DRAFT & FINAL
ENVIRONMENTAL IMPACT REPORTS

FUTURE URBANIZATION AREA #2
SPECIFIC PLAN
ANTIOCH, CALIFORNIA

Prepared by

Mundie & Associates
Consultants in Land Use and Economics
and
City of Antioch

State Clearinghouse # 93-111069
August 25, 1995

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INTRODUCTION

This document contains both the draft and final versions of the Environmental Impact Report on what is now known as the East Lone Tree Specific Plan. (The plan was formerly known as "Future Urbanization Area #2.")

The draft version comes before the final version, with colored title pages serving as section dividers.

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CHAPTER I

SUMMARY

I.A INTRODUCTION

This environmental impact report (EIR) identifies potential significant environmental effects of a project consisting of the Specific Plan for FUA #2, proposed by the City of Antioch. The study area is located on the eastern edge of the City of Antioch, and is bounded on the west by the developing Antioch Southeast Area, on the south by Lone Tree Way, on the east by Empire Avenue and Neroly Road, and on the north by the Contra Costa Canal. The study area is a single contiguous tract of approximately 785 acres, designated in the General Plan as FUA #2. Part of the area was annexed to Antioch in September 1993; annexation of the balance was approved by LAFCo in October 1994, and was approved by the Antioch City Council on January 10, 1995.

The 1988 Antioch *General Plan* update designates the Specific Plan area for eventual urban uses. Development in this area is intended to serve as a major employment center with most of the land to be set aside for future suburban business parks incorporating major offices and light industrial uses. Antioch has completed extensive planning and engineering work relating to FUA #2. That previous work culminated in the preparation of the *Antioch Infrastructure Plan* and its associated *Draft* and *Final EIR*s in 1992.

The 1992 *Infrastructure Plan* EIR analyzed potential development in FUA #2 through the use of three alternative development scenarios which ranged widely in terms of their types and levels of development (the land acreage for commercial and employment uses ranged from 227 to 313 acres and the number of dwelling units ranged from a low of approximately 1,300 to a high of over 2,600). The EIR recommended mitigation measures to address environmental impacts of development in FUA #2, some of which were procedural mitigations or requirements for additional studies to be undertaken at the time of Specific Plan preparation.

I.B SUMMARY DESCRIPTION OF PROJECT

The process of preparing and adopting the Specific Plan alternatives evaluated in this EIR has drawn upon all of the planning and environmental analysis for the Specific Plan area undertaken as part of the City's *General Plan* and the *Infrastructure Plan*. Based on the earlier work along with updated information and a detailed site analysis, alternative development scenarios were formulated and reviewed by City staff and participating landowners, and then refined prior to a formal presentation to the Planning Commission and City Council. The outcome of the planning, consultation, review and refinement process was the definition of a preferred concept plan on which the Specific Plan is based. This EIR analyzes the preferred Specific Plan concept that emerged from the planning process. A fiscal and financial analysis of the Specific Plan alternatives is presented in a separate document.

The approximately 785 acres of the Specific Plan area are divided among eight major owners and four other owners (each of the "other owners" holds no more than 10 acres).

Land uses in the preferred Specific Plan alternative considered in this EIR include a mix of employment, commercial and residential uses along with some public facilities:

Employment Uses. The Plan contains 122 acres that would allow "employment" uses, which include office, light industrial and similar activities. The employment area is located on the relatively flatter portion of FUA #2, east of the hills and the State Route 4 Bypass alignment. Antioch could expect over 2,000,000 square feet of office and light industrial development in this area or an estimated 6,000 workers.

Community Commercial. A 16.1 acre site, comprised of three parcels at the intersection of Laurel Road and the SR 4 Bypass is designated for community commercial uses. These uses would typically include shopping centers that offer supermarkets, drug stores, restaurants and similar locally-oriented outlets. A second site, located along Lone Tree Way, would provide another 8.1 acres of community commercial use.

Employment Center Commercial. An 11.4 acre site on Sunset Drive near the intersection of Empire Avenue and the SPRR tracks is designated for employment center commercial uses. These uses would typically include banks and other financial institutions, professional offices, copy centers convenience retail outlets and restaurants. In general these uses would be "business-oriented."

Regional Commercial. The Plan includes 60.9 acres of regional-serving commercial uses, or over 500,000 square feet of building space, located at the intersection of the State Route 4 Bypass and Lone Tree Way. The designated sites are configured to work with "big box" retail, but could accommodate a shopping center.

Residential Development. A total of up to 1,322 housing units are included in the Specific Plan. Of those, 549 would be low medium density single family homes, built at an average density of four units per acre, and 548 would be medium density single family homes, built at an average density of six units per acre. The remaining 225 units would be medium high density homes, with a maximum density of 15 units per acre.

Public Uses. A ten-acre elementary school site is provided south of Laurel Road. A three-acre fire station site is located in the southwest corner of FUA #2. Contra Costa County owns approximately 11 acres of land in FUA #2 that is designated for public facilities. County staff have indicated that new court and judicial facilities would be developed on this site to serve the east county area.

Parks. A park of approximately 9 acres located at the southerly end of the open space spine. Active recreation facilities, such as soccer and baseball fields, could be located in Lindsey Basin, owned by the Flood Control District and improved by the City through park in-lieu fees.

Open Space. The ridgeline of hills that runs generally in a north-south direction through the western portion of FUA #2 would be preserved as a public view trail. Some modest planting may be undertaken to restore and enhance the natural look of these heavily grazed hills. In addition to the hills, FUA #2 has a second major open space element in Antioch Creek. The creek area will be improved in accordance with the City's Creek Policy. Finally, the Plan shows an open space area between the State Route 4 Bypass and the proposed collector road that parallels the west side of the Bypass.

Circulation. The SR 4 Bypass is the dominant roadway improvement in FUA #2. The road right-of-way would occupy a cross-section of 250 feet, with a capacity of up to eight lanes of travel and the future possibility of a light rail line. Two interchanges are planned: one at Laurel Road and one at Lone Tree Way. Lone Tree Way would be widened to six lanes west of the Bypass and four lanes east of the Bypass. Laurel Road would be extended to a four-lane arterial, and would connect over the railroad tracks to Laurel Road in Oakley.

The collector roads that currently end at the west boundary of FUA #2 – Country Hills Drive, Vista Grande Drive, Canada Valley Road – would be extended into FUA #2. A new collector road, parallel to the west side

of the Bypass, is also proposed to facilitate north-south traffic flow. Another arterial, Sunset Drive, would be built on the east side of the Bypass to provide access to the employment parcels.

Major Utility Systems.

(1) Water supply. Water supply network improvements anticipated to serve the planning area include: (1) pipeline extensions within Laurel Road, Country Hills Drive, Canada Valley Road and Lone Tree Way; and (2) the construction of a new north-south water main within the proposed Sunset Drive.

Water supply source and treatment plant capacity issues are addressed in the *Infrastructure* section of Chapter III. Based on planning studies, it appears that future water demands associated with the development of FUA #2 can be met.

(2) Wastewater Disposal and Treatment. A major trunk sewer line serving the Southeast Area is proposed to run through FUA #2. This line will run down Lone Tree Way, up Empire Road, and then north along the west side of the railroad tracks. The trunk line, which is being sized to handle FUA #2 development, is likely to be under construction in 1996.

(3) Drainage. Storm water would be handled by East Antioch Creek. The existing, temporary channel would be relocated and widened. In its ultimate configuration, the channel will parallel Lone Tree Way, cross under the SR 4 Bypass, and run north between the Bypass and the CCWD pipeline easement.

The channel cross section would be 140 to 180 feet wide in FUA #2. This width is significantly greater than the upstream portion of the channel (located in the Southeast Area), which has a width of approximately 110 feet as it flows through the Seeno Meadow property. The additional width will allow for more vegetation and a more natural looking creek. Bicycle/pedestrian paths will be incorporated along the channel.

(4) Other Utilities. Each utility serving the planning area (PG&E, Pacific Bell and Viacom) will expand their lines, cables and facilities as necessary.

(5) Open Space and Landscaping. A variety of formal and natural open spaces are planned to serve FUA #2 including ridgetop trails and open space, trails and open space along Antioch Creek, the Lindsey Basin Recreation Area, a neighborhood park and an elementary school. These open spaces will provide the community with both active and passive recreation opportunities as well as pedestrian and bicycle access between open space resources.

(6) Urban Design. The urban design concept envisioned for the FUA #2 Specific Plan considers open spaces, the Route 4 Bypass, streets, employment centers and residential areas. Open space will be addressed as a means of providing diverse outdoor experiences for the community and as an integral part of improving the Route 4 Bypass. Employment centers will be designed as campus-like environments with retail outlets and services located in the center. Design standards for residential areas will similarly encourage the mixing of retail and services but with a diversity of housing types. Street design specifications will emphasize the importance of the pedestrian as well as the creation of identity and sense of place.

Together with the EIR prepared for the *Antioch Infrastructure Plan*, this EIR covers environmental review for the following actions: adoption of Specific Plan; amendment of Antioch General Plan; construction of capital improvements to serve planned FUA development in conformance with the Specific Plan; other City land use approvals and development permits consistent with the Specific Plan; possible general or individual permit(s)

from U.S. Army Corps of Engineers for activities involving dredging or fill within waters of the U.S.; and streambed alteration permit(s) from the California Department of Fish and Game.

I.C PROJECT IMPACTS AND MITIGATION MEASURES

A. Land Use

Impact	Mitigation Measures
No significant land use impacts would result from development allowed under the proposed plan. The addition of 1,322 housing units would increase the City's housing stock by 1.8 percent. The addition of 122 acres of employment uses would more than double this category on a citywide basis. The addition of 96.5 acres of commercial uses would increase those uses by just over 40 percent. The addition of approximately 8,335 jobs in FUA #2 would represent 6.3 jobs per housing unit, a change that would lead Antioch's jobs/housing balance closer toward the county average of 1:1. ❶	No mitigation measures are required.

B. Transportation

Near Term Phase I Impacts

Impact B1: The addition of project traffic would worsen deficient conditions at the following intersections:

- Lone Tree Way/James Donlon Blvd.
- Lone Tree Way/Fairview Ave.
- Lone Tree Way/Dallas Ranch Rd. ❷

Mitigation Measures B1a-B1c: The following intersection improvements would be needed to mitigate deficient conditions to an acceptable level:

B1a Lone Tree Way/James Donlon Blvd.
- ➢ Add 2nd eastbound right-turn lane or channelized "free-right" and 2nd northbound left-turn lane.

B1b Lone Tree Way/Fairview Ave.
- ➢ Will operate at acceptable conditions with planned year 2010 widenings.

B1c Lone Tree Way/Dallas Ranch Rd.
- ➢ Add exclusive eastbound right-turn lane. ❸

Symbols for Pre-Mitigation
Levels of Significance
- ❶ Less than Significant Impact
- ❷ Significant Impact

Symbols for Post-Mitigation
Levels of Significance
- ❸ Mitigable to Level of Less than Significant Impact
- ❹ Significant Unavoidable Impact

B. Transportation *(continued)*

Near Term Phase I Impacts

Impact	Mitigation Measures
Impact B2: The project would deteriorate level of service to unacceptable levels at the following intersections: • SR 4 eastbound ramps/Lone Tree Way • Sunset Drive/Laurel Rd. • Deer Valley Rd./Lone Tree Way ❷	**Mitigation Measures B2a-B2c:** The following intersection improvements would be needed to mitigate deficient conditions to an acceptable level: **B2a** SR 4 eastbound ramps/Lone Tree Way ➢ Add 2nd eastbound right-turn lane or channelized "free-right". **B2b** Sunset Drive/Laurel Rd. ➢ Add 2nd southbound left-turn lane. **B2c** Deer Valley Rd./Lone Tree Way ➢ Add exclusive eastbound right-turn lane. ❸
Impact B3: The new intersection of Sunset Drive/Wild Horse Drive would operate at unacceptable conditions with project traffic. ❷	**Mitigation Measure B3:** This intersection will operate at acceptable conditions with planned 2010 widenings. ❸
Impact B4: The five intersections listed below currently meet the peak hour signal warrant and would meet the peak hour signal warrant for the Project scenario. • Deer Valley Rd./Balfour Rd. • Sand Creek Rd./Lone Tree Way • Fairview Ave./Sand Creek Rd. • O'Hara Ave./Lone Tree Way • Empire Ave./Lone Tree Way ❷	**Mitigation Measures B4a-B4e:** Signalize intersections. ❸
Impact B5: The following intersections would meet the peak hour signal warrant (in at least one peak hour) for the Project scenario: • Sunset Drive/Lone Tree Way	**Mitigation Measures B5a-B5f:** Signalize intersections. ❸

Symbols for Pre-Mitigation Levels of Significance
- ❶ Less than Significant Impact
- ❷ Significant Impact

Symbols for Post-Mitigation Levels of Significance
- ❸ Mitigable to Level of Less than Significant Impact
- ❹ Significant Unavoidable Impact

B. Transportation *(continued)*

Near Term Phase I Impacts

Impact	Mitigation Measures
Impact B5: *(continued)* ◆ Empire Ave./Laurel Rd. ◆ Canada Valley Rd./Lone Tree Way ◆ Sunset Dr./Laurel Rd. ◆ Sunset Dr./Wild Horse Drive ◆ Lone Tree Way/Regional Commercial Use Driveway ❷	

B. Transportation

Long Term (Recent Trends) Phase II Impacts

Impact B6: The addition of project traffic would worsen deficient conditions at the following locations:

- SR 4 westbound ramps/Lone Tree Way
- SR 4 westbound ramps/Hillcrest Ave.
- SR 4 eastbound ramps/Hillcrest Ave.
- Lone Tree Way/James Donlon Blvd.
- Dallas Ranch Rd./Lone Tree Way
- Hillcrest Ave./Lone Tree Way ❷

Mitigation Measures B6a-B6f: The following intersection improvements would mitigate deficient conditions to an acceptable level:

B6a SR 4 westbound ramps/Lone Tree Way
- ➢ Add 2nd northbound left-turn lane

B6b SR 4 westbound ramps/Hillcrest Ave.
- ➢ Add 2nd northbound left-turn lane

B6c SR 4 eastbound ramps/Hillcrest Ave.
- ➢ Channelized "Free-Right" and exclusive northbound right-turn lane

B6d Lone Tree Way/James Donlon Blvd.
- ➢ Add exclusive eastbound right-turn lane and 2nd northbound left-turn lane

B6e Dallas Ranch Rd./Lone Tree Way
- ➢ Add exclusive eastbound right-turn lane and 2nd northbound left-turn lane

B6f Hillcrest Ave./Lone Tree Way
- ➢ Add exclusive southbound and westbound right-turn lanes ❸

Symbols for Pre-Mitigation
Levels of Significance
- ❶ Less than Significant Impact
- ❷ Significant Impact

Symbols for Post-Mitigation
Levels of Significance
- ❸ Mitigable to Level of Less than Significant Impact
- ❹ Significant Unavoidable Impact

B. Transportation *(continued)*

Long Term (Recent Trends) Phase II Impacts

Impact	Mitigation Measures
Impact B7: The following intersections would deteriorate to deficient level of service conditions as a result of the Project: • Deer Valley Rd./New Sand Creek Rd. • Deer Valley Rd./Lone Tree Way • Dallas Ranch Rd./New Sand Creek Rd. • Hillcrest Ave./Laurel Ave. • Dallas Ranch Rd./Lone Tree Way ❷	**Mitigation Measures B7a-B7e:** The following intersection improvements would be needed to mitigate deficient conditions to an acceptable level: **B7a** Deer Valley Rd./New Sand Creek Rd. ➢ Add exclusive southbound right-turn lane and 2nd eastbound left-turn lane **B7b** Deer Valley Rd./Lone Tree Way ➢ Add exclusive eastbound and northbound right-turn lanes **B7c** Dallas Ranch Rd./New Sand Creek Rd. ➢ Add 2nd southbound left-turn lane **B7d** Hillcrest Ave./Laurel Ave. ➢ Add exclusive eastbound right-turn lane **B7e** Dallas Ranch Rd./Lone Tree Way ➢ See Mitigation Measure B6 ❸
Impact B8: The five intersections listed below currently meet the peak hour signal warrant and would meet the peak hour signal warrant for the Project scenario. • Lone Tree Way/Sand Creek Rd. • Empire Ave./Laurel Rd. • O'Hara Ave./Lone Tree Way • Sunset Drive/Laurel Rd. • Dallas Ranch Rd./Lone Tree Way ❷	**Mitigation Measures B8a-B8e:** Signalize intersections. ❸
Impact B9: The fifteen intersections listed on the following page would meet the peak hour signal warrant (in at least one peak hour) for the Project scenario.	**Mitigation Measures B9a-B9o:** Signalize intersections. ❸

Symbols for Pre-Mitigation Levels of Significance
- ❶ Less than Significant Impact
- ❷ Significant Impact

Symbols for Post-Mitigation Levels of Significance
- ❸ Mitigable to Level of Less than Significant Impact
- ❹ Significant Unavoidable Impact

B. Transportation *(continued)*

Long Term (Recent Trends) Phase II Impacts

Impact	Mitigation Measures
Impact B9: *(continued)* ◆ Deer Valley Rd./New Sand Creek Rd. ◆ Sunset Drive/Lone Tree Way ◆ Canada Valley Rd./Lone Tree Way ◆ Dallas Ranch Rd./New Sand Creek Rd. ◆ Hillcrest Ave./New Sand Creek Rd. ◆ New Sand Creek Rd./Kaiser Driveway ◆ New Sand Creek Rd./Zone 451 Residential Access ◆ New Sand Creek Rd./South Dallas Ranch Rd. ◆ New Sand Creek Rd./Zone 453 Residential Access ◆ Dallas Ranch Rd./Zone 434 Residential Access ◆ Deer Valley Rd./Kaiser Access ◆ Deer Valley Rd./Zones 434/455 Residential Access ◆ Hillcrest Ave./Zones 459/460 Residential Access ◆ Lone Tree Way/Regional Commercial Driveway ◆ Lone Tree Way/Regional Commercial Driveway	

B. Transportation

Internal Circulation

Impact B10: Access to onsite commercial and employment areas has not yet been developed. ❷	**Mitigation Measure B10:** Address in subsequent plans. ❸

Symbols for Pre-Mitigation Levels of Significance
- ❶ Less than Significant Impact
- ❷ Significant Impact

Symbols for Post-Mitigation Levels of Significance
- ❸ Mitigable to Level of Less than Significant Impact
- ❹ Significant Unavoidable Impact

B. Transportation *(continued)*

Internal Circulation

Impact	Mitigation Measures
Impacts B11, B12, B13: Intersection spacing, roadway widths, sidewalks and bike lanes have not been designed to City standards. ❷	**Mitigation Measures B11, B12, B13:** Intersections, roadways, sidewalks and bike lanes will be designed in subsequent plans to meet City standards. ❸
Impact B14: Provision for bicycle parking, showers in employment centers and other facilities to encourage bicycle use, and bicycle connections to adjacent development are not yet specified for the project. ❷	**Mitigation Measure B14:** Address in subsequent plans. ❸
Impacts B15, B16, B17: School pedestrian access, emergency vehicle access and parking are not yet specified for the project. ❷	**Mitigation Measures B15, B16, B17:** Address in subsequent plans. ❸
Impact B18: Project construction traffic will increase traffic and congestion on local roadways and intersections. ❷	**Mitigation Measure B18:** Develop a detailed construction traffic plan. ❸
Impact B19: Transit routes serving the project and bus stops have not been identified. ❷	**Mitigation Measure B19:** There are two factors that will improve the transit accessibility of the project: (1) The project should be designed to allow for ready access to arterial and collector streets by pedestrians. This means that cul-de-sacs that back onto arterial and collector streets should have a pedestrian/bicycle link between the cul-de-sac and the main road. (2) Bus turnouts and passenger shelters should be provided on major streets to accommodate future transit service. Transit routes will need to be addressed in subsequent plans. ❸
Impact B20: Many additional roadways and intersections would be significantly impacted if one phase of the project were built entirely before the other phase (i.e., housing before employment). ❷	**Mitigation Measure B20:** Implement incentives for employment-bearing land uses to help assure that employment in FUA #2 will be established in the same general time frame as housing. ❸

Symbols for Pre-Mitigation Levels of Significance
- ❶ Less than Significant Impact
- ❷ Significant Impact

Symbols for Post-Mitigation Levels of Significance
- ❸ Mitigable to Level of Less than Significant Impact
- ❹ Significant Unavoidable Impact

C. Air Quality

Impact	Mitigation Measures
Impact C1. BAAQMD standards for regional emissions of ROG, NOx, SO_2 and PM-10 would be exceeded. Guidelines issued by the BAAQMD for the evaluation of project impacts, consider emission increases for regional pollutants to be significant if they exceed 150 pounds per day. Buildout of the Specific Plan would exceed the threshold by several times over. ❷	**Mitigation Measures C1a and C1b:** **C1a** The proposed project shall demonstrate compliance with the air quality policies of the *Antioch General Plan*. More specifically, it should ensure that the local circulation system encourages and accommodates the use of transportation modes other than the automobile. **C1b** Antioch's Transportation Demand Management (TDM) ordinance shall be applied to all phases of the development within the planning area and include specific trip reduction goals and enforcement procedures. The available strategies for meeting the TDM goals are listed on page 70. ❹
Impact C2: Fugitive dust would be generated during the construction period. ❷	**Mitigation Measure C2:** The following steps shall be taken to control construction period fugitive dust in all phases of project development beyond Phase I: • Provide equipment and staffing for watering of all exposed or disturbed soil surfaces at least twice daily. • Water or cover stockpiles of debris, soil, sand or other materials that can be blown by the wind. • Sweep construction areas and adjacent streets of all mud and debris, since this material can be pulverized and later resuspended by vehicle traffic. • Limit the speed of all construction vehicles to 15 miles per hour while on site. • Suspend earthmoving and other dust-producing activities during periods of high winds. ❸

D. Noise

Impact D1: Construction-related noise levels would result in a significant noise impact upon existing and future sensitive	**Mitigation Measures D1a-D1c:** **D1a** Noise-generating construction equipment, including truck traffic

Symbols for Pre-Mitigation Levels of Significance
- ❶ Less than Significant Impact
- ❷ Significant Impact

Symbols for Post-Mitigation Levels of Significance
- ❸ Mitigable to Level of Less than Significant Impact
- ❹ Significant Unavoidable Impact

D. Noise *(continued)*

Impact	Mitigation Measures
Impact D1: *(continued)* receptors in the area. ❷	**Mitigation Measures D1a-D1c:** *(continued)* **D1a** to and from the site for any purpose, should be limited to the hours of 8:00 AM to 5:00 PM. Trucks should be restricted to major arterial roadways and should avoid residential neighborhoods when possible. **D1b** All construction equipment shall be properly muffled and maintained. **D1c** All stationary noise-generating construction equipment, such as air compressors, should be located as far as practical from residences. Such equipment, when near occupied residences, should be acoustically shielded where possible using wood screens or other available barriers such as construction trailers. "Quiet" construction equipment, particularly air compressors, shall be selected whenever possible. The prudent selection of such equipment, along with the use of proper mufflers, should result in maximum construction - related noise generated by a particular piece of equipment or no more than 85 dBA when measured at a distance of 50 feet from a piece of equipment operating at its noisiest mode. ❸
Impact D2: Traffic noise within the Specific Plan area could exceed applicable guidelines at new residential receptors. ❷	**Mitigation Measures D2a and D2b:** **D2a** A combination of open space buffer zones and/or noise barriers along roadways could be used to reduce the CNEL to 60 dBA or less. Noise barriers and open space buffer zones are discussed in the text at p. 78. **D2b** All single- and multi-family housing located within the 60 dBA CNEL contour shall be designed such that the indoor CNEL level shall not exceed 45 dBA. The designs for the housing shall be reviewed by a qualified acoustical engineer and the necessary noise control treatments incorporated into the design. All such units shall be provided with forced air ventilation systems so that windows may be kept closed at the discretion of the occupants for noise control. Additional noise control treatments could include sound rated windows and doors. A report shall be prepared following the requirements of Title 24, Part 2 of the California Administrative Code for all multi-family housing within the 60 CNEL contour distances. A similar report shall be provided for single-family housing to the City of Antioch. ❸

Symbols for Pre-Mitigation
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- ❶ Less than Significant Impact
- ❷ Significant Impact

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E. Geology, Soils and Seismicity

Impact	Mitigation Measures
Impact E1: Soils on hillslopes could be subject to slope failure and erosion. ❷	**Mitigation Measure E1:** A grading plan shall be prepared by the site developer for final design review of the project. Pursuant to Uniform Building Code requirements, the grading plan shall be prepared by a licensed civil engineer and include soils engineering and engineering geology reports. The grading plan shall accurately show all cut and fill areas and provide calculated earthwork volumes. The grading plan shall also address erosion control and describe drainage facilities. The soil engineering and engineering geology reports required for the grading plan shall specifically address the slope stability of any proposed cut slopes and potentially unstable areas, including north-northeastern slopes, and their suitability for any proposed building, roadway, or other infrastructure development. Their recommendations shall be included in the grading and building plans prepared for the project. All grading activities shall be continuously inspected by the project geotechnical engineer in order to ensure that recommendations are incorporated during field activities. A series of recommendations to be considered during the preparation of the grading plan(s) for the site are listed no pp. 103-104. ❸
Impact E2: Structures could sustain damage from differential settlement due to weak or expansive soils. ❷	**Mitigation Measure E2:** The soils engineering and engineering geology reports shall identify areas where weak and expansive soil would likely affect proposed development and provide design specifications for minimizing the potential for damage due to weak and expansive soils. A series of measures to be considered in the design of structures is presented on p. 104. ❸
Impact E3: Strong ground shaking during an earthquake could cause structural damage and slope failure, and could result in injuries to the public. ❷	**Mitigation Measures E3a and E3b:** **E3a** Site planning and building design shall incorporate provisions to reduce risk to life and property from seismic activity. **E3b** All buildings, underground utilities, and other improvements shall be designed and constructed in accordance with seismic design criteria presented in the Uniform Building Code. Hazards can be reduced by engineered structural components that minimize damage from ground shaking and firmly anchoring non-structural objects that may become hazards due to ground shaking. The engineering geology report shall include structural design criteria that would minimize impacts to the project associated with strong

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E. Geology, Soils and Seismicity *(continued)*

