodes (LEDs), which can be 70 percent more energy-efficient than fluorescent illumination.</p> <p>The outdoor project lighting will automatically turn on and off at dusk and dawn. Nighttime lighting of parking areas is required for security and public safety</p> <p>Along front building façade, which is oriented to south, near-continuous pedestrian shading will be provided by roof overhangs, porticos, trellises, and tree planting.</p>
High Global Warming Potential Gases	
<u>Hydrofluorocarbon Reduction:</u> 1) Limit high GWP use in consumer products and vehicle AC systems; 2) Ensure leak-tight AC systems and reduce AC servicing by non-professionals; 3) Adopt specifications for new commercial refrigeration.	<p>No project conflict.</p> <p>This measure applies to consumer products, commercial refrigeration, and motor vehicle air conditioners. When CARB adopts regulations for these reduction measures, the affected products and practices will be required to comply. Walmart has converted to R-410a as HVAC refrigerant and R404a for refrigeration, both of which have no ozone depletion potential and relatively modest global warming potential compared with older chlorine-based refrigerants.</p>
Land Use Measures	
<u>Urban Forestry:</u> A new statewide goal of planting 5 million trees in urban areas by 2020 would be achieved through the expansion of local urban forestry programs.	<p>No project conflict.</p> <p>Project includes planting of approximately 150 shade trees. These trees will store carbon and also will help reduce heat build-up on paved surface and reduce vehicle air conditioner use.</p>

TABLE 19 (CONT'D)

**ANALYSIS OF POTENTIAL PROJECT CONFLICTS WITH
GREENHOUSE GAS EMISSIONS REDUCTION STRATEGIES AND RECOMMENDATIONS
IN CARB'S CLIMATE CHANGE SCOPING PLAN**

GHG Reduction Strategies and Recommendations	Does Project Conflict with Strategy/Recommendation?
Land Use Measures	
<p><u>Smart Land Use and Intelligent Transportation Systems (ITS)</u>: Smart land use strategies encourage jobs/housing proximity, promote transit-oriented development, and encourage high-density residential/commercial development along transit corridors. ITS is the application of advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods and services.</p>	<p>No project conflict.</p> <p>The project locates retail in proximity to existing residential land uses, which will reduce vehicle trips and vehicle miles traveled.</p> <p>The project involves the infill development of a vacant 3.7-acre parcel within the urbanized area of Antioch.</p> <p>The project is located adjacent to a major transportation corridor, and near the SR-4 Bypass, thus minimizing vehicle use and congestion of surface streets to access this regional shopping destination.</p> <p>The project is located on a transit route which has the potential to further reduce trips.</p> <p>The project provides pedestrian-only paths to existing transit stops on Hillcrest Avenue and Lone Tree Way.</p> <p>The project provides bicycle racks at the storefront and access to the City's bikeway system along the Lone Tree Way frontage.</p>
Renewable Energy	
<p><u>Million Solar Roofs Program</u>: The California Solar Initiative (SB 1) provides incentives for installation of 1 million solar roofs by 2016 on homes and businesses, and increased use of solar thermal and cooling systems to offset energy demand.</p>	<p>Not feasible.</p> <p>There are no plans to install rooftop solar panels in conjunction with the store expansion. According to the applicant, rooftop solar panels are not proposed for the Walmart expansion for the following reasons: 1) The amount of rooftop area that can be devoted to solar panels is severely restricted based on the configuration of the roof, the setback requirements, and the placement of rooftop mechanical equipment; 2) To accommodate rooftop solar panels, the planned skylight areas would need to be reduced, thus substantially reducing the energy savings captured by the proposed daylighting system.</p>

The foregoing evaluation in Table 19 shows that the project would not conflict with the applicable GHG reduction strategies and recommendations contained in CARB's Scoping Plan. In addition, the project would include many of the greenhouse gas reduction measures identified by the Attorney General's Office and by the California Air Pollution Control Officers Association (CAPCOA). Thus it is reasonable to conclude that the project would not impede or interfere with the achievement of greenhouse gas reduction targets under AB 32. Therefore, it is concluded that the project would result in a *less-than-considerable contribution* to cumulative greenhouse gas emissions and global climate change.

Mitigation. No mitigation required.

GLOBAL CLIMATE CHANGE ENDNOTES

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