Impact	Mitigation Measures
	Mitigation Measures E3a and E3b: *(continued)* ground shaking during an earthquake. The report shall identify any liquefaction hazards that may exist. The engineering geology report shall provide design criteria for structures in areas that may undergo liquefaction during an earthquake. Alternatively, building shall not be permitted in areas subject to liquefaction. ❸
Impact E4: Urban development on the east side of the planning area could expose future population to safety risks in connection with natural gas extraction activities. ❷	**Mitigation Measure E4:** Implement actions to protect the public from risks associated with natural gas extraction activities, for the duration of those activities. Actions associated with this mitigation measure are listed in Chapter III on p. 95. ❸

F. Flooding and Drainage

Impact F1: Potential degradation of water quality during construction. ❷	**Mitigation Measure F1:** Water quality of runoff is regulated by the Federal National Pollution Discharge Elimination System (NPDES) Program and administered by the California Regional Water Quality Control Boards. The Central Valley Regional Water Quality Control Board (RWQCB) issues NPDES nonpoint source permits for discharges to water bodies in the North Coast region for municipalities and major industries. Projects disturbing more than five acres of land during construction are required to file a Notice of Intent (NOI) to be covered under the State NPDES General Construction Permit for discharges of storm water associated with construction activity. A project sponsor must propose control measures that are consistent with the State General Permit. A Storm Water Pollution Prevention Plan (SWPPP), based on Best Management Practices (BMPs) shall be developed and implemented for each site covered by the general permit. A SWPPP should be prepared that, when properly implemented, would reduce or eliminate impacts to surface water quality from all phases of the project. Required elements of the SWPPP are listed on p. 112 of Chapter III. ❸
Impact F2: Portions of the planning area are located in the 100-year flood	**Mitigation Measure F2:** Prior to development of the areas designated as within the 100-year flood zone, improvements to the East

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F. Flooding and Drainage *(continued)*

Impact	Mitigation Measures
Impact F2: *(continued)*	**Mitigation Measure F2:** *(continued)*
hazard zone and could be subject to damage during flooding. ❷	Antioch Creek channel and Lindsey Basin shall be made that would increase the capacities of these drainage system components to allow conveyance and/or storage of the 100-year flows. The design and construction of the improvements shall be the responsibility of the Contra Costa County Flood Control District (CCCFCD) in tandem with the developer(s) of projects within these areas. The design shall consider total buildout of the planning area and all cumulative projects which drain to East Antioch Creek and potential downstream flooding effects. When CCCFCD has accepted a design for improvements, the District shall request a Conditional Letter of Map Revision from FEMA. Upon approval by FEMA, the developer will work with CCCFCD to obtain necessary authorizations, permits and financing to implement the flood protection improvements. ❸
Impact F3: Development of the planning area would result in the construction of impervious surfaces, causing an increase in the volume and velocity of storm water runoff and potentially increasing flooding hazards. ❷	**Mitigation Measure F3:** A tentative map for each phase of development of the project would be submitted to the City of Antioch Department of Community Development (ADCD), Building Division for review. Grading and drainage plans would be reviewed for compliance with City requirements by the ADCD, Engineering Division. Any undersized components in the downstream storm drain system would be identified at that time and new design required prior to plan approval. ❸

G. Public Safety

Impact G1: Construction workers and the public may be exposed to potentially hazardous materials during project development. ❷	**Mitigation Measure G1:** Releases of fuel products from pipelines are the responsibility of the pipeline owner. If releases have occurred, the pipeline owner shall investigate and remediate soil and groundwater according to state and local regulations. Accurate locations of pipelines and easements shall be determined and marked prior to development in areas adjacent to the pipelines. The developer shall contact pipeline owners and request procedures or restrictions for moving heavy equipment over pipelines, if such movement is likely to occur over pipelines other than at established crossings. Contractors for the project shall develop a site safety and hazardous

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G. Public Safety *(continued)*

Impact	Mitigation Measures
	Mitigation Measure G1: *(continued)* materials management plan. The plan shall include elements outlined on p. 122 and shall be reviewed and approved by agencies listed there. An asbestos survey shall be conducted at all buildings (proposed to be demolished or renovated) constructed prior to the 1970s, or suspected of having asbestos-containing materials. If asbestos-containing materials are found to be present, they shall be remediated in accordance with regulations and notification requirements of the Bay Area Air Quality Management District. A preliminary site assessment (for hazmat) shall be conducted. Details specifications for the site assessment and subsequent steps are provided on pp. 122-123. Areas with confirmed releases of potentially hazardous materials shall be investigated/remediated according to requirements of the CCCEHD or other applicable regulatory agency. ❸
Impact G2: Potential health impacts may result from exposure to electromagnetic fields, PCBs and effects associated with overhead electrical lines. ❷	**Mitigation Measure G2:** Because the potential health effects of EMF exposure have not been confirmed by scientific studies, information on the health issues of EMF exposure and the exposure profiles from overhead transmission lines shall be provided by the developer to individuals who may reside near transmission lines with annual updates summarizing the results of the most recent studies pertaining to EMF exposure. Prior to development plan submittal, all existing transformers shall be checked for the presence of PCBs by PG&E. If PCBs are present, PG&E shall remove and replace the equipment with non-PCB containing equipment. If any leaks or spills are discovered during this activity or during a preliminary site assessment, an investigation shall be conducted by a qualified environmental consultant to assess impacts from the release and propose remedial actions. Any remediation of PCBs shall be completed prior to development of the parcel in question. All metal structures or objects located adjacent to transmission line easements shall be properly grounded to prevent electrical shocks from persons or animals in contact with those objects. ❸

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G. Public Safety *(continued)*

Impact	Mitigation Measures
Impact G3: Development of the project site would result in an increase in the use, storage and disposal of hazardous materials. ❷	**Mitigation Measure G3:** Existing federal, state and local hazardous materials laws and regulations, and household hazardous waste programs would mitigate potential hazards associated with hazardous materials management. Reduction of hazardous materials use by small businesses and households can be encouraged through education. Several mitigations steps that can be taken are outlined on pp. 123-124. ❸
Impact G4: Development of the project could result in exposure of people to potential hazards associated with gas exploration and production. ❷	**Mitigation Measure G4:** Any development in the vicinity of the existing operating gas well shall be designed to conform with setback requirements for a "critical well", as defined in State Onshore Well Regulations (see p. 124 for details). Construction of structures for human occupancy over abandoned gas wells shall be discouraged. Geotechnical reports prepared for grading plans shall include identification of the location of all abandoned gas wells. If abandoned wells are identified, the method of abandonment shall be described and evaluated for possible hazards. The design of any structure for human occupancy located over an abandoned gas well shall incorporate gas/vapor barrier systems with appropriate provisions for ventilation of accumulating gas. ❸

H. Public Services

Impact H1: Development allowed by the proposed plan would require the construction of new facilities and the possible expansion of existing facilities. ❷	**Mitigation Measure H1:** Projects within the Specific Plan area shall pay CCCCFD fees applicable at the time development proceeds. Incorporate CCCCFD planning input into project design and approval to ensure that adequate provisions are made for access, water supply and compliance with Fire Code requirements. Coordinate the timing of development in the Specific Plan area with CCCCFD construction and staffing of new stations, in order to prevent excessive response times and the depletion of resources that serve existing development. ❸
Impact H2: Commercial and industrial development would require water flow for fire protection. ❷	**Mitigation Measure H2:** The proposed plan specifies the appropriate water main sizes to deliver flows at the required rate. ❸

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H. Public Services *(continued)*

Impact	Mitigation Measures
Impact H3: Project buildout would significantly increase enrollment, requiring the provision of additional schools and/or classrooms. ❷	**Mitigation Measures H3a-H3d:** **H3a** Accommodate increased enrollment by a variety of strategies, including provision of portable facilities, year-round education, double sessions and construction of new facilities. **H3b** Require portions of FUA #2 that are within the AUSD to join the current Mellos-Roos District or provide an alternate funding mechanism for construction of school facilities. **H3c** Require portions of FUA #2 that are within the BUESD to join the existing development agreement with the school district or provide an alternate funding mechanism for construction of elementary and middle school facilities. **H3d** Require portions of FUA #2 that are within the LUHSD to provide a funding mechanism for construction of high school facilities. ❸

I. Infrastructure

Impact I1: Existing local roadway facilities would need to be extended and new vehicular circulation and access facilities would need to be provided. ❷	**Mitigation Measures I1a-I1c:** **I1a** Completion of roadway improvements (Chapter III contains a complete listing of these improvements on p. 29). **I1b** Provision of access and circulation routes to specific parcels. **I1c** Compliance with City and State standards (or as modified by Specific Plan guidelines) in circulation and parking design and construction, including, but not limited to, parking standards, handicap requirements, fire equipment access, site distances, etc. Plans for extension and/or upgrading of public roads and for design and construction of internal driveways, circulation and parking facilities, shall be submitted to the City of Antioch Department of Community Development (ADCD), Engineering Division, for review and compliance with City requirements and standards. ❸

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I. Infrastructure *(continued)*

Impact	Mitigation Measures
Impact I2: Domestic water supply infrastructure would need to be extended for water storage, pumping and conveyance. ❷	**Mitigation Measures I2a and I2b:** **I2a** Construction of water system improvements (Chapter III contains a complete listing of these improvements on p. 131). **I2b** Compliance with City design and construction standards, including connections as required by the City of Antioch's ADCD, Engineering Department and internal water distribution plans meeting City standards for various land uses, fire flows and landscape needs. Compliance with City design standards. City review and approval of water plans is required and the Contra Costa Fire Protection District should be consulted relative to the required fire flows and access. Recycling of wastewater or the use of surplus Irrigation District water or raw river water may be considered for the planning area. This type of water recycling to service future demands should be explored in greater detail. ❸
Impact I3: Sewer lines ranging in size from 8" to 12" would need to be extended to form a comprehensive collection system. ❷	**Mitigation Measures I3a- I3c:** **I3a** Extension of sewer lines ranging in size from 8" to 12". **I3b** Compliance with City design and construction standards, including incorporating sewer connection requirements, manholes and any other needed improvements in the overall design and submitting those plans for City review and approval. **I3c** Designing internal sewer collection system to address City, State and Federal standards regarding disposal of hazardous materials (from the commercial sites) and submitting plans for such systems to the appropriate responsible agency, as identified under Section III.G. ❸
Impact I4: Development of the planning area will increase the demand for electrical, natural gas, cable and telephone services. ❷	**Mitigation Measure I4:** Development applicants shall provide documentation to the City that these services can be provided for all phases of the project in a timely manner. Applicants shall coordinate with the utility companies and the City in planning and

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I. Infrastructure *(continued)*

Impact	Mitigation Measures
	Mitigation Measure I4: *(continued)* scheduling future facilities for the Planning Area. All utilities shall be located below grade and designed according to the City of Antioch's street and infrastructure guidelines. ❸
Impact I5: Existing oil pipelines and irrigation laterals may need to be relocated during the course of roadway improvements, where feasible. ❷	**Mitigation Measure I5:** Development applicants shall coordinate with the pipeline and irrigation companies and appropriate Health and Safety Agencies with regard to the design, timing, access and easement requirements related to respective utility relocation. ❸

J. Vegetation and Wildlife

Impact J1: Wetland habitats within the planning area would be lost or periodically modified by development envisioned by the proposed plan. ❷	**Mitigation Measure J1:** Development allowed by the proposed plan would affect a seasonal wetland of approximately 1.7 acres, the exact boundaries of which are uncertain due to the existence of offsite drainage facilities of an interim nature. The developer of any subsequent project(s) shall be required to have a formal wetland delineation undertaken and verified by the Army Corps of Engineers. Based on that delineation, the developer may be required to have a wetland replacement plan prepared and shall commit to its implementation in a manner, and on a schedule, acceptable to the Corps and to the City of Antioch. ❸
Impact J2: Water quality in East Antioch Creek would be degraded. ❷	**Mitigation Measure J2:** A site management plan shall be developed which provides for: (1) baseline studies conducted prior to construction which establish existing water quality in the creek during winter flows; (2) best management practices consistent with existing National Pollution Discharge Elimination System (NPDES) permits regulating non-point source pollution; (3) quarterly monitoring of water quality in the creek to ensure that state standards are met; and (4) remedial measures which would be implemented should water quality in the creek diminish below state water quality standards. ❸
Impact J3: Active raptor nests could be disturbed. ❷	**Mitigation Measure J3:** Construction activities during the nesting season (February through July) could disturb nesting raptors and

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J. Vegetation and Wildlife *(continued)*

Impact	Mitigation Measures
	Mitigation Measure J3: *(continued)* should be preceded by surveys conducted by a qualified ornithologist. If nesting raptors are located in proposed construction areas such that nesting success will be doubtful, then construction should be postponed until the nesting season is over. ❸

K. Cultural Resources

Impact K1: Potential presence of subsurface resources at site CA-CCo-691H. ❷	**Mitigation Measure K1:** Given that the presence of pre-1900 subsurface resources at site CA-CCo-691H cannot be ruled out, it is recommended that initial ground-disturbing construction activities within the site boundaries be monitored by a qualified archeologist for the presence of artifacts or features of the historic era. A detailed description of monitoring procedures and contingencies in the event that potentially significant resources are uncovered are provided on pp. 156-157. ❸
Impact K2: Human remains could be discovered during construction. ❷	**Mitigation Measure K2:** The main text (p. 157) outlines the procedural requirements of CEQA, the California Health and Safety Code, and the Public Resources Code in the event that human remains are unearthed on the site during construction. ❸

L. Visual Resources

Impact L1: The Specific Plan, if not responsive to City policies with regard to the protection of important visual resources, could reduce the value of those resources and fail to take advantage of the aesthetic and amenity value that they can contribute to urban development. ❷	**Mitigation Measure L1:** Site planning and grading plans shall respect the integrity of the ridge that is an important visual resource of the planning area. ❸
Impact L2: Specific Plan development could lead to adverse visual impacts or demonstrably negative aesthetic effects.	**Mitigation Measures L2a and L2b:** **L2a** Utilize site plan review and design review to mitigate any

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L. Visual Resources *(continued)*

Impact	Mitigation Measures
Impact L2: *(continued)*	**Mitigation Measures L2a and L2b:** *(continued)*
An adverse visual impact that may reasonably be expected to occur in FUA #2 would be the result, not of the Specific Plan itself, but of construction of the SR 4 Bypass: provision of sound walls. There is a possibility, although a remote one, that other elements of future development might result in adverse visual effects. ❷	**L2a** adverse aesthetic impacts of the Specific Plan. The City's Design Review Board will be the principal implementing agency of the design guidelines in the Specific Plan. All projects and specific development that come before the Board will be considered in light of those guidelines. The Board may refine a project's site layout, building plans, landscaping, building design and handling of specific site and project features in the course of design review, to assure consistency of individuals projects with the direction adopted the Specific Plan. **L2b** The City of Antioch should take steps, as part of its participation in planning for the SR 4 Bypass, to assure that sound attenuation elements of the Bypass satisfy the city's design guidelines. ❸

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I.C CUMULATIVE IMPACTS

Transportation.

(1) Impacts on Highways and Traffic Service Objectives. None of the five study roadways exceeds the traffic index threshold for travel time and traffic delay under either the Without Project or Project scenarios.

(2) Impacts on Intersections. A total of 12 intersections would operate at deficient conditions in at least one peak hour for the Without Project scenario:

- SR 4 westbound ramps/Lone Tree Way
- SR 4 eastbound ramps/Lone Tree Way
- SR 4 westbound ramps/Hillcrest Avenue
- SR 4 eastbound ramps/Hillcrest Avenue
- Lone Tree Way/James Donlon Boulevard
- Empire Avenue/Laurel Road
- Hillcrest Avenue/Lone Tree Way
- SR 4 Bypass/Sand Creek Road
- SR 4 Bypass/Balfour Road
- Dallas Ranch Road/Lone Tree Way
- Deer Valley Road/Lone Tree Way
- Fairview Avenue/Lone Tree Way

The addition of project traffic would worsen deficient conditions at all 12 locations listed above.

The following intersections would deteriorate to deficient level of service conditions as a result of the Project:

- Deer Valley Road/New Sand Creek Road
- Sunset Drive/Lone Tree Way
- Sand Creek Road/Lone Tree Way
- Empire Avenue/Laurel Road
- Hillcrest Avenue/Laurel Road
- Dallas Ranch Road/New Sand Creek Road
- Deer Valley Road/Hillcrest Avenue

Traffic conditions at several intersections would improve as a result of the project. All of these intersections would continue to operate at acceptable conditions. It is noted that Sunset Drive/Wild Horse Drive would operate at deficient conditions in the Near Term Project scenario and acceptable conditions in the Long Term (East County Forecast) Project scenario.

The following intersections would meet the peak hour signal warrant in at least one peak hour in the Without Project scenario:

- Lone Tree Way/Sand Creek Road
- Fairview Avenue/Sand Creek Road
- Empire Avenue/Laurel Road
- O'Hara Avenue/Laurel Road
- O'Hara Avenue/Lone Tree Way

- Empire Avenue/Lone Tree Way
- Sunset Drive/Laurel Road

The seven intersections listed above would also meet the peak hour warrant for the Project scenario.

The following intersections would meet the peak hour warrant (in at least one peak hour) for the Project scenario:

- Deer Valley Road/New Sand Creek Road
- Deer Valley Road/Balfour Road
- Sunset Drive/Lone Tree Way
- Canada Valley Road/Lone Tree Way
- Dallas Ranch Road/New Sand Creek Road
- Hillcrest Avenue/New Sand Creek Road
- New Sand Creek Road/Kaiser Driveway
- New Sand Creek Road/Zone 451 Residential Access
- New Sand Creek Road/South Dallas Ranch Road
- Dallas Ranch Road/Zone 434 Residential Access
- Deer Valley Road/Kaiser Access
- Deer Valley Road/Zones 434/455 Residential Access
- Hillcrest Avenue/Zones 459/460 Residential Access
- Lone Tree Way/Regional Commercial Driveway
- Lone Tree Way/Regional Commercial Driveway

Air Quality. The FUA #2 Specific Plan would contribute to the projected continuation of the violation of standards for emissions of regional pollutants in the Bay Area, which would constitute a significant cumulative air quality impact.

Noise. The noise analysis presented in Chapter III is based on noise sources that include cumulative levels of traffic (Long Term - East County Model Forecast) as defined in this chapter. Two impacts were found to be potentially significant: (1) construction noise impacts; and (2) exposure of residential developments (primarily along the east side of the SR 4 Bypass) to noise in excess of 60 dBA CNEL. Mitigation measures are recommended to reduce any impacts to less-than-significant levels.

Infrastructure. Given the choices available, no adverse cumulative impact on *water supply* would result from development as envisioned by the proposed FUA #2 Specific Plan. Given the availability of existing and potential treatment capacity, no adverse cumulative impacts on *wastewater treatment capacity* would result from development envisioned by the proposed FUA #2 Specific Plan.

Vegetation and Wildlife. The regional cumulative effects on biotic habitats resulting from the development of FUA #2 are expected to be less than significant. There would be no site-specific impacts to special status plants predicted for FUA #2, therefore no cumulative effects are anticipated. Development would make a less-than-significant contribution to the cumulative effects of regional development on a select set of animal species.

I.D AREAS OF CONTROVERSY

The Notice of Preparation for this project was widely circulated and numerous comment letters were received

in response thereto. None of the individual comments or requests for analysis in the comment letters—which were received exclusively from federal, state, and municipal agencies, special districts and quasi-public organizations—involved controversial topics. The contents of the comment letters could generally be characterized as standard for CEQA analysis of a public planning document like the Specific Plan for FUA #2.

CHAPTER II

PROJECT DESCRIPTION

II.A INTRODUCTION

This project-level environmental impact report (EIR) identifies potential significant environmental effects of a project consisting of the Specific Plan for Future Urbanization Area (FUA) #2, proposed by the City of Antioch.

The Draft Specific Plan has been prepared for the City of Antioch by ELS/Elbasani & Logan and is available for review at the City of Antioch, Department of Development Services. This Draft EIR reflects the Planning Commission review version of the Draft Specific Plan, August, 1995.

This EIR has been prepared in accordance with the California Environmental Quality Act (CEQA) of 1970, as amended, and state and local guidelines for the implementation of CEQA. Information on the proposed project is drawn from the Initial Study of Environmental Significance (November 3, 1993), included as Appendix A and research undertaken by the EIR consultant.

II.B PROJECT LOCATION

The study area is located on the eastern edge of the City of Antioch, and is bounded on the west by the developing Antioch Southeast Area, on the south by Lone Tree Way, on the east by Empire Avenue and Neroly Road, and on the north by the Contra Costa Canal.[1] The study area is a single contiguous tract of approximately 785 acres, designated in the General Plan as FUA #2. FUA #2 was included in the Specific Plan prepared for the Southeast Area of Antioch (August 1982). It was shown in the Plan as Special Planning Area #3. Part of the area was annexed to Antioch in September 1993; annexation of the balance was approved by LAFCo in October 1994, and by the Antioch City Council in January 1995.

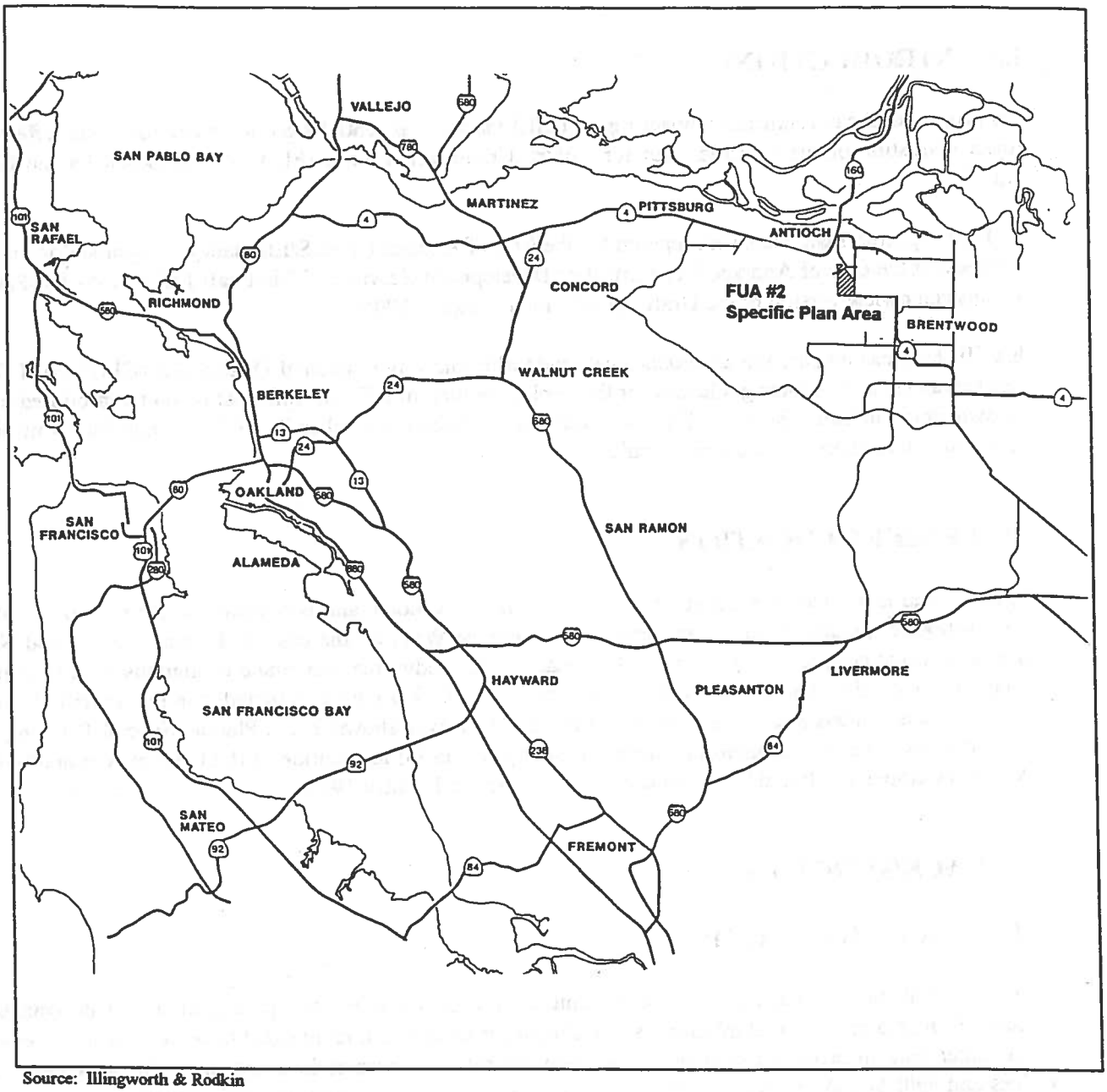
II.C BACKGROUND

II.C.1 Antioch General Plan

The 1988 Antioch *General Plan* update contains policy direction for the project area and designates the Specific Plan area for eventual urban uses. Development in this area is intended to serve as a major employment center with most of the land to be set aside for future suburban business parks incorporating major offices and light industrial uses. The *General Plan* does not provide land use designations for the FUA, but defers that process to the Specific Plan.

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1 FUA #2 occupies approximately the west 1/2 and southeast 1/4 of Section 34, T2N, R2E and the north 1/2 of Section 3, T1N, R2E (Mount Diablo Meridian).



Source: Illingworth & Rodkin

Figure 1

Regional Location

Future Urbanization Area #2 Specific Plan EIR

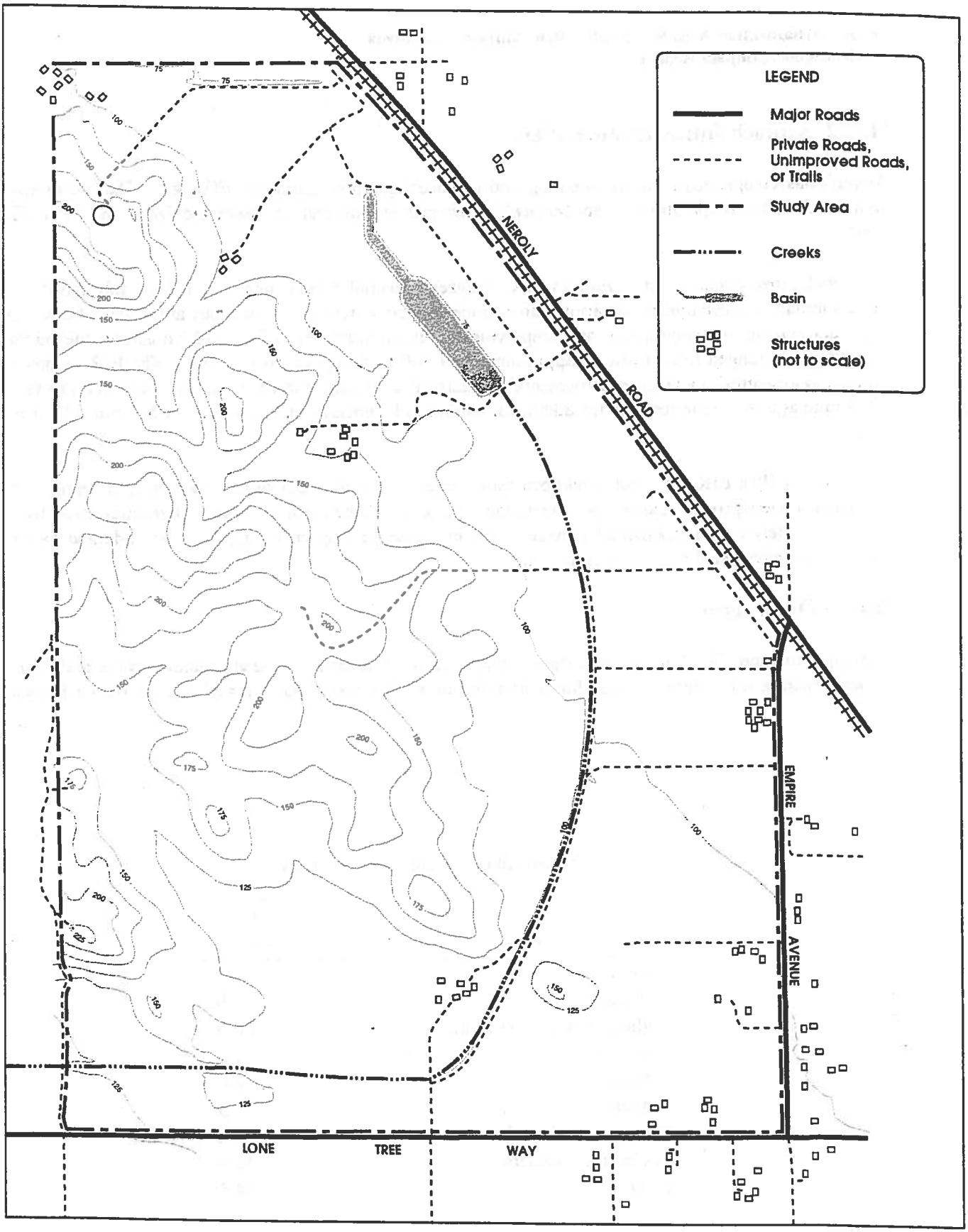


Figure 2

Study Area

Antioch Future Urbanization Area #2

II.C.2 Antioch Infrastructure Plan

Antioch has completed extensive planning and engineering work relating to FUA #2. That previous work culminated in the preparation of the *Antioch Infrastructure Plan* and its associated *Draft* and *Final EIR*s in 1992.

The 1992 *Infrastructure Plan* Program EIR analyzed potential development in FUA #2 through the use of three alternative development scenarios which ranged widely in terms of their types and levels of development (the land acreage for commercial and employment uses ranged from 227 to 313 acres and the number of dwelling units ranged from a low of approximately 1,300 to a high of over 2,600). The EIR recommended mitigation measures to address environmental impacts of development in FUA #2, some of which were procedural mitigations or requirements for additional studies to be undertaken at the time of Specific Plan preparation.

This Specific Plan EIR, a project-level document, represents the third tier of the envisioned planning and environmental review process and will be undertaken both to complete some of those earlier studies and to review more completely the environmental impacts that can be expected given the types, magnitude and location of development envisioned by the Specific Plan.

II.C.3 Ownerships

The approximately 785 acres of the Specific Plan area are divided among eight major owners and four other owners (each of the "other owners" holds no more than 10 acres). The acreage of each owner is shown in Table 1.

Table 1

Ownership of the Specific Plan Area

Owner	Approx. Acreage
Mateas	65.0
R. Jacuzzi	75.6
Rolling Hills/Delizia Ranch	160.9
Nunn	31.3
McBail	252.0
Slatten	35.5
County and Water Districts	146.6
Cranmer and Others	18.5
Total	784.5

Source: McGill-Martin-Self

II.D OVERVIEW OF THE SPECIFIC PLAN PROCESS

The process of preparing and adopting the Specific Plan alternatives evaluated in this EIR has drawn upon all of the planning and environmental analysis for the Specific Plan area undertaken as part of the City's *General Plan* and the *Infrastructure Plan* (described above). The Specific Plan process in particular began with a review of applicable General Plan policies and other city policies intended to guide planning for and development of the Specific Plan area. That review, which is summarized at the end of this chapter and attached to this EIR as Appendix B, was presented to the Planning Commission and City Council in a memorandum from the Deputy Community Development Director dated November 29, 1993.

Based on the earlier work along with updated information and a detailed site analysis, the Specific Plan consultant, ELS/Elbasani & Logan, formulated alternative development scenarios that were reviewed by City staff and participating landowners, and then refined prior to formal presentations to the Planning Commission and City Council in a joint study session (April 17, 1994 and December 7, 1994). The outcome of the planning, consultation, review and refinement process was the definition of a preferred concept plan on which the Specific Plan is based. There have been numerous subsequent study sessions with the Planning Commission, the Development Review Board and the Parks and Recreation Commission.

This EIR analyzes the preferred Specific Plan concept that emerged from the planning process.

A fiscal and financial analysis of the Specific Plan alternatives is presented in a separate document.

II.E THE FUA #2 SPECIFIC PLAN

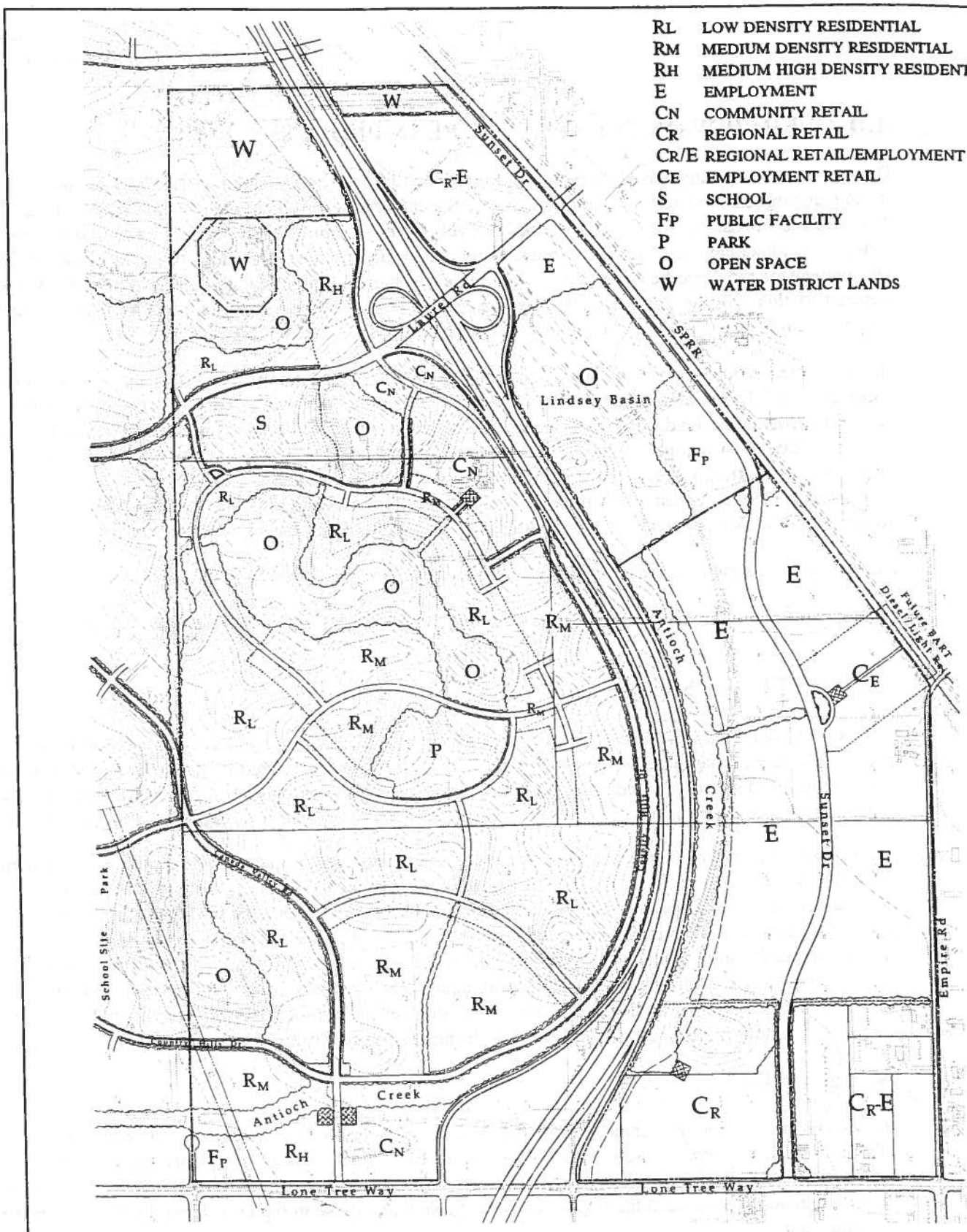
The Specific Plan is the key planning document for the Specific Plan area. It sets forth a vision for the area in terms of land uses, urban design objectives and criteria, infrastructure and public facilities needed to serve new development, open space and landscaping concepts. The plan's implementation program will outline the development approval process, project phasing and financing arrangements for both capital and operating costs.

FUA #2 has several prominent natural physical features and several major existing or planned infrastructure facilities that will shape the Specific Plan. A ridgeline of hills occupies the western portion of the area, running in a generally north-south direction. This ridgeline divides the area into a hilly western half and a relatively flat eastern half. The division is reinforced by the planned State Route 4 Bypass, the proposed route of which traverses the area from north to south along the east side of the ridge, and the planned Contra Costa Water District (CCWD) pipeline, which would parallel the SR 4 Bypass in an 85-foot-wide easement. A realigned and enlarged flood control channel that runs through FUA #2 to a detention basin (the "Lindsey Basin") in the northeast corner of the area will also affect the amount and location of land available for development.

II.E.1 Land Use

Land uses in the preferred Specific Plan alternative considered in this EIR are summarized in Figure 3 and Table 2. Like the alternatives considered in the earlier EIR on the Antioch Infrastructure Plan, the preferred alternative includes a mix of employment, commercial and residential uses along with some public facilities. Differences in acreage between the figures given in Table 2 and those in the Draft Specific Plan are minor and inconsequential.

a. Employment Uses. The Plan contains 122 acres that would allow "employment" uses, which include (by definition) office, light industrial and similar activities. The employment area is located on the relatively flatter portion of FUA #2, east of the hills and the State Route 4 Bypass alignment. Sunset Drive would divide



Source: ELS/Elbasani & Logan

Figure 3

Specific Plan Land Use

Antioch Future Urbanization Area #2 EIR

Table 2

Specific Plan Land Uses

	Approximate Acreage	Housing Units
Residential		
Low Medium Density Residential	137.4	549
Medium Density Residential	91.3	548
Medium High Density Residential	15.0	225
Subtotal	*243.7*	*1,322*
Private Nonresidential		
Employment	122.0	
Community Commercial	24.2	
Employment Center Commercial	11.4	
Regional Commercial	60.9	
Subtotal	*218.5*	
Public/Quasi-Public		
Public Facility	10.8	
School	11.3	
Park	9.4	
Open Space	130.0	
Water District Land	34.5	
Subtotal	*196.0*	
Circulation		
State Route 4 Bypass	83.0	
Arterial and Collector Streets	43.3	
Subtotal	*126.3*	
Total	**784.5**	**1,322**

Source: ELS/Elbasani & Logan

this area into buildable-sized parcels. At buildout, given typical site utilization characteristics, Antioch could expect over 2,000,000 square feet of office/light industrial development in this area. This amount of development would accommodate an estimated 6,000 workers.

b. Community Commercial. A 16.1 acre site, comprised of three parcels at the intersection of Laurel Road and the SR 4 Bypass, is designated for community commercial uses. These uses would typically include shopping centers that offer supermarkets, drug stores, restaurants and similar locally-oriented outlets. A second site, located along Lone Tree Way, would provide another 8.1 acres of community commercial use. Given the number of residences proposed in FUA #2, and the fact that other sites suitable for community retail are also available on Lone Tree Way, it is unlikely that both of these sites would be developed for this use. As required in the General Plan, a feasibility study would be required before community retail could be developed on either site.

c. Employment Center Commercial. An 11.4 acre site on Sunset Drive near the intersection of Empire Avenue and the SPRR tracks is designated for employment center commercial uses. These uses would typically include banks and other financial institutions, professional offices, copy centers convenience retail outlets and restaurants. In general these uses would be "business-oriented".

d. Regional Commercial. The Specific Plan includes 60.9 acres of regional-serving commercial uses, which could be developed with over 500,000 square feet of building space, located at the intersection of the State Route 4 Bypass and Lone Tree Way. These uses are expected to be feasible in FUA #2 because the Bypass will create access to the designated areas not only for Antioch residents but also for residents of newly-developing residential areas in Brentwood and Oakley. The designated sites are configured to work with "big box" retail, but could accommodate a shopping center.

e. Residential Development. A total of up to 1,322 housing units are included in the Specific Plan. Of those, 549 would be low medium density single family homes, built at an average density of four units per acre, and 548 would be medium density single family homes, built at an average density of six units per acre. The remaining 225 units would be medium high density homes, with a maximum density of 15 units per acre.

f. Public Uses.

(1) Schools. A ten-acre elementary school site is provided south of Laurel Road.

(2) Fire Station. A three-acre fire station site is located in the southwest corner of FUA #2. This site would have direct access to a signalized intersection on an arterial (Lone Tree Way).

(3) Other Public Facilities. Contra Costa County owns approximately 11 acres of land in FUA #2 that is designated for public facilities. County staff have indicated that new court and judicial facilities would be developed on this site to serve the east county.

(4) Contra Costa Water District Pipeline. The water district plans to install a major water pipeline from the new Los Vaqueros Reservoir, south of FUA #2, to the canal and pumping station located in the northwesterly portion of FUA #2.

g. Parks. Antioch's General Plan requires five acres of parks for every 1,000 residents. Based on the number of housing units allowed by the proposed Specific Plan (1,322 units), FUA #2 would generate the need for 20 acres of park land. These parks would be provided as follows:

- A park of approximately 9 acres located at the southerly end of the open space spine. This location allows easy access to the East Antioch Creek Trail System. It also provides adequate separation (3/4 mile) from the Meadow Creek Park. The location of this park is approximate, and could shift slightly to allow a different distribution between properties.

- Active recreation facilities, such as soccer and baseball fields, that could be located in Lindsey Basin. This land is owned by the Flood Control District and could be improved by the City through park in-lieu fees and other sources. The City and the District are supportive of the concept of joint use, as long as maintenance costs are kept to a reasonable level.

h. Open Space. The ridgeline of hills that runs generally in a north-south direction through the western portion of FUA #2 would be preserved as a public view trail. Some modest planting, such as Coast Live

Oaks in the swales, may be undertaken to restore and enhance the natural look of these heavily grazed hills. Otherwise, however, aside from the trail itself, this open space would remain largely unimproved. Figure 4 shows the proposed open space system.

In addition to the hills, FUA #2 has a second major open space element in Antioch Creek. The creek, which is part of a system that drains the majority of Antioch, enters FUA #2 from the west near Lone Tree Way, and continues eastward, turning north along the State Route 4 Bypass route between the bypass and the Contra Costa Water District pipeline. The creek area will be improved in accordance with the City's Creek Policy, which primarily involves planting the channel with riparian vegetation and the installation of a trail system. The creek trail will connect with the existing creek trail system to the west (in the Sand Creek Specific Plan Area). The channel cross section will be wider through FUA #2 than it is west of the area, to allow for more vegetation than exists to the west. (See "*Drainage*" section below, for more detail about the creek.)

Finally, the Plan shows an open space area between the State Route 4 Bypass and the proposed collector road that parallels the west side of the Bypass. This area is primarily a downslope created by the construction of the Bypass. The design and landscape treatment of this area will be important, given its high visibility from the Bypass. Sound attenuation for the residential units to the west will also need to be addressed in this area.

i. Circulation. The State Route 4 Bypass is the dominant roadway improvement in FUA #2. The road right-of-way would occupy a breadth of 250 feet, with a capacity of up to eight lanes of travel and the future possibility of a rail line. Two interchanges are planned: one at Laurel Road and one at Lone Tree Way. Timing of construction is uncertain, but would likely commence by the end of 2005. Initially, the road would consist of four lanes, with at-grade crossings at Laurel and Lone Tree. The grade-separated interchanges would follow when funding allows.

Lone Tree Way would be widened to six lanes west of the Bypass and four lanes east of the Bypass. Laurel Road would be extended to a four-lane arterial, and would connect over the railroad tracks to Laurel Road in Oakley.

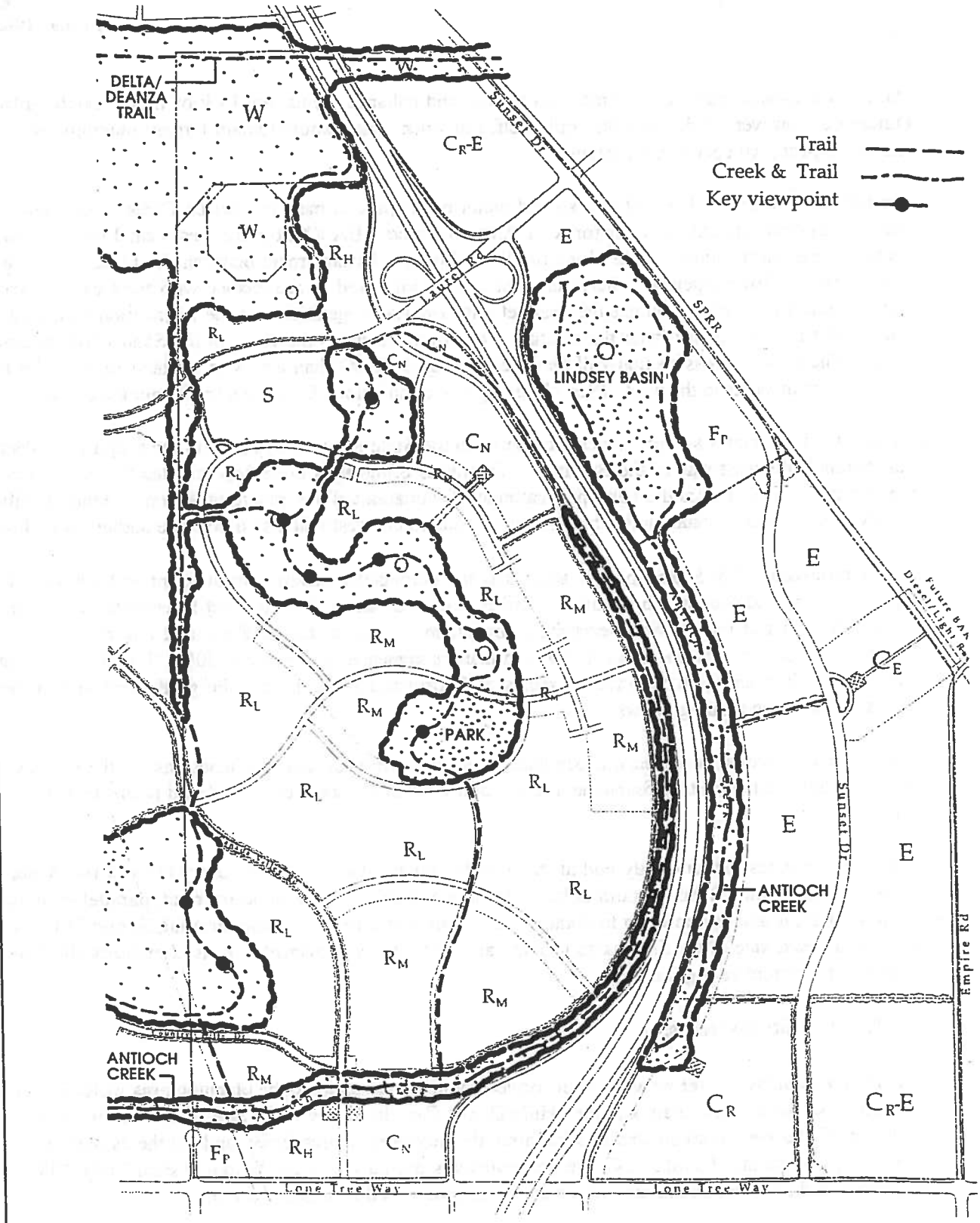
The collector roads that currently end at the west boundary of FUA #2 – Country Hills Drive, Vista Grande Drive, Canada Valley Road – would be extended into FUA #2. A new collector road, parallel to the west side of the Bypass, is also proposed to facilitate north-south traffic flow. Another arterial, Sunset Drive, would be built on the east side of the Bypass to provide access to the employment parcels. Empire Road would likely remain in its current configuration.

j. Major Utility Systems.

(1) Water supply. Water network improvements anticipated to serve the planning area include: (1) pipeline extensions within Laurel Road, Country Hills Drive, Canada Valley Road and Lone Tree Way; (2) the construction of a new north-south water main within the proposed Sunset Drive; and (3) the expansion of existing and new pump station facilities. These improvements are based on the Water System Master Plan[2] which addresses land uses and unit counts which are consistent with the proposed project.

Water supply source and treatment plant capacity issues are addressed in the *Infrastructure* section of

2 Water System Master Plan Update for the City of Antioch (Brown and Caldwell Consultants, July 1991).



Source: ELS/Elbasani & Logan

Figure 4

Open Space System

0 500 1000 2000

Antioch Future Urbanization Area #2 EIR

Chapter III. Based on planning studies,[3] it appears that future water demands associated with the development of FUA #2 can be met.

(2) Wastewater Disposal and Treatment. A major trunk sewer line serving the Southeast Area is proposed to run through FUA #2. This line will run down Lone Tree Way, up Empire Road, and then north along the west side of the railroad tracks. The trunk line, which is being sized to handle FUA #2 development, is likely to be under construction in 1996.

(3) Drainage. Storm water would be handled by East Antioch Creek. The existing, temporary channel would be relocated and widened. In its ultimate configuration, the channel will parallel Lone Tree Way, cross under the Highway 4 Bypass, and run north between the Bypass and the CCWD pipeline.

The channel cross section would be 140 to 180 feet wide in FUA #2. This width is significantly greater than the upstream portion of the channel (located in the Southeast Area), which has a width of approximately 110 feet as it flows through the Meadow Creek property (Seeno). The additional width will allow for more vegetation and a more natural-looking creek. Bicycle/pedestrian paths will be incorporated along the channel.

(4) Other Utilities. Each utility serving the planning area (PG&E, Pacific Bell and Viacom) will expand their lines, cables and facilities as necessary.

II.E.2 Open Space and Landscaping

A variety of formal and natural open spaces are planned to serve FUA #2 including ridgetop trails and open space, trails and open space along Antioch Creek, the Lindsey Basin Recreation Area, a neighborhood park and an elementary school. These open spaces will provide the community with both active and passive recreation opportunities as well as pedestrian and bicycle access between open space areas.

Ridgetop trails and open space will serve both as geographic reference points that help define the character of individual districts and as limited recreational resources, providing hiking and viewing opportunities. Open space and trails adjacent to Antioch Creek will accommodate pedestrians and bicyclists as well as compact recreational activities such as picnicking. Additionally, open space along the creek will sustain habitats for wetland species. Lindsey Basin Recreation Area is being considered as an active recreation area with turf playfields, hardcourts and after-dark lighting to serve primarily adolescents and adults. The neighborhood park envisioned for FUA #2 will be approximately 9 acres and serve as an active recreation facility and south-end trailhead for the Ridgetop Trail. Lastly, an elementary school planned for FUA #2 will provide both students and the community with active recreational amenities including hardcourts and playfields.

II.E.3 Urban Design

The urban design concept envisioned for the FUA #2 Specific Plan considers the following community attributes: open space, the Route 4 Bypass, streets, employment centers and residential areas.

In an effort to provide diverse outdoor experiences, open spaces in FUA #2 have been designed around a contiguous system of formal and natural open spaces, including active parks and playfields as well as trails along

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3 East County Water Supply Management Study Phase 1 - Supply and Demand (Contra Costa Water District, January 5, 1994).

the creek and central ridge. Additionally, areas adjacent to the Route 4 Bypass will be improved with trees, creating a parkway setting with open space buffer areas.

Besides places to enjoy the outdoors, the Specific Plan for FUA #2 will also provide places to live and work. An employment center is envisioned for FUA #2 as a campus-like environment with a mix of large and small employers. At the center of the employment center, a retail cluster will complement employment uses with restaurants and other services. Retail and service-oriented uses are also planned as part of the residential community west of the Bypass. Comprised of both single and multi-family units, the residential component of FUA #2 will be developed according to design standards that not only address the quality of design and materials, but also variations in form and style, preservation of views and key natural landforms, and the creation of secure, pedestrian-friendly streets that emphasize community identity and sense of place.

II.F ACTIONS AND APPROVALS REQUIRED

Together with the EIR prepared for the Antioch Infrastructure Plan, this project-level EIR covers the following actions:

- ❒ Completion of surveys for preliminary delineation of jurisdictional wetlands (if any); Amendment of Antioch General Plan;
- ❒ Adoption of Specific Plan;
- ❒ Construction of capital improvements to serve planned FUA development in conformance with the Specific Plans;
- ❒ Other City land use approvals and development permits consistent with the Specific Plans;
- ❒ Possible general or individual permit(s) from U.S. Army Corps of Engineers for activities involving dredging or fill within waters of the U.S.; and
- ❒ Streambed alteration permit(s) from the California Department of Fish and Game.

II.G CONSISTENCY WITH PUBLIC PLANS AND POLICIES

II.G.1 City of Antioch

The policy paper presented to the Planning Commission and City Council on December 7, 1993 summarized policies intended to guide the development of the Specific Plan area that are contained in the following City documents:

- ❒ Antioch General Plan, adopted December 1988.
- ❒ Environmental Impact Report on the Antioch General Plan, September 1988.
- ❒ Opportunities and Constraints Report, FUAs # 1 and 2, October 7, 1991.
- ❒ Housing Element, Antioch General Plan, adopted October 27, 1992.
- ❒ Creek Development Policy, Resolution No. 92/237, October 27, 1992.

- ❒ Memorandum of Understanding Concerning Boundary/Open Space between the Cities of Antioch and Brentwood, October 27, 1992.
- ❒ Tree Ordinance, Draft #3, September 17, 1992.
- ❒ Annexation Agreements for FUA #2 approved by the Antioch City Council on November 9, 1993 and January 10, 1995.
- ❒ Staff Report to the Antioch City Council for Consideration at the Council Meeting of September 14, 1993.

A memorandum from the City Manager to the City Council and Planning Commission (December 27, 1993) summarized the key policies contained in these documents that would apply to the development of the Specific Plan area as follows:

- ❒ Development will focus on employment use: FUA #2 is intended to be developed as a major employment center for East Contra Costa County. Premature urbanization is to be avoided, since it could result in suboptimal development.
- ❒ The majority of FUA #2 should be in suburban-type business parks. These facilities would be located on the flatland areas of the FUA. Major office and light industrial uses are to be developed in accordance with high standards of design and should project an image of quality.
- ❒ The hills are more suitable for residential use.
- ❒ Residential development will include a variety of types, including multi-family and affordable housing.
- ❒ The City is to show flexibility in design and development standards in order to encourage the desired types of development within the physical framework of the FUA. However, residential development in FUA #2 must be sited and designed to protect residents from potential noise and air quality impacts of major transportation facilities.
- ❒ Development will reflect land contours and natural features (creeks and drainages, vegetation, views). The land use plan should reflect City policy with regard to hillside development, protection of views and creek preservation.
- ❒ FUA #2 may have sites suitable for retail use. However, the City should avoid retail "overbuilding." Periodic re-evaluation of commercial development needs should be undertaken.
- ❒ New residential development shall support its own service costs, both capital and operating.

The entire policy paper, which cites specific references for the policies presented, is included in this EIR as Appendix B.

II.G.2 Other Plans

a. County of Contra Costa. The Contra Costa County General Plan implements County voters' approval of a 1990 ballot measures (Measure C-1990) that established a 65/35 Land Preservation Standard. This standard limits urban development in the County through at least the time horizon of the County General Plan. It restricts development to no more than 35 percent of the land in the County, irrespective of future County General Plan amendments, and preserves at least 65 percent of land in the County for agriculture, open space, wetlands, parks and other non-urban uses.

The County's Urban Limit Line (ULL) is located approximately 7,000 feet (1.3 miles) east of the eastern boundary of FUA #2 and 9,200 feet (1.75 miles) southeast of the southeastern corner of the FUA. (See Figure 16, p. 55 of the *Infrastructure Plan EIR* .) All of FUA #2 lies on the 35 percent side of the ULL, meaning that it may be considered by local government for urban development.

b. Public Service Agencies. Agencies that would provide services to support site development include the Contra Costa Water District, the Delta-Diablo Sanitation District, the Contra Costa County Flood Control District, the Central Contra Costa County Consolidated Fire District, the Antioch Unified School District, the Brentwood Union Elementary School District and the Liberty Union High School District. Input from these agencies was solicited through the NOP process. Consistency of the proposed specific plan with applicable plans and policies of these agencies is addressed in the topical discussions of Chapter III.H Public Services and Chapter III.I Infrastructure.

c. Regional Planning. The Bay Area Air Quality Management District (BAAQMD) undertakes air quality planning for the region in implementation of the Clean Air Act. Consistency with BAAQMD planning and other requirements is addressed in Chapter III.C Air Quality.

The East Bay Regional Park District (EBRPD), which manages extensive lands throughout Contra Costa and Alameda County, plans for the long-term acquisition and administration of regional open space resources. The closest EBRPD site to FUA #2 is the Black Diamond Mines Regional Preserve immediately to the west of FUA #1. Development allowed under the proposed specific plan is too remote from the Preserve to present the possibility of a direct impact.

d. Brentwood/Antioch Memorandum of Understanding. In October of 1992, the cities of Antioch and Brentwood entered into an agreement with the purpose of resolving boundary questions between the two cities and implementing an open space buffer between them. The key requirement of the agreement states: "Neither City shall file a Sphere of Influence or Annexation application for any area within the designated boundary line of the other City, as shown in Exhibit #1". The exhibit shows the sphere of influence boundary between the two cities. The annexation of FUA #2 to the City of Antioch (November, 1993 and January, 1995 is consistent with the agreement.

e. Compliance with Measure C Traffic Service Objectives. Routes of Regional Significance are adopted by each jurisdiction in Contra Costa County as part of the Measure C Growth Management Program and are designated by each of the Regional Transportation Planning Committees (RTPCs) in the four subareas of Contra Costa County (in eastern Contra Costa County, TRANSPLAN). These routes are exempted from basic route level of service standards. Instead, other measures, Traffic Service Objectives (TSOs), were approved by TRANSPLAN in May 1995 (Resolution 95-1) and the Transportation Authority approved the Countywide Plan (including the East County Plan) in July 1995. Resolution 95-1 amends the current TSO standards proposed for adoption in December 1994.

This report has evaluated Regional Routes using both sets of TSO standards. The previous TSO standards are summarized in Chapter III (pp. 30-32). The new TSO standards differ significantly from the previous standards. They are based on "Delay Index" and "Vehicle Occupancy" criteria as described in detail in Chapter III.

CHAPTER III

ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

III.A LAND USE[4]

III.A.1 Setting

Future Urbanization Area #2 (FUA #2) is comprised of 785 acres of rangeland, croplands and orchards located within low rolling foothills of the eastern side of Mt. Diablo. It forms the eastern edge of the City of Antioch. Land to the east and south is in unincorporated Contra Costa County. The area to the east is within the planning areas of Oakley and the City of Brentwood; land to the south is with Brentwood's planning area.

a. Current Land Uses on the Site. The terrain of FUA #2 consists of gently sloping hills, the minimum and maximum elevations of which are approximately 75 feet and 249 feet respectively. Land uses within FUA #2 are almost entirely agricultural, with a few farm residences in the southwest corner of the area. The flat plain in the eastern portion is used for orchards and row crops, while the hills in the western portion are used for grazing and hay production. Figure 5 is an aerial view of FUA #2.

An operations center and storage tanks for the Oakley and Contra Costa Water Districts are located at the northwest corner of the site. A PG&E pipeline easement traverses the western border of FUA #2.

Antioch Creek, an improved flood control channel, enters FUA #2 in the southwest and runs east approximately halfway through the area. It then turns northward on the east side of the hills, and empties into a detention basin ("Lindsey Basin") at the northeast corner. Presently, Lindsey Basin covers about five acres of land. The county has plans to relocate Antioch Creek and enlarge Lindsey Basin to accommodate runoff from a 100-year flood (see *Flooding and Drainage* section below, p. 106).

b. Current Land Uses Adjacent to the Site. Lands to the west and north of FUA #2 are within the City of Antioch. The Antioch General Plan designates these areas for low (up to four units per acre) and medium-low (up to six units per acre) density residences. Approved residential subdivisions, some of which have been completed and some of which are under construction, abut the entire western border of the area. Amid these subdivisions are two open space reserves, situated along the edge of FUA #2.

Lands to the south and east of FUA #2 are in the unincorporated portion of Contra Costa County. The County General Plan designates most of the land south of the area for agricultural use. Parcels around the southeast corner of FUA #2 are assigned to the residential (very low density: less than one unit per acre) land use category. Lands adjacent to the remaining portion of the eastern border of FUA #2 are designated for residential use ranging in density from low (1.0 to 2.9 units per acre) to high (5.0 to 7.2 units per acre) single family homes. Figure 6 shows City and County General Plan designations.

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4 Background information, analysis of impacts, and recommendation of mitigation measures for the *Land Use* section have been prepared by Mundie & Associates.

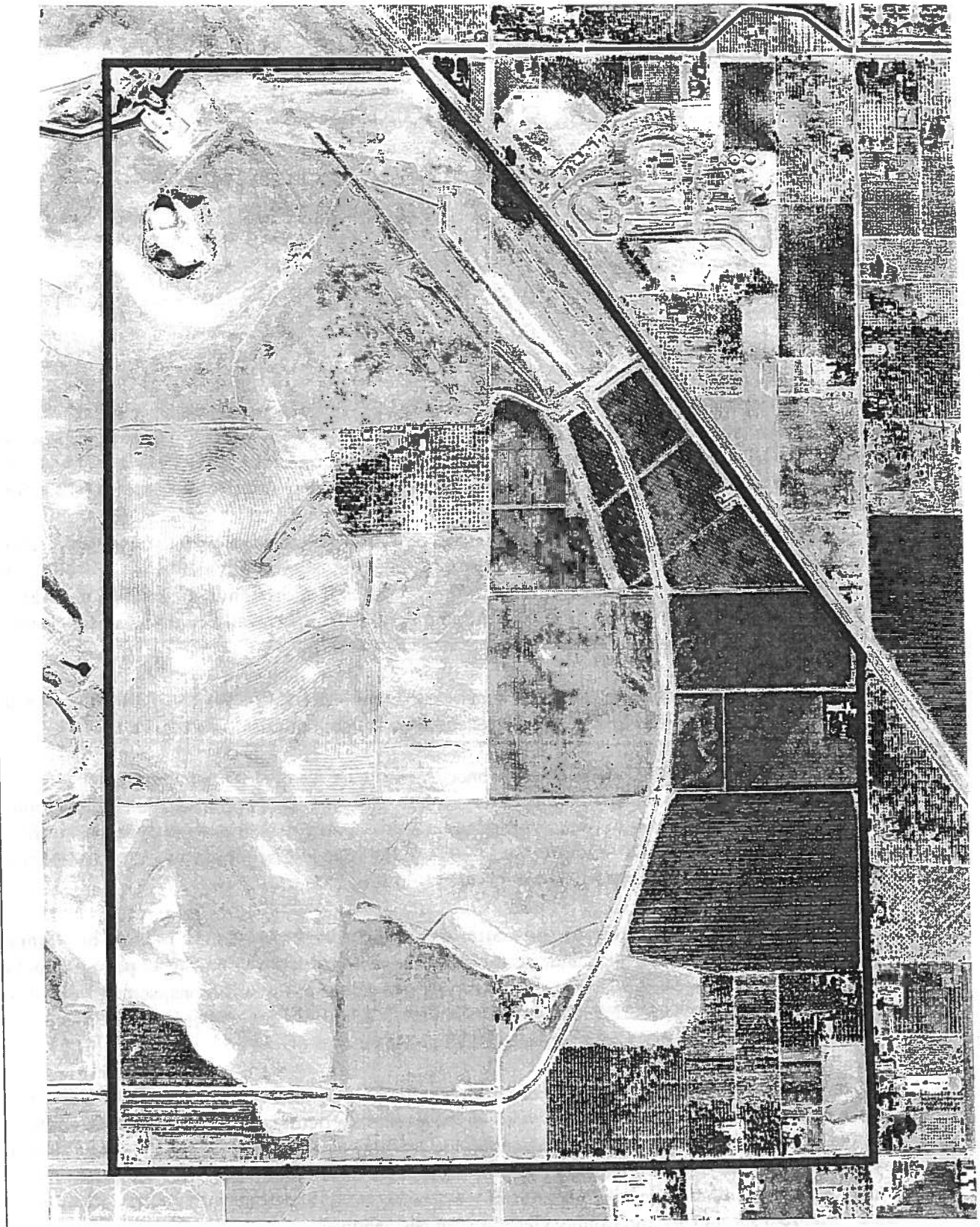


Figure 5

Aerial Photograph

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Antioch Future Urbanization Area #2

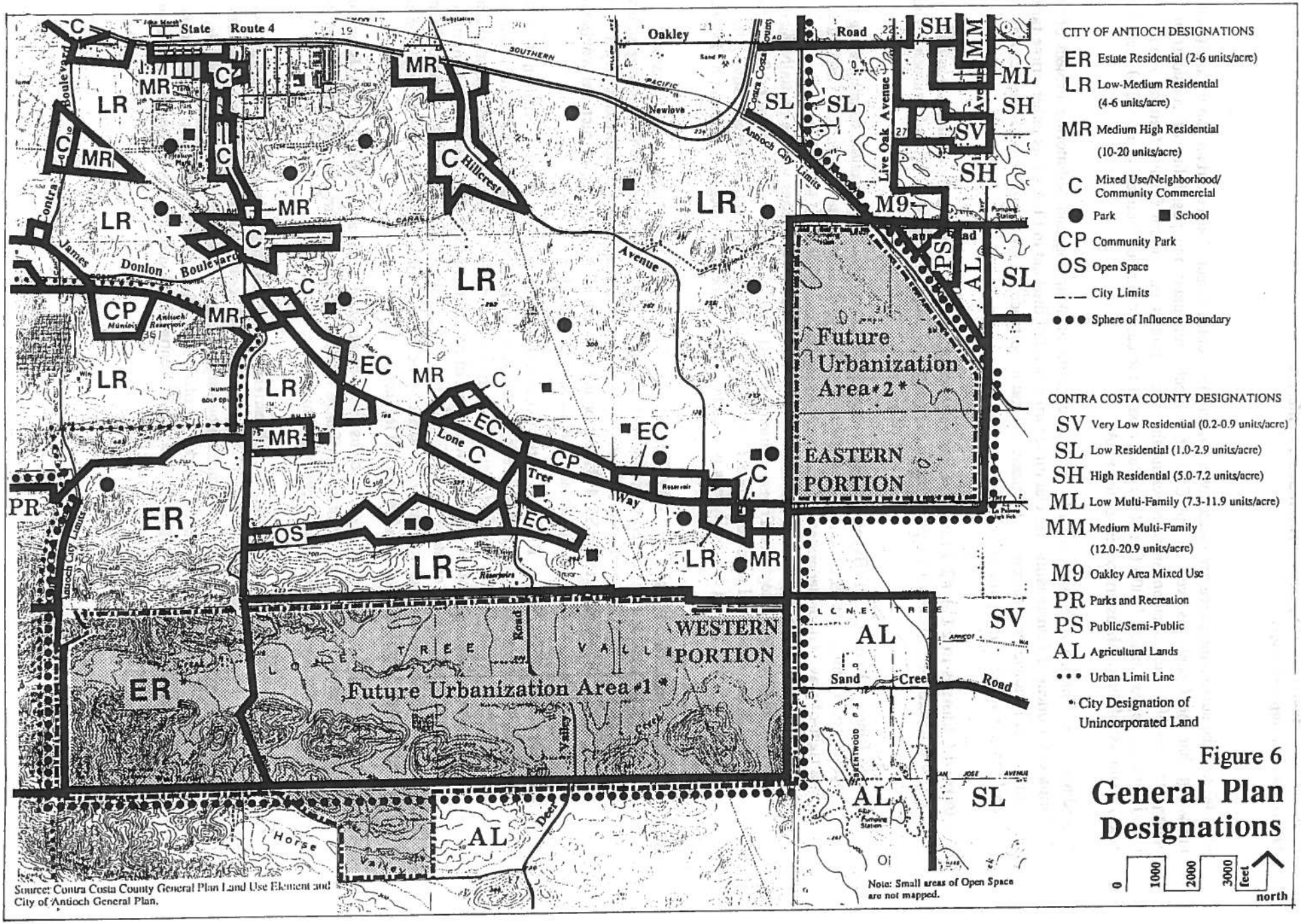


Figure 6

General Plan Designations

FUA #2 and the surrounding area are located well within the Contra Costa County Urban Limit Line (ULL), indicating that the County as well as the City of Antioch anticipates the possibility of considering the appropriateness of urban development there within the time frame of the current County General Plan. The ULL is located approximately 7,000 feet (1.3 miles) east of the eastern project boundary and 9,200 feet (1.75 miles) southeast of the southeastern corner of the FUA.

According to the *Antioch Infrastructure Plan* EIR, the Farmland Mapping and Monitoring Project of the California Department of Conservation has classified virtually all of the land in FUA #2 as either prime farmland, farmland of statewide significance or farmland of local importance (*Draft Environmental Impact Report, Antioch Infrastructure Plan*, Figure 15, p. 53).

c. Planned Changes in FUA #2 Land Use without the Project. Several projects located in FUA #2 could proceed regardless of whether a Specific Plan for FUA #2 is approved by the City of Antioch. They include:

- **State Route 4 Bypass.** The Bypass would cross FUA #2 in a north-south direction, running along the east side of the hills. At its ultimate configuration, it would be an eight-lane expressway within a 250 foot right-of-way. Grade-separated interchanges would be located at Laurel Road (assuming extension of Laurel through FUA #2) and Lone Tree Way. Construction of the Bypass will be partially funded by the recently adopted Regional Transportation Fee. At first, the road would consist of four lanes with at-grade crossings at Laurel and Lone Tree. The interchanges would follow when funding allows. The timing of construction for the Bypass is uncertain, but is expected to begin by the end of 1999 at the earliest.
- **Contra Costa Water District (CCWD) Pipeline.** The water district plans to install a major water pipeline from the new Los Vaqueros Reservoir, south of FUA #2, to the canal and pumping station located in the northwesterly portion of FUA #2. The pipeline easement would be approximately 85 feet wide and would run parallel to the SR 4 Bypass on the east side of the roadway. Structures would not be permitted on the easement, but parking would be an acceptable use.
- **Antioch Creek and Lindsey Basin.** Contra Costa County has prepared plans to realign Antioch Creek and to increase the capacity of the creek and Lindsey Basin. The widened creek would occupy a right-of-way of approximately 180 feet, adjacent to the proposed SR 4 Bypass. Under typical conditions, the creek would require only a low-flow channel of five feet in width. The channel could meander through the right-of-way to create a "natural" look, and the remainder of the creekway could be landscaped and utilized for paths, trails and open space. The enlarged basin would include playfields with lights for after-dark uses (such as adult softball leagues).
- **County Facilities.** Contra Costa County owns approximately 11 acres adjacent to Lindsey Basin, in the northeastern part of FUA #2. County staff have indicated that new court and judicial facilities, to serve east County residents, will be developed on this site.

d. Future Land Use Context: Expected Development in the Surrounding Area. Land immediately west of FUA #2, as noted above, is in the City of Antioch and is completely occupied by approved residential subdivisions. These subdivisions are dominated by single family homes, built at an average density of 3 to 4 units per acre. South of Lone Tree Way and west of FUA #2, land that is currently undeveloped has been designated by the Southeast Area Specific Plan for residential development, with supporting neighborhood commercial and some public/institutional uses.

The City of Brentwood adopted its current General Plan in 1993, showing land use designations as far north and west as FUA #2. The General Plan land use map shows Professional Office uses along most of the south side of Lone Tree Way, with a neighborhood commercial retail center on Lone Tree Way at Empire Avenue. Land on the east side of Empire Avenue between Lone Tree Way and the Southern Pacific Railroad is designated as Special Planning Area "F". This 98-acre site is described in the Brentwood General Plan as intended for employment use, in a 50/50 mix of industrial and commercial uses to complement the employment uses that develop on the Antioch land to the west. Land southeast of the Lone Tree Way/Empire Avenue intersection is designated for low density residential use (1.1 to 5.0 units per acre).

e. Jobs/Housing Balance in Antioch. The Association of Bay Area Governments (ABAG, *Projections '94*) estimates that Antioch (including the city's sphere of influence) had 12,640 jobs and 21,729 households in 1990. Using households as a surrogate for housing units, these figures indicate a jobs/housing balance of 0.6 to 1 in Antioch; that is, 0.6 jobs per housing unit. This ratio is lower than the balance for Contra Costa County as a whole (1 to 1.26) and for neighboring Brentwood (including the city's sphere of influence; also 1 to 1), but higher than for the surrounding rural east county area (0.2 to 1).

ABAG projects that both the number of jobs and the number of housing units in the East County will rise by the year 2000. The jobs/housing balances in that year, based on the *Projections '94* figures, will be in Antioch, the county and Brentwood, reflecting losses of jobs during the recession. Antioch's jobs/housing balance (again, estimated based on households rather than actual units) is estimated at 0.54 to 1, Brentwood's at 0.86 to 1, and the county's at 0.95 to 1 and as well.

III.A.2 Impacts

a. Onsite Change in Land Uses. The FUA #2 Specific Plan would permit the conversion of land currently in agricultural use to urban uses, including up to 1,322 housing units, 122.0 acres of employment uses, 96.5 acres of commercial uses, an elementary school on 11.3 acres and parks on approximately 9 acres. An estimated 126.3 acres would be occupied by the State Route 4 Bypass (83.0 acres) and other major roadways (43.3 acres).

Conversion of land within a city from non-urban to urban uses is not in itself considered an adverse environmental impact. Nevertheless, it is useful to gain an understanding of the magnitude of the change that would be permitted by comparing the permitted uses to existing development in Antioch:

- In 1994, the City of Antioch had an estimated 22,973 housing units. The addition of 1,322 new units would increase the city's housing stock by 5.8 percent.
- When the General Plan was updated in 1988, Antioch had an estimated 97.8 acres of land in office and light industrial uses within its Sphere of Influence (SOI). The addition of 122 acres of employment land in FUA #2 would increase this amount by 124.7 percent.
- When the General Plan was updated, Antioch had an estimated 239.2 acres of commercial development within its SOI. The 96.5 acres included in the Specific Plan would increase that amount by 40.3 percent.

The creation of the proposed specific plan for the entire 785-acre planning area allows more comprehensive consideration of the potential for internal land use conflicts than would otherwise be the case with a series of

individual development proposals. The geography of the planning area accommodates a range and variety of uses while providing built-in barriers to conflict among uses. For example, the location of Lindsey Basin (across the Bypass right-of-way from residential and commercial uses and adjacent to employment uses) and its topography (depressed below the average grade of nearby parcels) would allow it to be used for nighttime recreational activities such as adult softball leagues without interfering with the quieter uses. Likewise, the right-of-way for Antioch Creek can be used as a buffer between the SR 4 Bypass and uses that would otherwise suffer adverse impacts of close proximity to the noise, air quality and visual impacts of such roadway.

b. Onsite Jobs/Housing Balance. The Antioch General Plan and other city policy documents direct that FUA #2 be developed as an employment center for eastern Contra Costa County, with a jobs/housing balance exceeding 1 to 1.

The proposed Specific Plan would accommodate an estimated 6,000 employees in the areas designated for employment uses,[5] and another 2,335 workers in the areas designated for retail use[6], for a total of 8,335 workers. (Some additional jobs may be accommodated in the County facilities and in private households, but their numbers would be small compared to this conventional employment base.) This employment base would equal 6.3 jobs per housing unit in FUA #2, assuming that all 1,322 units permitted by the Plan are eventually constructed.

c. Impacts on Adjacent Land Uses. No adverse impacts on adjacent land uses would result from development allowed under the proposed plan. The primarily residential subdivisions located to the west and north of the planning area would blend with the proposed uses of FUA #2. Existing open space reserves situated along the western edge of the planning would tie in with open space planned for FUA #2. Lands south and east of FUA #2 are within the County's ULL and are designated either for professional office or neighborhood commercial uses. Lands north and east of FUA #2 would be physically separated from the employment and public facilities uses shown in the proposed specific plan by the SPRR tracks. As noted above, this area is referred to as Special Planning Area "F" in the Brentwood General Plan and calls for a mix of industrial and commercial uses which would be complementary with the planned FUA #2 uses.

No significant land use impacts would result from development allowed by the proposed plan.

III.A.3 Mitigation Measures

No adverse impacts on land uses have been identified. Therefore no land use mitigation measures are required.

5 Estimated by the Deputy Community Development Director, based on typical site utilization characteristics.
6 Estimate based on 25 percent building coverage and one worker per 450 square feet of building space.

III.B TRANSPORTATION [7]

III.B.1 Setting

a. Local Access. Described below are key roads that would serve the study area. The location of these roads and the estimated existing peak hour traffic volumes, by direction, are shown in Figure 7.

Hillcrest Avenue extends south from east 18th Street in a north to south direction approximately 2.5 miles. It is two lanes in each direction south of Davison Road, and three lanes in each direction from Davison to Tregallas Road. From Tregallas to east 18th Street, Hillcrest Avenue has only one through lane in each direction, with a two-way turn lane. South of Lone Tree Way, Hillcrest Avenue has been built for 0.7 miles. Conditions are currently acceptable along most of Hillcrest Avenue, except for significant peak period congestion at the SR 4 on- and off-ramps.

Lone Tree Way extends south from SR 4, then extends east to connect with the non-freeway portion of SR 4 in Brentwood. From the freeway south to James Donlon Boulevard, Lone Tree Way is two lanes in each direction with traffic signals and commercial development. There is occasional congestion.

South and east of James Donlon Boulevard to Hillcrest Avenue, Lone Tree Way is four-lane divided roadway with free flow traffic. This portion of Lone Tree Way has some limited access from side street traffic.

EXECUTIVE SUMMARY
TRANSPORTATION

This traffic analysis was conducted in conformance with Measure C requirements. Basic Routes and Regional Routes were evaluated. Six Basic Route intersections were analyzed. Sunset Dr./Laurel Rd. and Sunset Dr./ Wild Horse Rd. would be significantly impacted by the project in the Near Term. No Basic Route study intersections would be significantly impacted by the project in the Long Term (Recent Trends). The adopted Traffic Service Objectives would not be violated for any of the Regional Routes analyzed.

Most study intersections and roadways currently operate at acceptable conditions in both peak hours. Intersections at SR 4/Hillcrest Ave., SR 4 (non-freeway/Lone Tree Way and Empire Avenue/Lone Tree Way) currently experience deficient peak hour conditions on at least one movement. The SR 4 freeway at Willow Pass Grade summit and Vasco Rd. both currently experience severe congestion during peak hours.

The project would have significant impacts at seven intersections in the Near Term (Phase I) and 11 intersections in the Long Term (Recent Trends). These can all be mitigated to a less-than-significant level.

East of Hillcrest Avenue to SR 4, Lone Tree Way narrows to a rural, two-lane road, with a posted speed limit of 50 mph. There is generally no congestion on this portion of the route.

Empire Avenue is a rural, two lane road with uncongested conditions that extends from Lone Tree Way north across the SPTCo. tracks to an intersection with Oakley Road near SR 4.

Laurel Road is currently a discontinuous roadway with an eastern portion (east of the proposed project) that extends from Empire Avenue to just east of SR 4 as a two-lane road. The western portion (west of the proposed project) extends from Hillcrest Avenue to Canada Valley Road.

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7 Background information, analysis of impacts, recommendation of mitigation measures and draft graphics for the *Transportation* section have been prepared by DKS Associates.

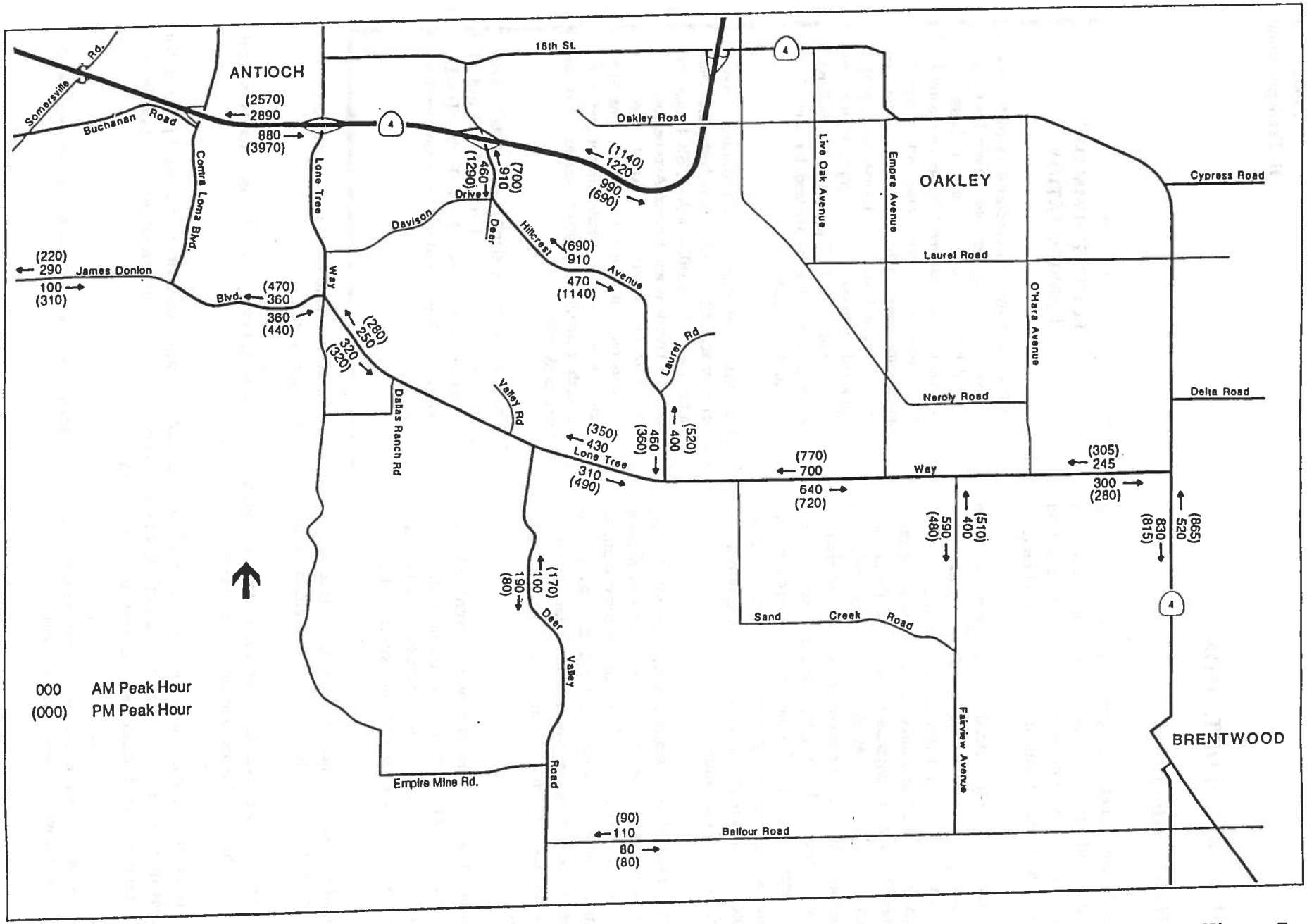


Figure 7

Source: DKS Associates

Traffic Volumes Existing Conditions (1990-93)

Future Urbanization Area #2 Specific Plan EIR

Deer Valley Road extends from Marsh Creek Road in the south to Hillcrest Avenue. South of the proposed project, it is a rural, two-lane highway with low traffic volumes. From south of Lone Tree Way to Hillcrest Avenue, it is a four-lane suburban arterial street.

James Donlon Boulevard is a primarily four-lane street that extends from Lone Tree Way west to Somersville Road, although the western portion of the road is still two lanes. This street serves as a bypass of the SR 4 freeway for east-west traffic to and from southeast Antioch.

Dallas Ranch Road is a rural, two lane road with uncongested conditions that runs north/south south of Lone Tree Way.

b. Regional Access. Regional access to the study area is provided by the following facilities.

State Route 4 (SR 4) is a four-lane facility that provides the only freeway access to the study area. SR 4 runs in an east/west direction three miles north of the site, providing a link with the City of Pittsburg to the west and then turns north to link with communities in the Sacramento River Delta area. During peak periods, it experiences severe congestion from I-680, over the Willow Pass Grade to Antioch.

Vasco Road is a winding rural, two-lane highway that extends from Camino Diablo south of Brentwood to I-580 in Livermore. It is the only access from the project area south to Livermore and the Tri-Valley area. Congestion is experienced during peak periods.

Byron Highway is a regional, two-lane highway that provides access east to Tracy where it connects with I-205.

Marsh Creek Road provides access to Clayton, Concord and Walnut Creek. It is a rural, winding, two-lane road that is generally uncongested. It ends at Clayton Road in the City of Clayton.

Kirker Pass Road is a four-lane divided highway that extends from Railroad Avenue in Pittsburg over Kirker Pass to Concord.

c. Transit Service. Transit service in the area is provided by the Eastern Contra Costa Transit Authority (Tri Delta Transit), which has recently started service to southeast Antioch. BART provides express bus service to the Concord station from a park-and-ride lot at the Hillcrest Ave./SR 4 interchange.

d. Traffic Levels of Service - Local Study Area. In order to evaluate current study area conditions during the peak periods, vehicle turning movement counts were taken and field observations were made at key intersections (see Figure 7, p. 22) Traffic counts were taken at the existing intersections in December 1993 or April 1994 on a Tuesday, Wednesday or Thursday of a non-holiday week. Mid-week data were used for traffic counts to represent typical conditions.

The intersection level of service was calculated for each selected location. Signalized intersections were evaluated using the critical movements Planning Method of Circular 212 as modified by the Contra Costa Transportation Authority in its Technical Procedures.[8, 9] The Contra Costa Transportation Authority

8 *Transportation Research Circular 212*, Transportation Research Board, 1980.
9 *Technical Procedures*, Contra Costa Transportation Authority, 1991.

(CCTA) requires that the UCCC analysis program be used for signalized intersections. The primary criteria used to describe operating conditions at signalized intersections are the volume-to-capacity (V/C) ratio and the average delay for vehicles. Intersection service levels, ranging from level of service (LOS) A (free flow) to LOS F (gridlock condition), denote the relationship between an intersection's peak hour volume and its physical capacity to accommodate vehicles (see Table 3, p. 25). The City of Antioch General Plan considers LOS D (V/C ratio of 0.89) or better at individual intersections to be acceptable during peak traffic periods on local roadways in Southeast Antioch.

Unsignalized intersections were analyzed using the methodology of the *Highway Capacity Manual*.[10] At these intersections, each turning movement that yields to an opposing movement is evaluated separately and assigned a level of service grade. The level of service is based on the relative ability of yielding traffic movements to find adequate gaps in the opposing traffic flows. Table 4 (p. 25) shows the level of service definitions for unsignalized intersections.

Table 5 (p. 26) summarizes the level of service for each intersection. (Level of service calculations and assumptions regarding lane configurations have been provided to the City, and are available for public review at the Department of Development Services.) All signalized intersections currently operate at LOS C or better. However, the two ramp intersections of SR 4 at Hillcrest Avenue have LOS F on at least one of the movements. The intersections form a tight diamond interchange where traffic during peak periods typically backs up between the two intersections and onto the freeway. Even if these intersections were signalized, they would still function at LOS E.

The non-freeway portion of the SR 4 intersection at Lone Tree Way has LOS E and F conditions for the eastbound to northbound left turn movement during the AM and PM peak hours, respectively. The intersection of Empire Avenue at Lone Tree Way has LOS E conditions on the minor leg in both the AM and PM peak hours.

e. Traffic Levels of Service - Highways. Levels of service for highways near the project area were evaluated on a link basis using methods in the *Highway Capacity Manual* (1985). This method takes into account roadway type, land and shoulder width, grade, and the percentage of total traffic represented by trucks. Classifications are A through F, again with A the least congested and F the most congested.

As noted above (p. 23), there are five major facilities providing regional access to the study area: SR 4, Vasco Road, Byron Highway, Marsh Creek Road and Kirker Pass Road. The SR 4 freeway at the Willow Pass Grade summit has LOS F conditions during both AM and PM peak hours. Vasco Road south of Camino Diablo has LOS E conditions during both peak commute hours. The other three regional highways addressed in this analysis, Byron Highway, Marsh Creek Road west of Deer Valley Road and Kirker Pass Road at the summit, both have acceptable service levels during peak hours.

These highways have also been analyzed in terms of significance criteria developed in the course of implementation of Contra Costa County Measure C (1988), which is discussed further in the next section.

f. Standards of Significance. There are a variety of ways to describe the operational characteristics of roadways. Under the county's Measure C (1988) growth management program, operations are characterized under different approaches, depending on whether the roadway is classified as a "basic route" or as a "route

10 *Highway Capacity Manual*, "Special Report 109," Transportation Research Board, 1985.

Table 3

Level of Service Definitions: Signalized Intersections

Level of Service	V/C	Average Intersection Delay (sec./veh.)	Description
A	<.59	0.00-4.99	**Free Flow/Insignificant Delays:** No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.
B	.60-.69	5.00-14.99	**Stable Operation/Minimal Delays:** An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles.
C	.70-.79	15.00-24.99	**Stable Operation/Acceptable Delays:** Major approach phases fully utilized. Most drivers feel somewhat restricted.
D	.80-.89	25.00-39.99	**Approaching Unstable/Tolerable Delays:** Drivers may have to wait through more than one red signal indication. Queues may develop but dissipate rapidly, without excessive delays.
E	.90-.99	40.00-59.99	**Unstable Operation/Significant Delays:** Volumes at or near capacity. Vehicles may wait though several signal cycles. Long queues form upstream of intersection.
F	>.99	≥ 60.00	**Forced Flow/Excessive Delays:** Jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report No. 209, Washington DC., 1985.

Table 4

Level of Service Definitions: Unsignalized Intersections
(One- or Two-way Stop Controlled)

Reserve Capacity (PCPH) [a]	Level of Service	Expected Delay to Minor Street Traffic
≥ 400	A	Little or no delay
300-399	B	Short traffic delays
200-299	C	Average traffic delays
100-199	D	Long traffic delays
0-99	E	Very long traffic delays
[b]	F	[b]

[a] PCPH = passenger cars per hour

[b] When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement to the intersection.

Source: *Highway Capacity Manual* (see note at Table 3)

Table 5

Peak Hour Level of Service and V/C Ratio Comparison
Existing Conditions

Intersection	Control	AM Peak Hour V/C	AM Peak Hour LOS	PM Peak Hour V/C	PM Peak Hour LOS
1 Somersville/Buchanan	s	0.53	A	0.55	A
2 Lone Tree Way/SR 4 WB Ramps	s	0.57	A	0.49	A
3 Lone Tree Way/SR 4 EB Ramps	s	0.52	A	0.71	C
5 Hillcrest Ave./SR 4 WB Ramps*	u	0.84	D	0.66	B
6 Hillcrest Ave./SR 4 EB Ramps*	u	0.98	E	0.94	E
7 Deer Valley Rd./Hillcrest Ave.	s	0.29	A	0.43	A
8 Deer Valley Rd./Lone Tree Way	s	0.20	A	0.24	A
9 Deer Valley Rd./Balfour Rd.	u	–	A/A	–	A/A
10 Walnut Blvd./Balfour Rd.	s	0.66	B	0.72	C
13 Empire Ave/Laurel Rd.	u-A	–	A	–	A
14 O'Hara Ave/Laurel Rd.	u-A	–	B	–	B
15 SR 4/Laurel Rd.	u	–	A/A	–	A/A
16 O'Hara Ave/Lone Tree Way	u	–	A/A	–	A/B
17 Fairview Ave/Lone Tree Way	s	0.61	B	0.65	B
18 SR 4/Lone Tree Way	u	–	B/E	–	C
20 Hillcrest Ave/Lone Tree Way	s	0.36	A	0.34	A
21 Sand Creek Rd/Lone Tree Way	u	–	A/A	–	A/A
22 Empire Ave/Lone Tree Way	u	–	A/E	–	A/E
28 Lone Tree Way/J. Donlon Blvd.	s	0.35	A	0.74	C

V/C = Volume/capacity ratio
LOS = Level of service
s = signalized control
u = unsignalized control; does not have a volume/capacity ratio.
u-A = unsignalized intersection with all-way stop control

* The intersections of Hillcrest Avenue with the State Route 4 ramps are currently unsignalized, with level of service of F on minor street approaches. They are shown in this table as if they were signalized in order to facilitate comparison among alternatives.

Source: DKS Associates

of regional significance". In either case, a traffic impact on an intersection or roadway is considered significant if:

- ☐ Traffic conditions with the project cause the standard to be violated; or
- ☐ Traffic conditions with the project would increase traffic at any intersection or roadway that would be in violation of the standard, whether or not the project is built.

An impact is considered beneficial if the project would cause an improvement in conditions, but a standard is still violated.

(1) Measure C Basic Route Level of Service Standards (signalized intersections). Each jurisdiction in Contra Costa County has adopted traffic level of service standards to conform with Measure C requirements. These standards are applicable only at signalized intersections that are not on routes of regional significance (see *(2)* immediately below). The suburban standard of mid-LOS D (V/C ratio up to and including 0.89) would be applicable in the study area. The only existing study intersections that meet the Basic Route criteria are Empire Avenue/Laurel Road and O'Hara Avenue/Laurel Road.

(2) Measure C Standards for Routes of Regional Significance. Routes of regional significance are adopted by each jurisdiction in Contra Costa County and are designated, in each of four county subareas, by its Regional Transportation Planning Committee (in eastern Contra Costa County, TRANSPLAN). These routes are exempted from basic route level of service standards.

In lieu of the basic route LOS standards, traffic service objectives (TSOs) were proposed for adoption in December 1994 for the routes of regional significance. The TSO standards were approved by TRANSPLAN (Resolution 95-1) in May 1995 and the Contra Costa Transportation Authority approved the Countywide Plan (including the East County Plan) in July 1995. For signalized intersections along these routes, mid-LOS D (V/C up to and including 0.85) is the standard.

Table 6 (p. 28) presents the TSOs for routes of regional significance in the study area, and Table 7 (p. 30) provides a Traffic Delay Index summary of key regional routes that might be affected by the proposed project.

(3) Congestion Management Plan (CMP) Route Standards. The Contra Costa Transportation Authority, acting in its role as Congestion Management Agency for Contra Costa County, has set level of service standards for CMP routes. CMP routes are all state highways and "principal arterials" as defined in the CMP. The only CMP route in the study area other than SR 4 is Kirker Pass Road. Standards for CMP routes are LOS E, unless current conditions are LOS F, in which case the standard may be set by the Transportation Authority at LOS F. Jurisdictions are required to develop deficiency plans once a CMP route exceeds a standard. The standard for SR 4 is LOS F throughout East County, and is monitored at each of the links between interchanges.

(4) Unsignalized Intersection Standards. There are no formal standards for unsignalized intersections adopted by the City of Antioch or other concerned agencies. General engineering practice is therefore used here. Standards for unsignalized intersections are based on the ability of traffic movements through the intersection to find gaps in opposing traffic flows. Poor level of service on a particular movement often affects only a small number of vehicles, without delaying most travel movements. Therefore, LOS E is considered the maximum acceptable standard in this document.

Table 6

Action Plan Traffic Service Objectives

Regional Route	Traffic Service Objective	Schedule to Achieve	Peak Hour[a] Demand Threshold
SR 4 Freeway (including SR 4 Bypass Expressway)	▪ Morning Peak Hour Vehicle Occupancy 1.25 or higher ▪ Delay Index less than 3.0[b]	2010	n/a
SR 4 Non-Freeway SR 160 to Balfour Road	▪ LOS D or better at signalized intersections ▪ LOS E or better at unsignalized intersections ▪ Delay Index less than 3.0	2010	varies[c]
SR 4 Non-Freeway Balfour Road to San Joaquin County line	▪ LOS E or better calculated for rural highways ▪ Delay Index less than 2.0	2010	2,100
Vasco Road[d]	▪ Peak Hr. Vehicle Occupancy 1.3 or higher ▪ Delay Index less than 3.0	2010	n/a
Byron Highway	▪ LOS mid E or better (rural highway) ▪ Delay Index less than 3.0	2010	1,570
Marsh Creek Road (E. of Deer Valley Road)	▪ LOS mid E or better ▪ Delay Index less than 2.0	2010	1,200
Camino Diablo Road			1,200
Deer Valley Road (rural portion)			1,300
Kirker Pass Road	▪ LOS mid E or better ▪ Delay Index less than 2.0	2010	2,520
Suburban Arterial Routes[e]	▪ Intersection LOS mid D or better ▪ Delay Index less than 2.0	2010	varies[c]

[a] Volumes are the total of both directions.
[b] Calculated by dividing the peak hour travel by the off-peak travel time.
[c] The notation "varies" indicates that the threshold will depend on specific conditions at particular intersections.
[d] Threshold assumes the Vasco Road relocation project is completed.
[e] Includes the following roads: Lone Tree Way, Railroad Avenue, Leland Road, Delta Fair Boulevard, Buchanan Road, Somersville Road, Hillcrest Avenue, Deer Valley Road (northern portion), Walnut Boulevard, Willow Pass Road, Bailey Road (north of Leland), Evora Road, and the Buchanan Road Bypass (future route).

Source: DKS Associates

Table 7

Traffic Delay Index Summary
Existing Conditions[a]

Location	Peak Direction	Traffic Delay Index[b] AM Peak Hour	PM Peak Hour	Threshold
SR 4 Freeway *between* SR 160 & Kirker Pass Rd.	Westbound	1.5	1.2	3.0
Marsh Creek Rd. *between* Deer Valley Rd. & Kirker Pass Rd.	Westbound	1.0	0.9	2.0
Vasco Rd. *between* Camino Diablo Blvd. & I-580	Southbound	1.1	1.3	3.0
Kirker Pass Rd. *between* SR 4 & Clayton Rd.	Southbound	1.0	1.0	2.0

[a] Based on results presented in the Action Plan for Routes of Regional Significance, Eastern Contra Costa County, East County Action Plan, Proposal for Adoption, Adopted December 8, 1994.
[b] Calculated by dividing the peak hour travel time by the off-peak travel time.

Source: DKS Associates

III.B.2 Impacts

The transportation impacts section provides an evaluation of offsite impacts on traffic operation and capacity at different horizon years and a review of onsite circulation issues which include: internal access and circulation, traffic operations and capacity, roadway standards, pedestrian and bicycle circulation, emergency vehicle access and service deliveries, parking, construction impacts and transit.

a. Transportation and Circulation Elements of the Proposed Plan. The project was assumed to be constructed in two phases. Phase I is assumed to be complete by the year 2005, Phase II by the year 2010. It should be recognized that this phasing plan is based on reasonable assumptions of market absorption provided by the City of Antioch. The proposed project roadways and circulation by phase are described below.

(1) Phase I

Specific Plan Roadway Improvements. The project description of the FUA #2 Specific Plan includes the modification and/or addition of the following roadways:

- Internal project collector roadways would be constructed, including the SR 4 Bypass Frontage Road connecting Lone Tree Way with Laurel Road and loop collectors intersecting with Laurel Road, the Frontage Road, Vista Grande Drive, Country Hills Drive and Canada Valley Road.

- Sunset Drive would be constructed as a two-lane arterial from Lone Tree Way north to a temporary connection to SR 4.

- Wild Horse Drive would be constructed as a two-lane, southwest/northeast arterial connecting Hillcrest Avenue and Sunset Drive.

Local streets within the project would be addressed during the site plan review process for specific future developments.

Offsite Roadway Improvements. Project access would be provided from existing Lone Tree Way to the south and Empire Avenue to the east. Sunset Drive would be extended through the project from the north as a two-lane road terminating at Lone Tree Way. Laurel Road would be extended east through the project as a four-lane arterial connecting with Sunset Drive. Canada Valley Road, Country Hills Drive and Vista Grande Drive are all local roads that would be extended east into the project.

In addition to roadway improvements that would provide direct access to the project, other improvements are also planned for South Antioch. State Route 4 would be widened to four lanes from O'Hara Avenue to the 18th Street off/on-ramps. Empire Avenue would extend south as a two-lane arterial from Lone Tree Way and intersect with Sand Creek Road. Hillcrest Avenue would be widened to four lanes south of Lone Tree Way. Deer Valley Road would be widened to four lanes between Sand Creek Road and Lone Tree Way. New Sand Creek Road between Deer Valley Road and Empire Mine Road would be widened to four lanes. Dallas Ranch Road would be widened to four lanes as would James Donlon Boulevard to the northwest.

(2) Phase II

Specific Plan Roadway Improvements. The Phase I improvements described above also apply to Phase II of the project. In addition, the following roadway modifications would be made:

- Laurel Road would be widened to four lanes from Sunset Drive eastward.

- Sunset Drive would be widened to four lanes from Lone Tree Way to Wild Horse Drive.

Offsite Roadway Improvements. Phase I offsite roadway improvements are assumed to be in place. Additional project access would be provided by the SR 4 Bypass that would run north/south through the FUA #2 project area. Interchanges are proposed at Laurel Road and Lone Tree Way. The project Frontage Road would intersect with the SR 4 Bypass southbound ramps.

Other roadway improvements planned for South Antioch include several widenings and extensions. State Route 4 from O'Hara Avenue southward would be widened to four lanes. O'Hara Avenue would be widened to four lanes as would Fairview Avenue and Empire Avenue. Hillcrest Avenue would be extended as a four lane arterial south of Sand Creek Road. Dallas Ranch Road would be extended from Empire Mine Road to New Sand Creek Road (Empire Mine Road would be abandoned north of New Sand Creek Road). Lone Tree Way, from the intersection with James Donlon Boulevard to State Route 4, would be widened to four lanes.

Sand Creek Road would be extended as a four lane arterial from its present western terminus to the intersection of New Sand Creek Road and Deer Valley Road. The existing section of Sand Creek Road would also be widened to four lanes from its present western terminus eastward to Fairview Avenue. East of Fairview Avenue, Sand Creek Road would be extended as a four lane arterial past State Route 4. A new four-lane arterial would be constructed from State Route 4, south of the new intersection of Sand Creek Road and State Route 4, westward past Fairview Avenue. Balfour Road would be widened from approximately seven-tenths of a mile east of Deer Valley Road to State Route 4.

b. Analysis Scenarios. There are three alternatives associated with the project. Quantitative traffic analysis (using the traffic model described below) was performed for the alternative that would generate the greatest impacts. This is considered a "worst-case" scenario. Other alternatives were evaluated qualitatively in later sections of this report.

The impacts of the project were evaluated in the context of other growth that might reasonably be expected when each of the two project phases is complete. Project impacts were compared to conditions without the proposed project through analysis of six potential future growth and transportation improvement scenarios:

Forecast Year	Scenario Name	Project Status	Analyzed in:
2005	**Near Term without Plan**	No Project	Ch. III
2010	**Long Term (Recent Trends) without Plan**	No Project	Ch. III
2005	**Near Term with Plan Phase I**	Phase I	Ch. III
2010	**Long Term (Recent Trends) with Plan Buildout**	Phase II	Ch. III
Beyond 2010	**Long Term (East County Model Forecast[11]) without Plan**	No Project	Ch. V
Beyond 2010	**Long Term (East County Model Forecast[12]) with Plan Buildout**	Phase II	Ch. V

Development of the FUA #2 Specific Plan was assumed to occur in the following two phases:

- Phase I: 1,322 residential units, 186,000 square feet of office space, 344,000 square feet of commercial development, one school and one fire house.
- Phase II Buildout (including Phase I): 1,322 residential units, 1,860,012 square feet of office space, 1,050,885 square feet of commercial development, 128,065 square feet of public office, one school and one fire house.

The FUA #1 Sand Creek Specific Plan area was assumed to occur in the same time frame as the FUA #2 Specific Plan. This assumption provides a reasonable basis for evaluation of both projects.

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11 East County Model Forecasts, November 1994.
12 Ibid.

The following phasing was assumed for the FUA #1 Project:

- Phase I: 800 residential units, 75,000 square feet of medical office (Kaiser), two schools and one golf course
- Phase II Buildout (including Phase I): 7,400 residential units, 990,000 square-foot Kaiser Project (hospital, medical office, mixed-use, residential), 272,000 square feet of commercial development, 564,000 square feet of office space, four schools and one golf course

c. Methodology. The impact of the project on transportation was estimated using the Travel Model of Eastern Contra Costa County (East County Model). This model is one of four subarea models developed to aid transportation planning in Contra Costa County for the Measure C Growth Management Program. It uses assumptions regarding transportation network, demographic characteristics and land use to predict future travel on the transportation network. The model was validated to replicate 1990 traffic and transit volumes during AM and PM peak hours. It also has two forecast horizon years: 2000 and 2010. A more detailed description of the travel model is contained in Appendix C of this EIR.

(1) Housing and Employment Assumptions. The East County Model's housing and employment assumptions for year 2000 and year 2010 were developed in 1991 and 1992 and were generally consistent with those developed by the Association of Bay Area Governments (ABAG) for its reference document *Projections '90*. However, the pace of development in East County has slowed considerably since 1990 and as a result, the amount of growth forecast for years 2000 and 2010 forecasts is unlikely to be achieved by those years. These changing conditions have been reflected in the methodology used in this report in the following ways.

The year 2000 model forecasts were used as the basis for evaluating Phase I of the Specific Plan. However, the name for this horizon year was changed to "2005" to reflect the delayed pace of growth.

Phase II of the Specific Plan was evaluated under two sets of assumptions regarding future growth. The first set of assumptions reflects the base forecasts for year 2010 contained in the East County Model (those consistent with ABAG's *Projections '90*), which represents about 55,500 new housing units in East County between 1990 and 2010. It is clear that these forecasts are unlikely to be achieved by the year 2010 (referred as to Long Term [East County Model Forecast] in this document). Development allowed under the FUA #2 Specific Plan and the Sand Creek Specific Plan were added into the future land use assumptions. The analysis of the project under Long Term (East County Model Forecast) conditions is provided in Chapter V, *Cumulative Impacts*.

The second set of assumptions forms the basis of the long term analysis presented in this chapter and reflects a less aggressive, more realistic, growth scenario for the year 2010. This condition is referred to as Long Term (Recent Trends). Specific input assumptions are as follows:

Housing

- Total housing growth between 1990 and 2010 in all of East Contra Costa County was assumed to be 30,000 dwelling units. This represents an average annual growth of 1,500 dwelling units per year and is 40 percent less than the base 2010 forecasts.

- The East County 2010 Model land use was used for all non-FUA City of Antioch traffic analysis zones (TAZs) except for the Sky Ranch Project and the Chevron Project. A total of 400 dwelling units was assumed for the Sky Ranch Project and 950 units was assumed for the Chevron Project.[13]

- For the No-Project scenario, the FUA housing units were spread across non-Antioch East County TAZs proportional to the East County 2010 Model allocations.

- For the Project scenario, the FUA housing units were used and housing units in all non-Antioch TAZs were reduced to the 30,000 level proportional to the East County 2010 Model allocations.

Employment

- For the No-Project scenario, no FUA employment was assumed. All other East County TAZs were kept at the 2010 East County Model level.

- For the Project scenario, the FUA employment was used and the Antioch zones were kept at 2010 East County Model levels. All other East County Model TAZs were assumed to be at the 1990 East County level. As a result, the Antioch TAZs (including FUAs) use up all of the employment capacity in East County assumed in the East County Model for 2010.

Detailed information relating to the development of the Long Term (Recent Trends) scenario is provided in Appendix C of this EIR.

Table 8 summarizes the household assumptions and Table 9 shows employment assumptions by area for 1990, 2005, 2010, (Recent Trends) and 2010 (East County Forecast). For year 2005, the difference between the East County Model land use and land use used for this project is minor. Year 2010 differences are noted below.

- **Households - 2010 (Recent Trends).** Household growth was assumed to be 30,000 units in East County between 1990 and 2010 (53 percent growth). This level of household growth is about 21,300 units less than was assumed in the year 2010 East County model. All areas outside of East County would remain the same as the 2010 East County Forecast scenario.

- **Households - 2010 (East County Model Forecast).** Overall, a growth of about 55,500 households is assumed to occur in East County between 1990 and 2010 (98 percent growth). For the County as a whole, the growth is expected to be 103,000 households, or 34 percent. This level of household growth is over 4,000 households more than was assumed in the year 2010 East County model. All of the additional growth was assumed to be in East County.

- **Employment - 2010 (Recent Trends) and 2010 (East County Model Forecast).** Employment growth to year 2010 in East County is expected to be 39,600 jobs, or about 137 percent over 1990 levels. This level of growth is about 11,100 jobs more than was assumed in the year 2010 East County Model. The countywide total growth is about 129,500 jobs (47 percent).

13 Land use based on information from City of Antioch, Community Development Department staff.

(2) Offsite Transportation Network Assumptions. Since development in the Specific Plan area would occur over the course of many years, the transportation analysis recognizes that improvements to the transportation system would be likely to occur over that time. Transportation network improvements assumed for the East County Model for years 2000 and 2010 were considered a reasonable starting point for analyzing this project.

Table 8

Summary of Household Estimates

	Jurisdiction	1990	2005	2010 (Recent Trends)	2010 (East County Forecast)
Incorporated:	Antioch	20,354	31,443	33,093	33,093
	Brentwood	2,426	4,785	3,058	7,432
	Pittsburg	15,358	20,317	16,125	22,303
	Subtotal	38,138	56,545	52,276	62,828
Unincorporated:	Antioch SOI	1,291	3,346	4,863	5,726
	Brentwood SOI	736	3,442	2,434	8,192
	Bethel Island	1,270	2,045	1,561	3,180
	Byron	257	256	256	256
	Discovery Bay	2,185	2,552	2,243	2,552
	Knightsen	518	519	519	519
	Morgan Territory	114	114	114	114
	Oakley	5,193	7,601	6,196	11,812
	Southeast County	87	95	89	95
	Bay Point	5,885	7,058	6,706	7,058
	Other	998	601	691	1,275
	Subtotal	18,534	27,629	25,672	40,779
FUA #1 Sand Creek Specific Plan			800	7,403	7,403
FUA #2 Specific Plan			1,322	1,322	1,322
	Subtotal		2,122	8,725	8,725
TOTAL EAST COUNTY		56,672	86,296	86,673	112,332
West County		80,684	88,243	91,171	91,171
Central County		136,473	149,587	156,586	156,586
Tri-Valley (Contra Costa Portion)		30,857	41,108	47,584	47,584
TOTAL CONTRA COSTA		304,686	365,234	382,014	407,673

Note: SOI = Sphere of Influence; reflects 1990 city boundaries

Source: DKS Associates and City of Antioch Department of Development Services

Table 9

Summary of Employment Estimates

	Jurisdiction	1990	2005	2010 (Recent Trends)	2010 (East County Forecast)
Incorporated:	Antioch	10,730	19,098	23,321	23,173
	Brentwood	1,854	2,031	2,536	2,478
	Pittsburg	10,421	13,058	15,264	15,486
	Subtotal	23,005	34,187	41,137	41,137
Unincorporated:	Antioch SOI	2,153	2,466	2,466	2,653
	Brentwood SOI	328	310	3,226	3,293
	Bethel Island	268	875	1,201	1,202
	Byron	233	262	262	262
	Discovery Bay	54	327	327	327
	Knightsen	130	130	130	130
	Morgan Territory	45	45	45	45
	Oakley	912	1,838	1,850	1,838
	Southeast County	91	91	91	91
	Bay Point	1,252	1,492	1,830	1,830
	Other	513	528	277	237
	Subtotal	5,979	8,364	11,928	11,944
FUA #1	Sand Creek Specific Plan		421	6,857	6,857
FUA #2	Specific Plan	1,290	8,671	8,671	
	Subtotal		1,711	15,528	15,528
TOTAL EAST COUNTY		28,984	44,262	68,593	68,593
West County		64,040	78,444	87,550	87,550
Central County		148,226	174,377	195,210	195,210
Tri-Valley (Contra Costa Portion)		35,418	48,060	54,924	54,924
TOTAL CONTRA COSTA COUNTY		276,668	345,143	406,277	406,277

Note: SOI = Sphere of Influence; reflects 1990 city boundaries

Source: DKS Associates and City of Antioch Department of Development Services

The base transportation network assumed to be in place by year 2000 generally reflects all projects with funding commitments (see Figure 8).[14] This means they must either be on a jurisdictions' capital improve-

14 Routes of Regional Significance, East Contra Costa County, Analysis of Forecast Results, prepared for TRANSPLAN by DKS Associates, Final Draft April 29, 1993.

ment program (with funding commitment), the State Transportation Improvement Program (STIP), or be under construction. Key projects in the study area are:

- ❒ Vasco Road relocation as proposed by the Contra Costa Water District along the Modified County Line Alignment.
- ❒ SR 4 widening and grade lowering between Bailey Road and Port Chicago Highway (six lanes plus two auxiliary lanes).
- ❒ Laurel Road extended west as a four-lane road connecting with Hillcrest Road.
- ❒ Buchanan Road Bypass as a two-lane road.
- ❒ James Donlon widened to four lanes.
- ❒ BART extension to Bailey Road.

For the year 2010 analysis, all improvement projects included in approved planning documents in Contra Costa County jurisdictions were included (see Figure 9). These improvements (which are not necessarily funded) include:

- ❒ SR 4 Bypass as a 4-lane expressway from SR 4 freeway to Balfour Road, then as a 2-lane expressway to Walnut Boulevard, with Marsh Creek Road as a two-lane expressway connector to SR 4 on the east. Grade separated intersections to be provided at Laurel Road and Lone Tree Way.
- ❒ Numerous roadway widenings including Lone Tree Way, Balfour Road, Fairview Avenue, Central Boulevard, O'Hara Avenue, Empire Avenue and Laurel Road.
- ❒ SR 4 widening to six lanes plus two HOV lanes from Railroad Avenue to Hillcrest Avenue.
- ❒ Buchanan Road Bypass as a four-lane road.
- ❒ Sunset Avenue from Hillcrest Avenue to Lone Tree Way (south of Wild Horse Drive it is four lanes, north it is two lanes).
- ❒ Empire Avenue extended south to Sand Creek Road as a four-lane road.
- ❒ Widening of SR 4 to four lanes through Oakley and Brentwood.
- ❒ Fairview Avenue and Payne Avenue extensions.

(3) Analysis Procedures -Traffic Operating Conditions. Future operating conditions on study roadways and intersections were evaluated using the standards outlined in the Setting section. For the study roadways and intersections, existing level of service results are compared with future level of service results for each scenario. Approved or planned roadway and intersection improvements were assumed for each future scenario.

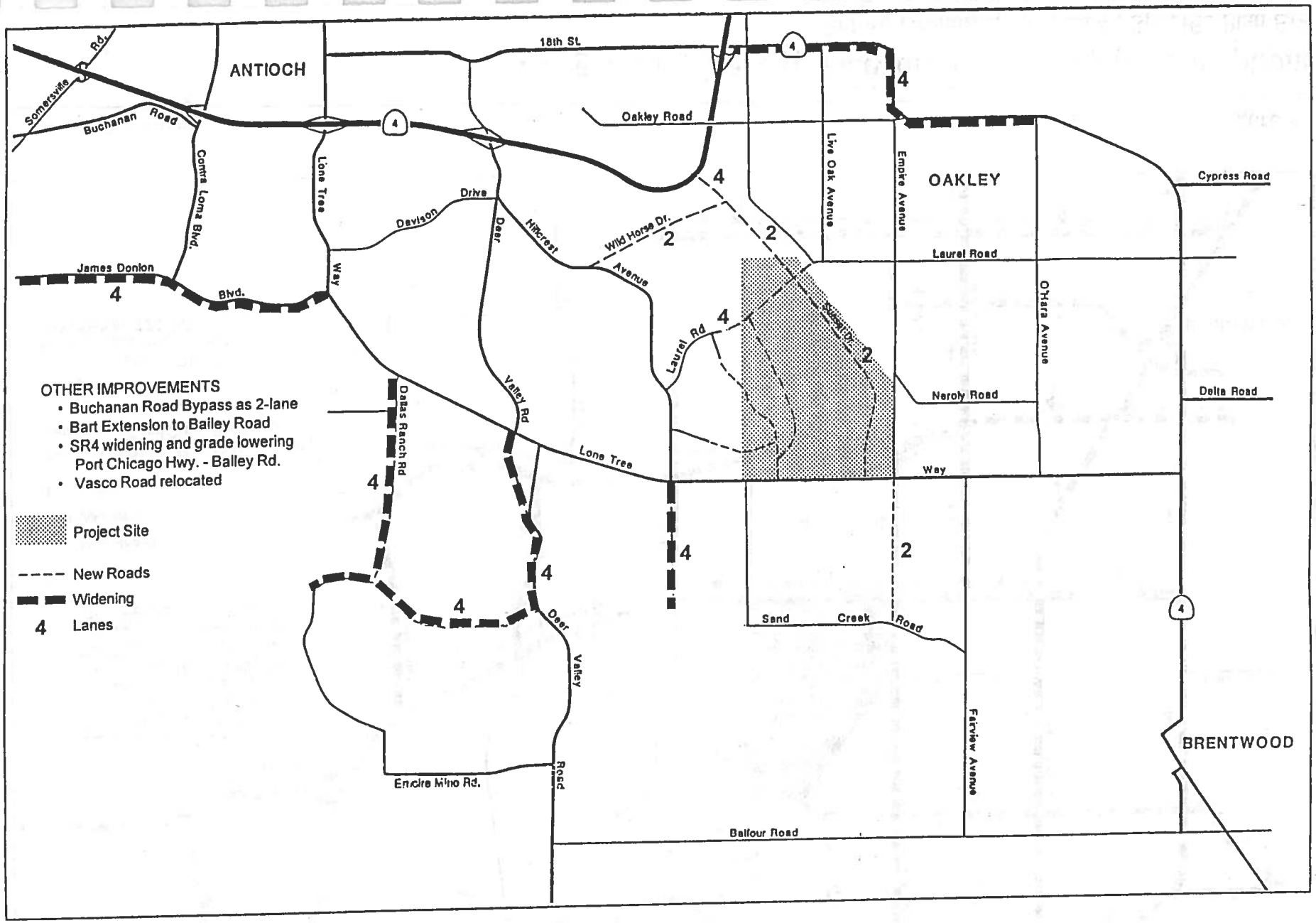


Figure 8

Source: DKS Associates

Near Term (Phase I) Network Improvement Assumptions

Future Urbanization Area #2 Specific Plan EIR

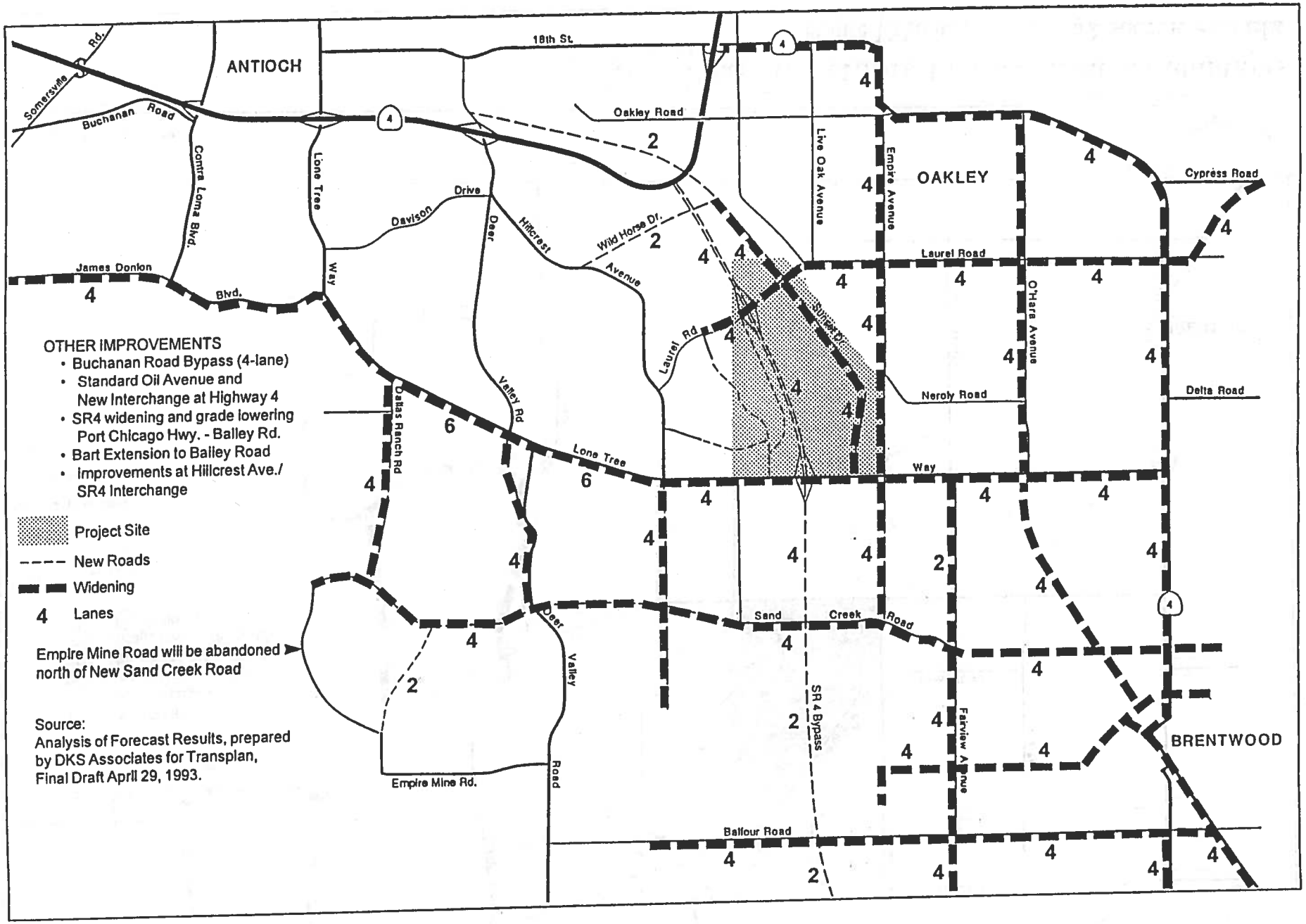


Figure 9

Source: DKS Associates

Long Term (Phase II) Network Improvement Assumptions

Future Urbanization Area #2 Specific Plan EIR

Both unsignalized and signalized study intersections were analyzed using Contra Costa County's VCCC intersection level of service program for signalized intersections. This was done so as to provide a simple method to compare existing and future intersections results with each other. A detailed explanation of the VCCC program is provided in the Setting section.

Peak hour signal warrant analysis was also performed for unsignalized study intersections.

(4) Study Area Definition. The project study area was developed with City of Antioch staff. Only critical intersections and roadways that could be potentially impacted by the Project were identified as study locations. As a result, not every intersection and roadway that project traffic would potentially pass through was selected as a study location.

The 19 existing intersections analyzed in the Setting section (Table 5, p. 27) were also evaluated for the future conditions scenarios. Several new intersections would be created in the future as a result of planned roadway improvements, as well as the project itself. The following 21 additional intersections were analyzed for the future conditions scenarios. North/south streets are listed first except for highway intersections (listed first) and project driveway intersections (listed last).

- Deer Valley Road/New Sand Creek Road
- Sunset Drive/Lone Tree Way
- Empire Avenue/Sand Creek Road
- Fairview Avenue/Sand Creek Road
- Walnut Boulevard/Marsh Creek Road [15]
- Hillcrest Avenue/Laurel Road
- Dallas Ranch Road/Lone Tree Way
- SR 4 Bypass NB ramps/Laurel Road
- SR 4 Bypass SB ramps/Laurel Rd./Frontage Rd.
- SR 4 Bypass/NB ramps/Lone Tree Way
- SR 4 Bypass/SB ramps/Lone Tree Way
- SR 4 Bypass/Sand Creek Road
- SR 4 Bypass/Balfour Road
- Sunset Drive/Laurel Road
- Dallas Ranch Road/New Sand Creek Rd.
- Hillcrest Avenue/New Sand Creek Road
- Sunset Drive/Wild Horse Drive
- Canada Valley Road/Lone Tree Way
- Canada Valley Road/Laurel Road
- Neroly Road/Laurel Road
- South Dallas Ranch Rd./New Sand Creek Road

Figure 10 (p. 43) shows the study intersections and roadways.

In addition to these study intersections, driveway and internal site intersections were evaluated. The majority of these intersections would be intersections of collector and local roads with stop sign control. These intersections are highlighted in the report if they exceed the standards outlined in the Setting section, meet signal warrant requirements, or require mitigation to improve access or safety.

Fewer intersections were analyzed for the Near Term scenarios because not all of the project would be built until Phase II. The Without Plan scenarios do not include evaluation of project roadways or intersections.

(5) Internal Project Circulation Evaluation Procedures. Aspects of the proposed project concerning access, internal circulation, sight distance, emergency vehicle access, parking, intersection and roadway standards, pedestrian and bicycle circulation and impacts due to construction were evaluated based on commonly accepted traffic engineering standards.

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15 Existing intersection not analyzed in Setting section.

d. Trip Generation and Distribution.

(1) Trip Generation. Trip generation of the project was calculated using the trip generation equations embedded in the East County Model. The model estimates the amount of different types of travel expected to come from different land uses on a daily basis. Trip types are:

- Home-based work
- Home-based shop/other
- Home-based social/recreation
- Home-based school
- Home-based Diablo Valley College
- Non-home-based

Within Contra Costa County the trip generation model consists of:

- A submodel to estimate households by income group and household size.
- A set of equations to estimate trip productions (i.e., the "home" end of a trip) using household size and income.
- A set of equations to estimate trip attractions, using total employment, retail employment, service employment, other employment, households, population and college enrollment.

After trip distribution and mode choice procedures are applied (see explanation below), peaking factors are applied to obtain trip patterns for AM and PM peak hours.

Table 10 summarizes the trip generation estimates for the project at Near Term and Buildout. In the Near Term (Phase I), the project would generate 1,780 vehicle trips in the AM peak hour, of which approximately 156 trips would be internal to the project site. The project would generate 2,482 vehicle trips in the PM peak hour, of which approximately 278 trips would be internal to the project site.

For Phase II, the project would generate about 5,000 vehicle trips in the AM peak hour. Under the Recent Trends scenario, 568 trips would be internal to the project site. The project would generate 6,436 vehicle trips in the PM peak hour, of which 934 trips would be internal to the project site.

(2) Trip Distribution. A gravity model was used to estimate the interaction of travel between different TAZs. The gravity model assumes that the amount of travel from one zone to all other zones is proportional to the number of trip attractions in the other zone and inversely proportional to the travel impedance between the two zones. Impedances are measured using congested travel speeds for work trips. For non-work trips, free flow speeds are used. The travel impedances have a different effect on the average trip lengths for the different trip purposes.

Trip distribution for travel to and from the project at Near Term and Long Term (Recent Trends) are shown in Tables 11 and 12 respectively. At the Phase I level of development, 8 to 11 percent of the project's peak period traffic is expected to remain onsite. By far the greatest trip distribution is to other areas of Antioch, with over 40 percent of AM and PM peak hour trips.

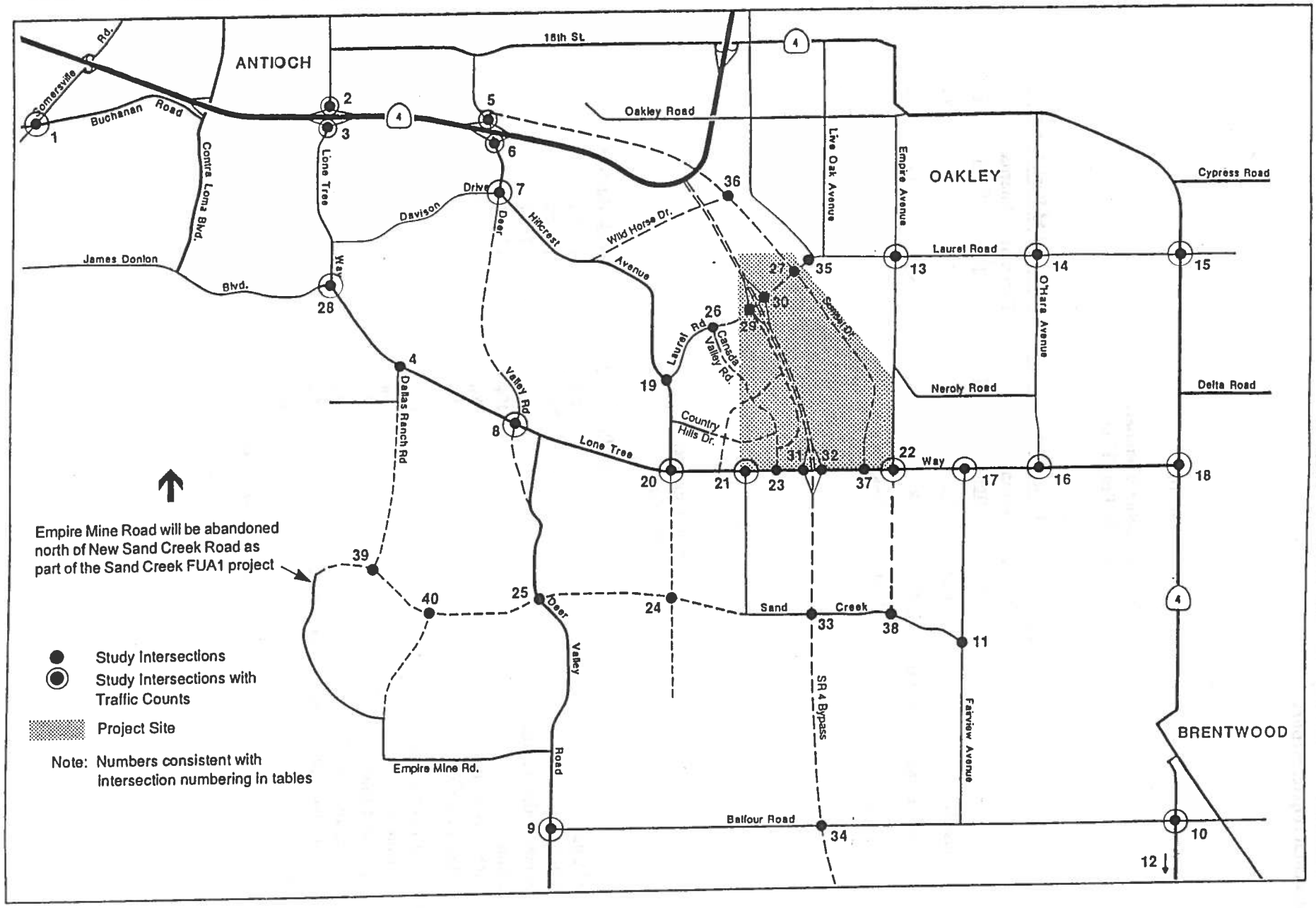


Figure 10

Source: DKS Associates

Study Intersections

Future Urbanization Area #2 Specific Plan EIR

Table 10

Trip Generation Summary
AM and PM Peak Hours

	AM Peak Hour			PM Peak Hour		
	External Trips	Internal Trips	Total	External Trips	Internal Trips	Total
Near Term (Phase I)	1,624	156	1,780	2,204	278	2,482
Long Term (Recent Trends - Phase II)	4,435	568	5,003	5,502	934	6,436

Source: DKS Associates

Table 11

Trip Distribution
Near Term

	AM Peak Period	PM Peak Period
FUA #2	8.8%	11.2%
Brentwood	10.6%	11.6%
Oakley/Bethel Island	11.9%	12.5%
Antioch	41.4%	47.1%
Pittsburg/Bay Point	4.7%	4.4%
Rest of East County	1.6%	1.5%
Rest of Contra Costa County	7.1%	4.8%
San Ramon	5.9%	1.5%
Dublin/Pleasanton/Livermore	1.5%	0.8%
San Joaquin County	0.0%	0.0%
Other (Outside of Contra Costa County)	6.5%	4.6%
TOTAL	100.0%	100.0%

Source: DKS Associates

Table 12

Trip Distribution
Long Term (Recent Trends)

	AM Peak Period	PM Peak Period
FUA #2	11.4%	14.5%
Brentwood	8.8%	8.3%
Oakley/Bethel Island	10.9%	9.0%
Antioch	48.2%	53.1%
Pittsburg/Bay Point	4.4%	3.8%
Rest of East County	2.7%	2.0%
Rest of Contra Costa	5.6%	3.8%
San Ramon	3.3%	1.7%
Dublin/Pleasanton/Livermore	0.5%	0.4%
San Joaquin County	0.0%	0.0%
Other (Outside of Contra Costa County)	4.3%	3.4%
TOTAL	100.0%	100.0%

Source: DKS Associates

Because all of the proposed housing for the project has already been assumed in the Near Term, the distribution changes only slightly for the Long Term. Between 9 and 15 percent of the trip distribution is internal to the project site under Long Term conditions. The rest of Antioch still has a high proportion of trip distribution, from 39 to 53 percent.

(3) Mode Choice. The mode choice models within Contra Costa County are multinomial logit models that are consistent with the MTC regional models. These models are used to determine the number of trips generated by each mode type by trip purpose. For home-based-work trip purposes, there are four possible modes:

- ❒ Transit
- ❒ Drive-alone-auto
- ❒ 2-person auto
- ❒ 3+ person auto

For other trip purposes, only auto and transit trips are determined. An auto occupancy factor is used to convert auto person trips to auto vehicle trips that can be assigned onto the network.

Outside of Contra Costa County, fixed regional mode shares are taken directly from the MTC Regional Model and are used as a basis for mode choice. The model allows for the percentage of transit trips to shift based on a pivot point logic for any changes in the Contra Costa County transit network, such as BART extensions.

(4) Trip Assignment. Before auto and transit trips can be assigned to the network, they are converted from 24-hour person-trip tables in production-attraction format to AM peak hour, PM peak hour and off-peak period trip tables in origin-destination format.

Assignments are done using a capacity-constrained equilibrium method. The first iteration of a peak-hour assignment uses congested travel speeds from a previous assignment. Then, assignments are iterated using

capacity-constrained link travel speeds from the previous assignment. The assignments are repeated until the differences in travel speed from one iteration to the next are insignificant, at which time *equilibrium* is said to be achieved.

e. Effects Found to be Potentially Significant. The following impact analysis identifies potentially significant transportation impacts of the project under the Near Term and Long Term/Recent Trends future scenarios described on p. 33. (Note that the impacts of project buildout under the Long Term/East County Model Forecast scenario are discussed in Chapter V.)

The Phase I and Phase II (Buildout) development scenarios are discussed first, each under its own boxed heading. At the end of the impact discussion is presented an analysis of internal circulation, also under its own boxed heading. This organization of the impact discussion is mirrored in the presentation of mitigation measures that concludes the transportation section of this chapter. A brief note on project phasing precedes the mitigation measures section.

Project Phase I Impacts
Near Term with Year 2005 Growth and Transportation Improvements

Highways and Rural Road Operating Conditions. Impacts on highways and rural roads where service levels are not controlled by intersections are discussed in this section. Figure 11 shows the local peak hour traffic volumes on study roadways for the Near Term – without and with project traffic – and Figure 12 shows regional traffic volumes. Table 13 shows the traffic volumes as they relate to traffic service objectives (TSOs). All of the study roadways would meet the TSO standards.

Table 13

Travel Time and Traffic Delay Index Summary
Near Term

Location	Peak Direction	AM Peak Hour	PM Peak Hour	Threshold
SR 4 Freeway *between* SR 160 & Kirker Pass Rd.	Westbound	1.8	1.9	3.0
Marsh Creek Rd. *between* Deer Valley Rd. & Kirker Pass Rd.	Westbound	1.5	0.6	2.0
Vasco Rd. *between* Camino Diablo Blvd. & I-580	Southbound	1.9	2.0	3.0
Kirker Pass Rd. *between* SR 4 & Clayton Rd.	Southbound	1.2	1.3	2.0

[a] Calculated by dividing AM peak hour travel time by off-peak travel time. Based on results presented in the Action Plan for Routes of Regional Significance, Eastern Contra Costa County, East County Action Plan, Adopted December 8, 1994.

Source: DKS Associates

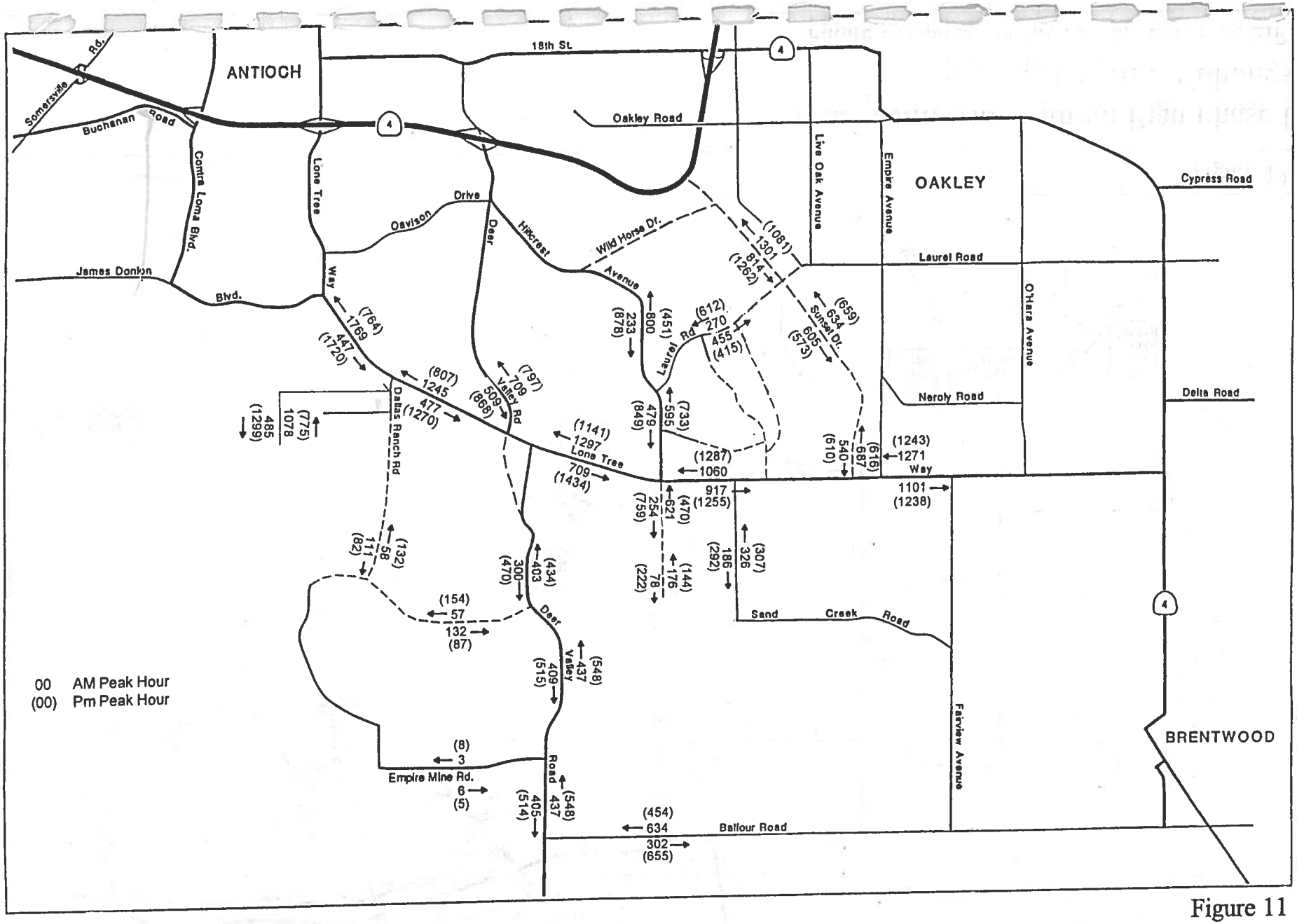


Figure 11

Source: DKS Associates

Near Term with Plan Phase I Local Traffic Volumes

Future Urbanization Area #2 Specific Plan EIR

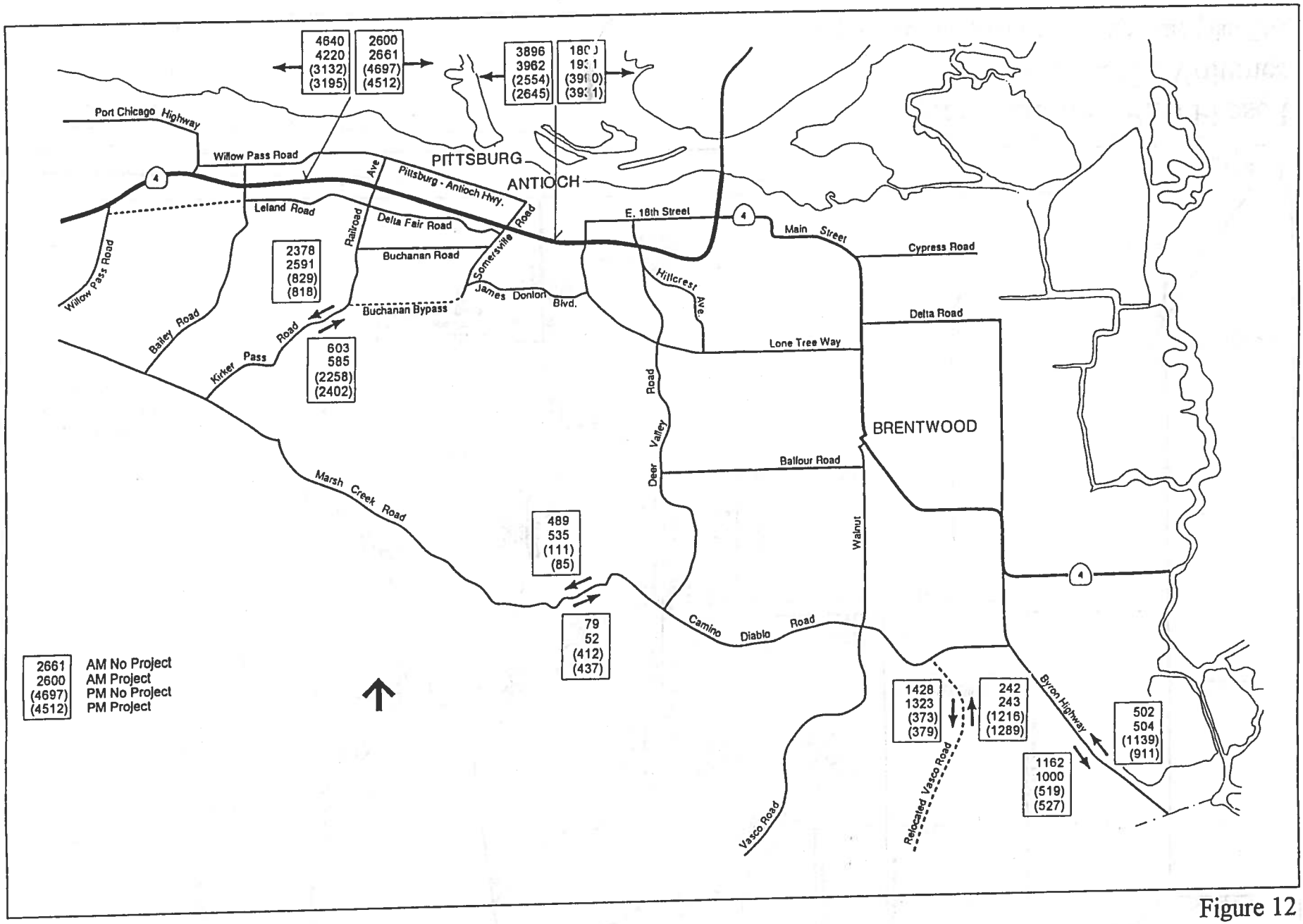


Figure 12

Source: DKS Associates

Near Term with/without Plan Phase I Regional Traffic Volumes

Future Urbanization Area #2 Specific Plan EIR

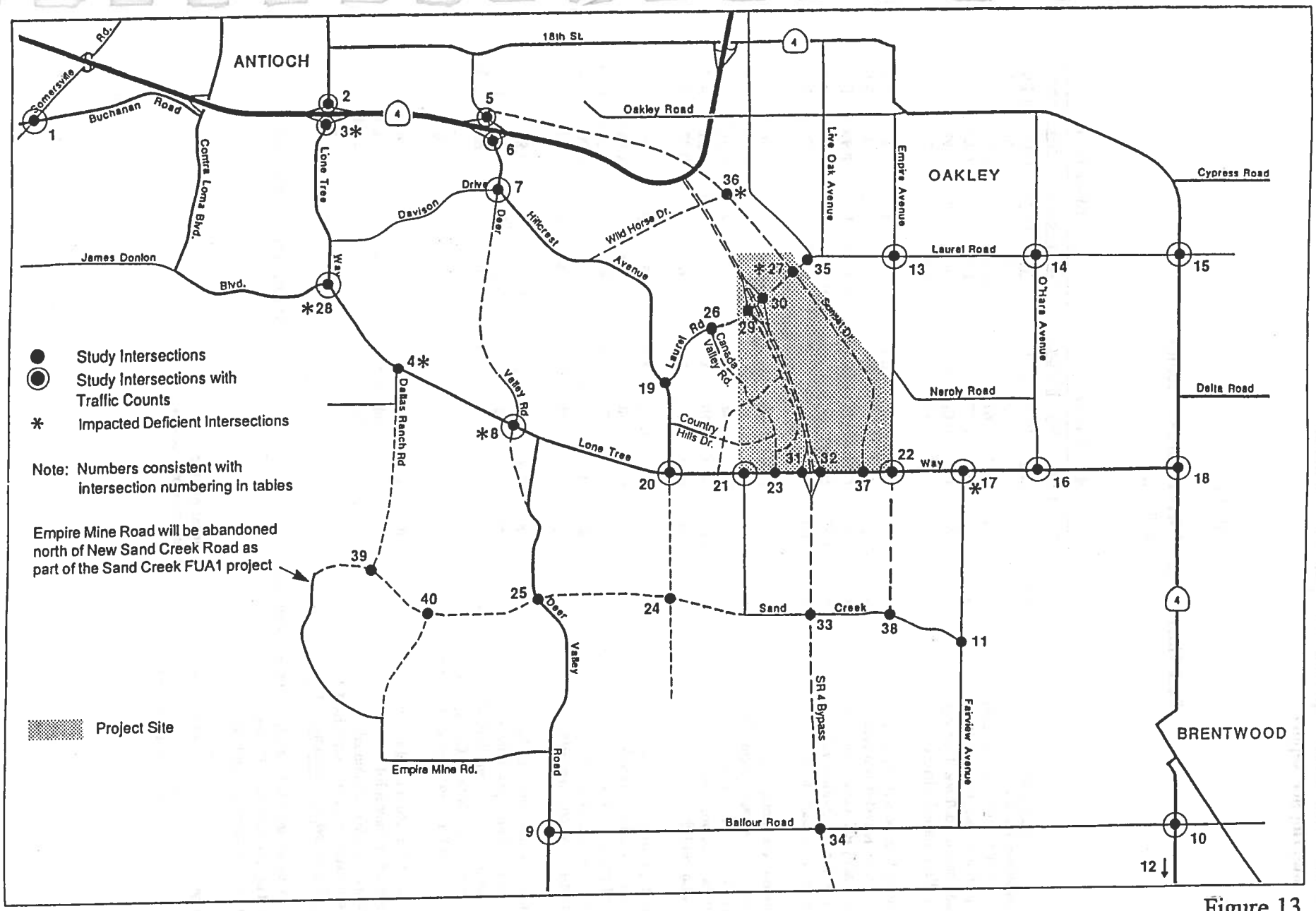


Figure 13

Source: DKS Associates

Near Term with Plan Phase I

Study Intersections Significantly Impacted by the Project

Future Urbanization Area #2 Specific Plan EIR

Table 14

Peak Hour Levels of Service and V/C Ratios
Near Term

		AM Peak Hour				PM Peak Hour			
		No Project		With Project		No Project		With Project	
Intersection	Control	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
1 Somersville/Buchanan	s	0.51	A	0.60	A	0.45	A	0.52	A
2 SR 4 WB Ramps/Lone Tree Way	s	0.74	C	0.67	B	0.58	A	0.62	B
3 SR 4 EB Ramps/Lone Tree Way	s	0.62	B	0.57	A	0.84	D	**0.87**	D
4 Dallas Ranch Rd./Lone Tree Way	u	0.77	C	0.81	D	0.94	E	**0.98**	E
5 SR 4 WB Ramps/Hillcrest Ave.	s	1.03	F	0.87	D	0.93	E	0.91	E
6 SR 4 EB Ramps/Hillcrest Ave.	s	1.13	F	0.95	E	1.58	F	1.35	F
7 Deer Valley Rd./Hillcrest Ave.	s	0.54	A	0.46	A	0.74	C	0.64	B
8 Deer Valley Rd./Lone Tree Way	s	0.79	C	0.68	B	0.83	D	**0.93**	E
9 Deer Valley Rd./Balfour Rd.	u	0.63	B	0.58	A	0.69	B	0.70	B
10 Walnut Blvd./Balfour Rd.	s	0.66	B	0.69	B	0.67	B	0.69	B
11 Fairview Ave./Sand Creek Rd.	u	0.36	A	0.43	A	0.41	A	0.46	A
12 Walnut Blvd./Marsh Creek Rd.	s	0.64	B	0.61	B	0.58	A	0.60	A
13 Empire Ave/Laurel Rd.	u	0.34	A	0.54	A	0.35	A	0.57	A
14 O'Hara Ave/Laurel Rd	s	0.12	A	0.20	A	0.16	A	0.21	A
15 SR 4/Laurel Rd.	u	0.29	A	0.35	A	0.42	A	0.42	A
16 O'Hara Ave/Lone Tree Way	u	0.55	A	0.63	B	0.63	B	0.75	C
17 Fairview Ave/Lone Tree Way	s	0.79	C	**0.98**	E	0.91	E	**1.06**	F
18 SR 4/Lone Tree Way	s	0.71	C	0.77	C	0.81	D	0.83	D
19 Hillcrest Ave./Laurel Rd.	s	0.63	B	0.59	A	0.81	D	0.70	B
20 Hillcrest Ave/Lone Tree Way	s	0.69	B	0.65	B	0.88	D	0.80	C
21 Sand Creek Rd/Lone Tree Way	u	0.78	C	0.70	B	0.91	E	0.86	D
22 Empire Ave/Lone Tree Way	u	0.80	C	0.85	D	0.86	D	0.86	D
23 Canada Valley Rd. /Lone Tree Way	u	0.41	A	0.41	A	0.43	A	0.63	B
24 Hillcrest Ave./New Sand Creek Rd.†	u	-		-		-		-	-
25 Deer Valley Rd./New Sand Creek Rd.*	u	-		0.27	A	-		0.36	A
26 Canada Valley Rd./Laurel Rd.	u	0.05	A	0.11	A	0.10	A	0.16	A
27 Sunset Drive/Laurel Rd.*	u	-		**0.90**	E	-		**0.99**	E
28 Lone Tree Way/J. Donlon Blvd.	s	1.01	F	**1.04**	F	1.38	F	**1.44**	F
29 SR 4 Bypass SB ramp/Laurel Rd.†	s	-		-		-		-	
30 SR 4 Bypass NB Ramp/Laurel Rd. †	s	-		-		-		-	

(*Continued on next page*)

* Intersection does not exist in No-project scenarios

† Not an intersection in Phase I

0.90 Denotes a significant impact

Abbreviations: V/C = Volume/capacity ratio; LOS = Level of service; s = signalized control; u = unsignalized control

Table 14

Peak Hour Levels of Service and V/C Ratios
Near Term
(*Continued*)

		AM Peak Hour				PM Peak Hour			
		No Project		With Project		No Project		With Project	
Intersection	Control	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
31 SR 4 Bypass SB Ramp/Lone Tree Way†	s	-		-		-		-	
32 SR 4 Bypass NB Ramp/Lone Tree Way†	s	-		-		-		-	
33 SR 4 Bypass/Sand Creek Rd. †	s	-		-		-		-	
34 SR 4 Bypass/Balfour Rd. †	s	-		-		-		-	
35 Neroly Rd./Laurel Rd.	u	0.35	A	0.27	A	0.53	A	0.30	A
	u	-		**0.90**	E	-		**1.02**	F
36 Sunset Drive*/Wild Horse Rd.									
37 Sunset Drive/Lone Tree Way*	u	-		0.70	B	-		0.75	C
38 Empire Avenue/Sand Creek Rd.†	u	-		-		-		-	
39 Dallas Ranch /New Sand Creek Rd.*	u	-		0.10	A	-		0.12	A
40 S. Dallas Ranch Rd./New Sand Creek Rd.*	u	-		0.04	A	-		0.05	A

Note: The intersections of Hillcrest Avenue with the SR 4 ramps are currently unsignalized, with poor levels of service on minor street approaches. They are shown here as if they were signalized in order to facilitate comparison among alternatives.

* Intersection does not exist in No-project scenarios
† Not an intersection in Phase I
0.90 Denotes a significant impact

Abbreviations: V/C = Volume/capacity ratio; LOS = Level of service; s = signalized control; u = unsignalized control

Source: DKS Associates

Intersections. Table 14 shows the AM and PM peak hour level of service (LOS) estimates at intersections both with and without the Near Term project in the context of year 2000 traffic conditions. Figure 13 shows intersections significantly impacted by the project. The project can affect study intersections in a variety of ways:

Not a Significant Impact

- ❒ Worsen conditions at locations that are acceptable without the project and remain acceptable with the project
- ❒ Improve conditions at locations that either operate at acceptable or deficient conditions without the project

A Significant Impact

- ❒ Worsen conditions at locations that are deficient without the project
- ❒ Worsen conditions to deficient levels at locations that are acceptable without the project (including new locations)

Eight study intersections would operate at deficient conditions in at least one peak hour (i.e., AM or PM) for the Without Project scenario:

- SR 4 westbound ramps/Hillcrest Avenue
- SR 4 eastbound ramps/Hillcrest Avenue
- Lone Tree Way/James Donlon Boulevard
- Sand Creek Road/Lone Tree Way
- Fairview Avenue/Lone Tree Way
- Dallas Ranch Road/Lone Tree Way
- Hillcrest Avenue/Lone Tree Way
- Empire Avenue/Lone Tree Way

(1) **[Impact B1]** ***The addition of project traffic would worsen deficient conditions in at least one peak hour at the following locations.***

- Lone Tree Way/James Donlon Boulevard
- Fairview Avenue/Lone Tree Way
- Dallas Ranch Road/Lone Tree Way

(2) **[Impact B2]** ***The project would cause a deterioration in the level of service to an unacceptable level in at least one peak hour at the following locations:***

- SR 4 eastbound ramps/Lone Tree Way
- Sunset Drive/Laurel Road
- Deer Valley Road/Lone Tree Way

(3) **[Impact B3]** ***The new intersection of Sunset Drive/Wild Horse Drive would operate at unacceptable conditions in both peak hours with the Project.***

The project would improve operations in both peak hours at the intersections of Hillcrest Avenue at the SR 4 eastbound and westbound ramps. However, these locations would continue to operate at deficient conditions in at least one peak hour. The project would improve operations to acceptable conditions at Sand Creek Road/Lone Tree Way and Hillcrest Avenue/Lone Tree Way in the PM peak hour.

Signal warrants were evaluated using the Caltrans Peak Hour Signal Warrant (No. 11). An intersection should not be signalized unless it meets at least one of the Caltrans Signal Warrants. Unsignalized intersections meeting the Signal Warrant minimum requirement would experience significant delays in the peak hours without signalization. Safety may also be a critical issue. As a result, a significant impact was identified for any unsignalized study intersection meeting the Peak Hour Signal Warrant criteria. The urban conditions criteria were assumed for this analysis. The following five unsignalized intersections would meet the peak hour warrant in at least one peak hour for the Without Project scenario:

- Deer Valley Road/Balfour Road
- Lone Tree Way/Sand Creek Road
- Fairview Avenue/Sand Creek Road
- O'Hara Avenue/Lone Tree Way
- Empire Avenue/Lone Tree Way

(4) **[Impact B4]** ***The five intersections listed above would also meet the peak hour warrant for the Project scenario.***

(5) **[Impact B5]** ***The following intersections would meet the peak hour warrant (in at least one peak hour) for the Project scenario:***

- Sunset Drive/Lone Tree Way
- Empire Avenue/Laurel Road
- Canada Valley Road/Lone Tree Way
- Sunset Drive/Laurel Road
- Sunset Drive/Wild Horse Drive
- Lone Tree Way/Regional Commercial Use Driveway

Project Phase II Impacts
Long Term (Recent Trends) with Year 2010 Growth and Transportation Improvements

Highways and Rural Road Proposed Traffic Service Objectives.[16] Table 15 shows the estimated travel time and traffic delay index for Without Project and Project traffic volumes on five regional roadways.

None of the five study roadways exceeds the traffic index threshold for either the Without Project or Project scenarios.

Highways and Rural Road Operating Conditions. Figure 14 shows the local peak hour traffic volumes on study roadways for the Long Term (Recent Trends) scenario with project traffic and Figure 15 shows regional traffic volumes with and without project traffic.

The project would significantly reduce peak direction traffic volumes (between 215 and 550 vehicles) in both peak hours on SR 4 west of Lone Tree Way and SR 4 Bypass north of Lone Tree Way. Minor reductions would occur on SR 4 east of Bailey Road and Vasco Road.

Peak hour traffic volumes would be expected to decrease on SR 4 in the study area due to the level of employment and housing projected for East County by 2010. As houses and jobs are created in East County, employees would relocate closer to their jobs. As a result, commute trip lengths decrease, reducing trips on regional routes such as SR 4 but increasing traffic on arterials and local roads.

Intersections. Table 16 shows the AM and PM peak hour level of service (LOS) estimates for the Year 2010 Without Project and Project Long Term (Recent Trends) conditions. Figure 16 shows intersections significantly impacted by the project. A total of nine intersections would operate at deficient conditions in at least one peak hour for the Without Project scenario:

- SR 4 eastbound ramps/Lone Tree Way
- SR 4 eastbound ramps/Lone Tree Way
- SR 4 westbound ramps/Hillcrest Avenue
- SR 4 eastbound ramps/Hillcrest Avenue
- Lone Tree Way/James Donlon Boulevard
- SR 4 Bypass/Sand Creek Road
- SR 4 Bypass/Balfour Road
- Dallas Ranch Road/Lone Tree Way
- Hillcrest Avenue/Lone Tree Way

(6) **[Impact B6]** ***The addition of project traffic would worsen deficient conditions at the following locations:***

- SR 4 westbound ramps/Lone Tree Way
- SR 4 westbound ramps/Hillcrest Avenue
- SR 4 eastbound ramps/Hillcrest Avenue
- Lone Tree Way/James Donlon Boulevard
- Dallas Ranch Road/Lone Tree Way
- Hillcrest Avenue/Lone Tree Way

(7) **[Impact B7]** ***The following five intersections would deteriorate to deficient level of service conditions as a result of the Project:***

- Deer Valley Road/New Sand Creek Road
- Hillcrest Avenue/Laurel Road

16 *Action Plan Traffic Service Objectives*, Proposed Revisions: May 12, 1995.

- Deer Valley Road/Lone Tree Way
- Dallas Ranch Road/New Sand Creek Road
- Dallas Ranch Road/Lone Tree Way

Table 15

Travel Time and Traffic Delay Index Summary
Long Term (Recent Trends)

		Travel Times[a]						
		Off-Peak Hour[b]		AM Peak Hour[b]		Traffic Delay Index[b]		
Location	Peak Direction	Without Project	Project	Without Project	Project	Without Project	Project	Threshold
SR 4 Freeway *between* SR 160 & Kirker Pass Rd.	West-bound	8.33	8.33	12.08	11.24	1.45	1.35	3.0
SR 4 Bypass *between* SR 160 & Balfour Rd.	South-bound	5.63	5.63	5.66	5.64	1.01	1.00	3.0
Marsh Creek Rd. *between* Deer Valley Rd. & Kirker Pass Rd.	West-bound	20.69	20.69	23.14	23.23	1.12	1.12	2.0
Vasco Rd. *between* Camino Diablo Blvd. & I-580	South-bound	19.67	19.67	23.26	22.58	1.19	1.15	3.0
Kirker Pass Rd. *between* SR 4 & Clayton Rd.	South-bound	12.05	12.05	12.16	12.21	1.01	1.01	2.0

[a] In minutes.

[b] Calculated by dividing the AM peak hour travel time by the off-peak travel time.

Source: DKS Associates

The project would reduce (improve) the volume-to-capacity ratio at the intersections of SR 4 Bypass with Sand Creek Road and Balfour Road in both peak hours. However, each intersection would continue to operate at deficient conditions in at least one peak hour. This is not a significant impact.

The following six intersections would meet the peak hour signal warrant in at least one peak hour in the Without Project scenario:

- Lone Tree Way/Sand Creek Road
- Empire Avenue/Laurel Road
- O'Hara Avenue/Laurel Road
- O'Hara Avenue/Lone Tree Way
- Sunset Drive/Laurel Road
- Dallas Ranch Road/Lone Tree Way

(8) **[Impact B8]** ***Except for O'Hara Avenue/Laurel Road, all of the intersections listed above would also meet the peak hour warrant for the Project scenario.***

(9) **[Impact B9]** ***The following intersections would meet the peak hour warrant (in at least one peak hour) for the Project scenario:***

- Deer Valley Road/New Sand Creek Road
- Sunset Drive/Lone Tree Way
- Canada Valley Road/Lone Tree Way
- Dallas Ranch Road/New Sand Creek Road
- Hillcrest Avenue/New Sand Creek Road
- New Sand Creek Road/Kaiser Driveway
- New Sand Creek Road/Zone 451 Residential Access
- New Sand Creek Road/South Dallas Ranch Road
- New Sand Creek Road/Zone 453 Residential Access
- Dallas Ranch Road/Zone 434 Residential Access
- Deer Valley Road/Kaiser Access
- Deer Valley Road/Zones 434/455 Residential Access
- Hillcrest Avenue/Zones 459/460 Residential Access
- Lone Tree Way/Regional Commercial Driveways (2)

Internal Circulation Analysis

Access and Circulation. The SR 4 Bypass would provide regional access to the Project in 2010. Interchanges are proposed within the Project at Laurel Road and Lone Tree Way (north side only). Lone Tree Way, Empire Road and Laurel Road would all be four-lane arterials providing access to the project. A SR 4 Bypass frontage road (two-lanes) would extend south from the Laurel Road southbound ramps to Canada Valley Road. Sunset Drive (two-lanes) would provide north/south access to the major employment portion of the Project on the east. Canada Valley Road, Vista Grande Drive and County Hills Drive would all be extended into the Project as two-lane roads. Two internal loop collectors (two-lane) are shown west of the SR 4 Bypass. The northern loop would connect with Laurel Road, the Frontage Road (two places) and Vista Grande Drive. The southern half-loop would connect with the Frontage Road and Vista Grande Drive. Some stub connectors are shown off these loops.

The impacts noted below reflect the fact that FUA #2 planning is at the Specific Plan stage, rather than the site development stage. They will serve as a " checklist" to assure that site-specific planning to implement the Specific Plan will both conform to the Plan and avoid adverse impacts that might occur in the absence of planning and environmental review.

(10) **[Impact B10]** ***Providing adequate access to onsite uses.***

Access points to the commercial and employment areas have not yet been designated or designed. Unless adequately addressed in subsequent plans, significant impacts may occur.

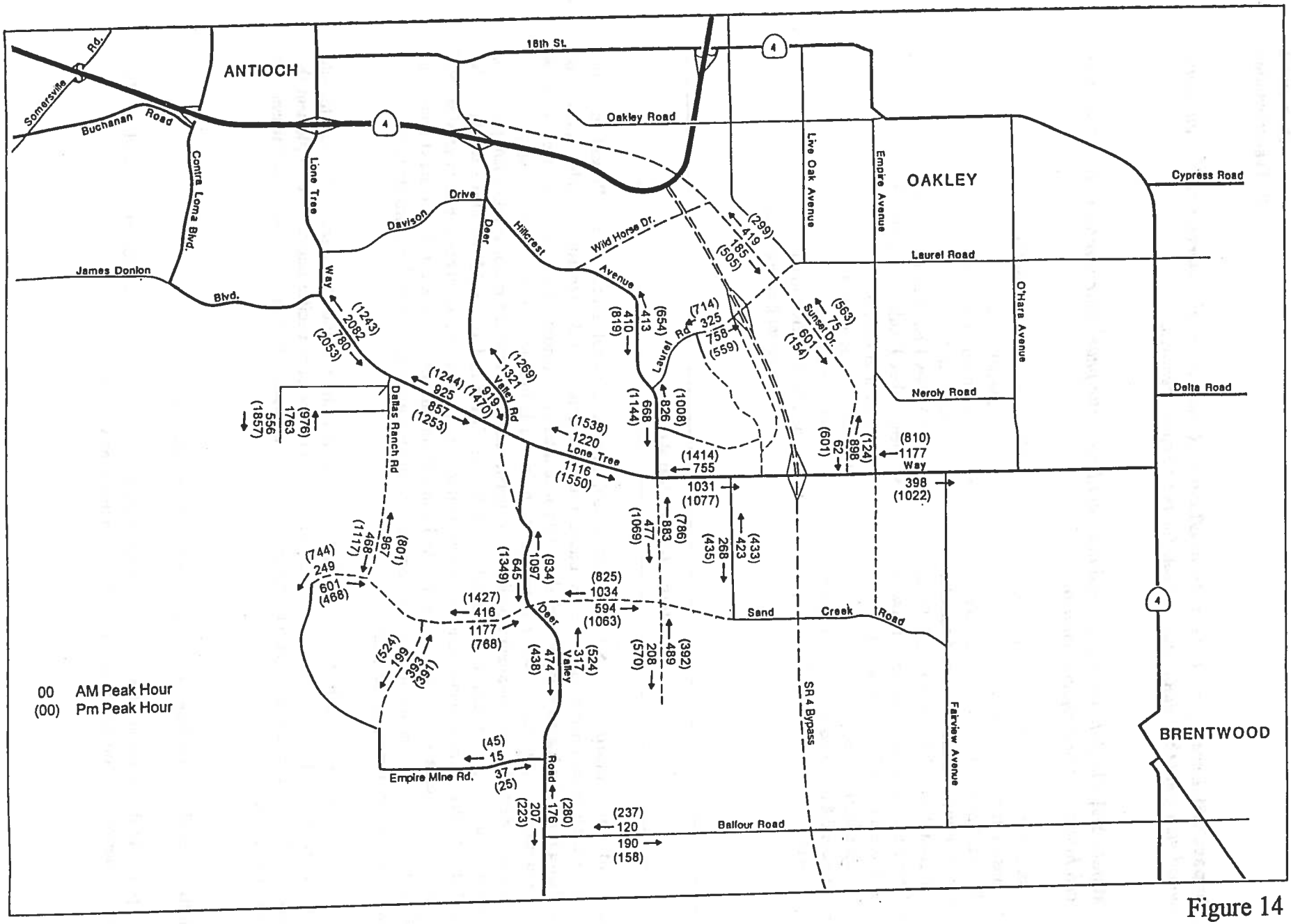
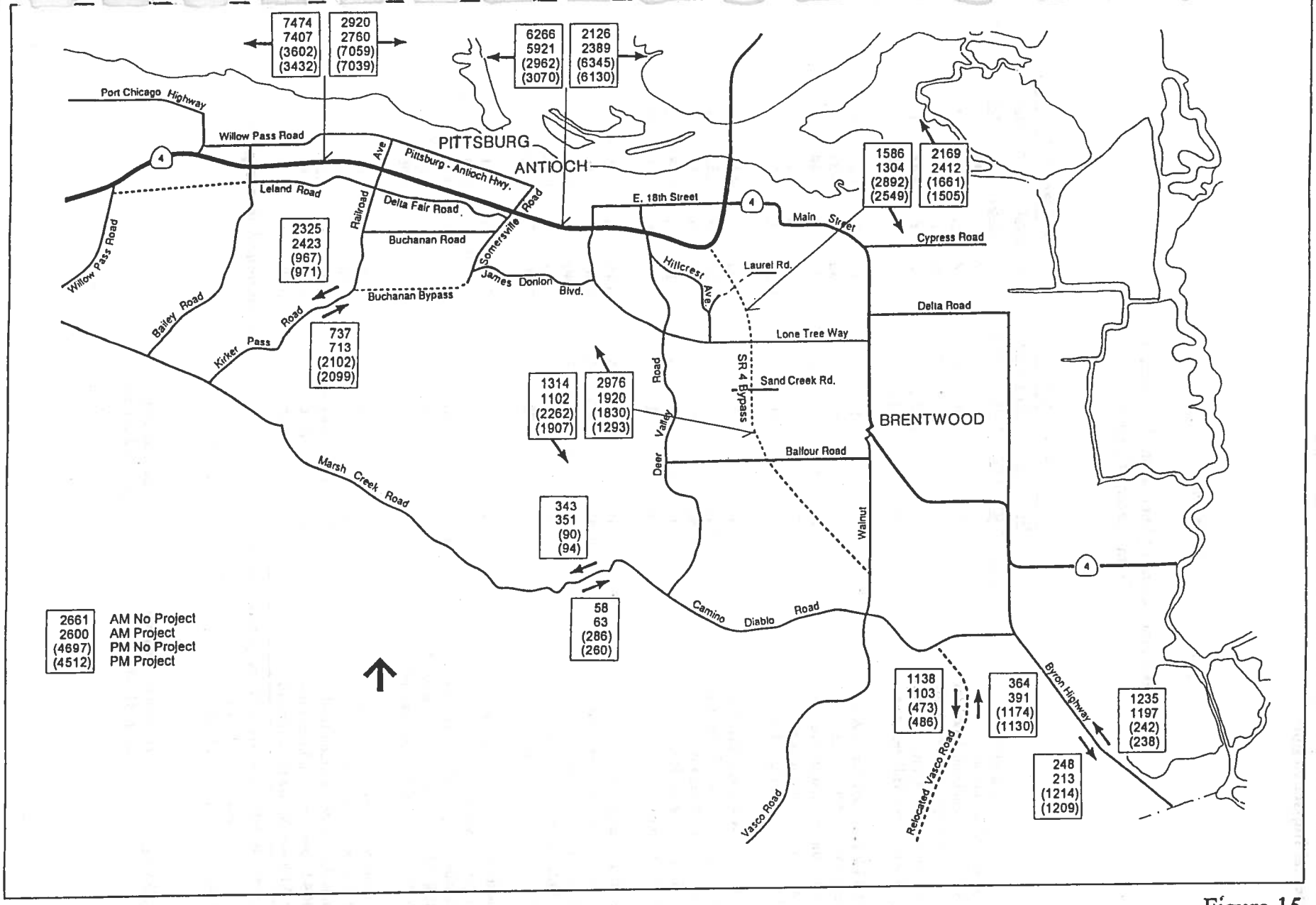


Figure 14

Source: DKS Associates

Long Term (Recent Trends) with Plan Buildout Local Traffic Volumes

Future Urbanization Area #2 Specific Plan EIR



Source: DKS Associates

Figure 15

Long Term (Recent Trends) with/without Plan Buildout Regional Traffic Volumes

Future Urbanization Area #2 Specific Plan EIR

Table 16

Peak Hour Levels of Service and V/C Ratios
Long Term (Recent Trends)

		AM Peak Hour				PM Peak Hour			
		No Project		With Project		No Project		With Project	
Intersection	Control	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
1 Somersville/Buchanan	s	0.43	A	0.40	A	0.48	A	0.46	A
2 SR 4 WB Ramps/Lone Tree Way	s	1.00	E	0.99	E	0.68	B	0.70	B
3 SR 4 EB Ramps/Lone Tree Way	s	0.69	B	0.75	C	0.99	E	**1.11**	F
4 Dallas Ranch Rd./Lone Tree Way	u	0.72	C	**1.13**	F	1.02	F	**1.41**	F
5 SR 4 WB Ramps/Hillcrest Ave.	u	1.07	F	**1.14**	F	0.98	E	0.98	E
6 SR 4 EB Ramps/Hillcrest Ave.	u	1.02	F	**1.17**	F	1.54	F	**1.62**	F
7 Deer Valley Rd./Hillcrest Ave.	s	0.49	A	0.56	C	0.80	C	0.85	D
8 Deer Valley Rd./Lone Tree Way	s	0.60	A	0.82	D	0.75	F	**1.08**	F
9 Deer Valley Rd./Balfour Rd.	u	0.27	A	0.22	A	0.37	A	0.27	A
10 Walnut Blvd./Balfour Rd.	s	0.20	A	0.10	A	0.22	A	0.12	A
11 Fairview Ave./Sand Creek Rd.	u	0.34	A	0.18	A	0.30	A	0.20	A
12 Walnut Blvd./Marsh Creek Rd.	s	0.62	B	0.59	A	0.53	A	0.53	A
13 Empire Ave/Laurel Rd.	u	0.88	D	0.85	D	0.76	B	0.68	B
14 O'Hara Ave/Laurel Rd.	s	0.27	A	0.24	A	0.24	A	0.18	A
15 SR 4/Laurel Rd.	u	0.14	A	0.12	A	0.16	A	0.08	A
16 O'Hara Ave/Lone Tree Way	u	0.45	A	0.41	A	0.45	A	0.39	A
17 Fairview Ave/Lone Tree Way	s	0.45	A	0.47	A	0.70	B	0.56	A
18 SR 4/Lone Tree Way	s	0.33	A	0.28	A	0.40	A	0.35	A
19 Hillcrest Ave./Laurel Rd.	s	0.40	A	0.50	A	0.65	B	**0.87**	D
20 Hillcrest Ave/Lone Tree Way	s	0.76	C	0.78	C	0.88	D	**1.02**	F
21 Sand Creek Rd/Lone Tree Way	u	0.32	A	0.70	B	0.45	A	0.81	D
22 Empire Ave/Lone Tree Way	u	0.35	A	0.38	A	0.30	A	0.33	A
23 Canada Valley Rd. /Lone Tree Way	u	0.16	A	0.36	A	0.20	A	0.62	B
24 Hillcrest Ave./New Sand Creek Rd. *	u	-		0.49	A	-		0.63	B
25 Deer Valley Rd./New Sand Creek Rd.*	u	-		0.70	B	-		**1.05**	F
26 Canada Valley Rd./Laurel Rd.	u	0.16	A	0.22	A	0.16	A	0.21	A
27 Sunset Drive/Laurel Rd.*	u	0.50	A	0.55	A	0.46	A	0.65	B
28 Lone Tree Way/J. Donlon Blvd.	s	0.72	C	**0.93**	E	0.93	E	**1.22**	F
29 SR 4 Bypass SB ramp/Laurel Rd.	s	0.34	A	0.68	B	0.53	A	0.55	A
30 SR 4 Bypass NB Ramp/Laurel Rd.	s	0.53	A	0.47	A	0.37	A	0.41	A

* Intersection does not exist in No-project scenarios

† Not an intersection in Phase I

0.90 Denotes a significant impact

(Continued on next page)

Abbreviations: V/C = Volume/capacity ratio; LOS = Level of service; s = signalized control; u = unsignalized control

Table 16

Peak Hour Levels of Service and V/C Ratios
Long Term (Recent Trends) *(Continued)*

		AM Peak Hour				PM Peak Hour			
		No Project		With Project		No Project		With Project	
Intersection	Control	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
31 SR 4 Bypass SB Ramp/Lone Tree Way	s	0.26	A	0.55	A	0.46	A	0.54	A
32 SR 4 Bypass NB Ramp/Lone Tree Way	s	0.37	A	0.45	A	0.26	A	0.51	A
33 SR 4 Bypass/Sand Creek Rd.	s	1.01	F	0.88	D	1.00	E	0.91	E
34 SR 4 Bypass/Balfour Rd.	s	1.44	F	1.22	F	1.38	E	1.00	E
35 Neroly Rd./Laurel Rd.	u	0.08	A	0.06	A	0.11	A	0.08	A
36 Sunset Drive/Wild Horse Rd.	u	0.14	A	0.15	A	0.21	A	0.23	A
37 Sunset Drive/Lone Tree Way	u	0.32	A	0.79	C	0.27	A	0.61	B
38 Empire Avenue/Sand Creek Rd.	u	0.22	A	0.13	A	0.24	A	0.19	A
39 Dallas Ranch /New Sand Creek Rd.*	u	-		**0.90**	D	-		**0.92**	E
40 S. Dallas Ranch Rd./New Sand Creek Rd.*	u	-		0.47	A	-		0.54	A

* Intersection does not exist in No-project scenarios
† Not an intersection in Phase I
0.90 Denotes a significant impact
Abbreviations: V/C = Volume/capacity ratio; LOS = Level of service; s = signalized control; u = unsignalized control

Note: The intersections of Hillcrest Avenue with SR 4 ramps are currently unsignalized, with poor levels of service on minor street approaches. They are shown in this table as if they were signalized in order to facilitate comparison among alternatives.

Source: DKS Associates

(11) [Impact B11] *Designing intersections to serve future development.*

Two new signalized intersections would be required on Lone Tree Way to serve regional commercial land use east of the SR 4 Bypass. The City standard for intersection spacing is 800 feet between signalized intersections on arterials and a minimum of 200 feet for all other intersections.[17] It would not be possible to provide 800-foot spaced signalized intersections on Lone Tree Way at the regional commercial areas. This is due to the planned spacing of the signalized intersections of SR 4 Bypass northbound ramps, Sunset Drive and Empire Road along Lone Tree Way.

(12) [Impact B12] *Meeting street standards.*

The City of Antioch requires the following standards for arterials:

- 100-foot right-of-way
- 12-foot travel lanes
- 16-foot median
- 8-foot bike lanes
- Sidewalks

Antioch's arterial street standards should be followed in design of internal project arterials. All other roadways will

17 Conversation with City of Antioch Public Works staff, April 24, 1995.

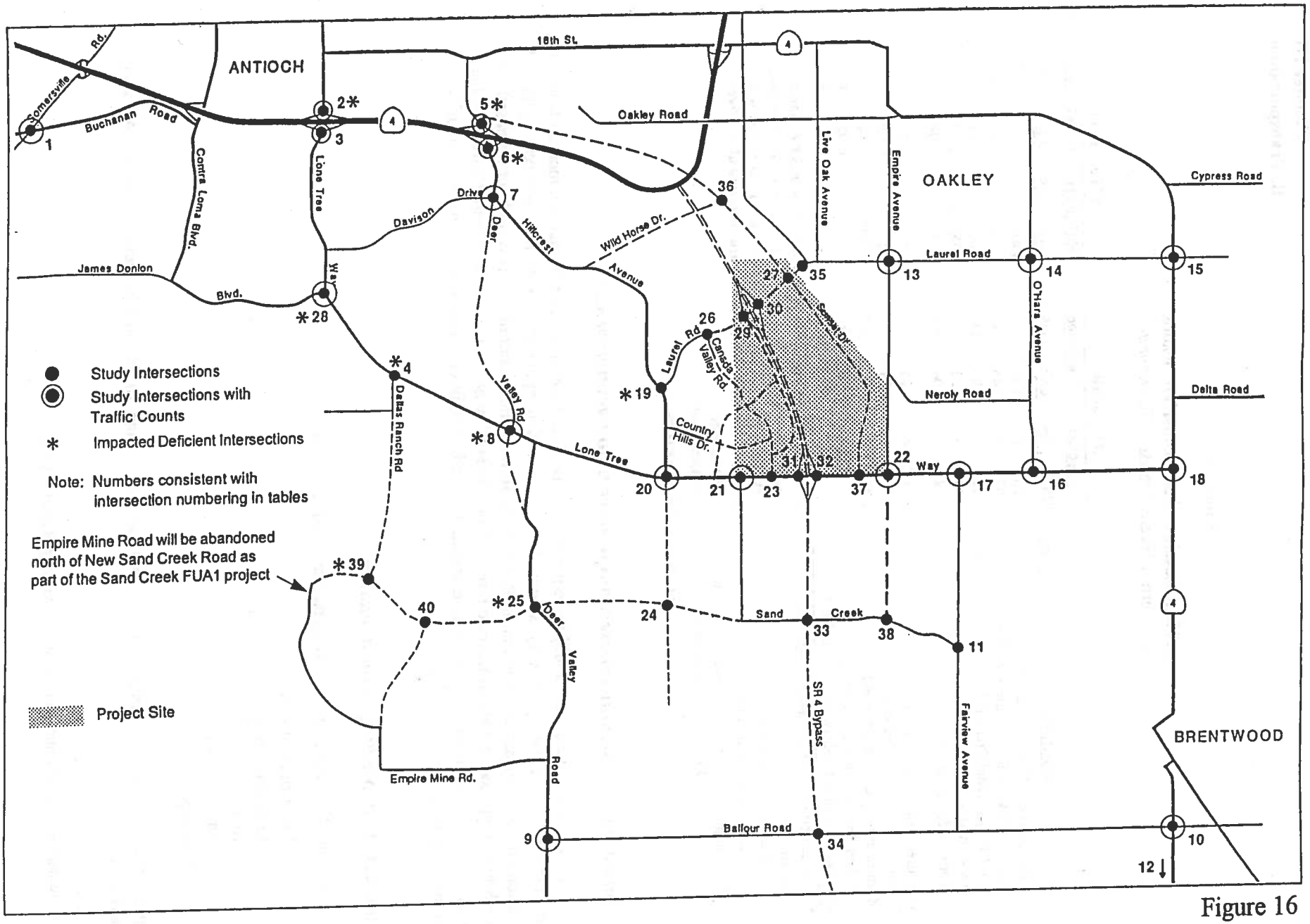


Figure 16

Source: DKS Associates

Long Term (Recent Trends) with Plan Buildout
Study Intersections Significantly Impacted by the Project

Future Urbanization Area #2 Specific Plan EIR

need to be designed to conform to the City's requirements for the Specific Plan area. Compliance with street standards is intended to avoid significant impacts.

(13) [Impact B13] *Providing for pedestrian and bicycle circulation.*

Pedestrian or bicycle paths have not yet been specified for the project. As required by the City, bike lanes and sidewalks will need to be installed on Lone Tree Way, Empire Road and Laurel Road. Sidewalks and bike lanes will need to be included when local roadways within the Project are designed. Unless adequately addressed in subsequent plans this would be a significant impact.

(14) [Impact B14] *Supporting non-automobile circulation.*

The following features have not yet been specified for the project. Unless adequately addressed in subsequent plans, this would be a significant impact.

- bicycle parking in commercial areas
- showers at employment centers for bicycle commuters
- connections to adjacent developments and/or open space

(15) [Impact B15] *Providing for school-related pedestrian circulation.*

One elementary school is planned as part of the Project. Pedestrian access or school crossings have not yet been specified for the schools as part of the Project. Unless adequately addressed in subsequent plans this would be a significant impact.

(16) [Impact B16] *Conforming to public works and fire standards.*

Site planning for the Specific Plan area needs to provide for emergency vehicle access and service delivery facilities. Specific project layout and circulation planning have not yet reached a stage at which compliance with City of Antioch public works and fire standards can be verified. Unless adequately addressed in subsequent plans, this would be a significant impact.

(17) [Impact B17] *Parking provisions.*

Only a general site design has been developed for the Specific Plan, and parking provisions for future uses have therefore not been fully specified. Unless adequately addressed in subsequent site-specific plans, significant impacts may result.

(18) [Impact B18] *Construction-period traffic.*

The project would be constructed in two main phases (several sub-phases) over 10 to 15 years. A construction schedule for the project has not yet been developed. Therefore, specific construction impacts on the study area

network can not be evaluated at this time. Construction period traffic would have a significant impact on area circulation; appropriate mitigation measures should be developed.

(19) **[Impact B19]** ***Supporting use of transit.***

A detailed site plan has not yet been developed, and transit routes and stops have not been identified. Unless adequately addressed in subsequent plans this would be a significant impact.

Project Phasing Impacts

(20) **[Impact B20]** ***Phasing employment and housing development.***

Project impacts outlined above were determined based on the proposed phasing of the project (see Project Phasing, Access and Internal Circulation Assumptions Section). As assumed, construction of project housing and employment would occur at about the same time. If housing is built too far in advance of employment, regional routes such as SR 4 and Vasco Road would experience more traffic in response to residents needing to commute further to jobs. Local intersections would also be expected to be significantly impacted.

Development under the Specific Plan could lead to the 20 potentially-significant effects identified above.

Unless adequately addressed by the following mitigation measures, impacts would be experienced in terms of deficient roadway and intersection operating conditions and internal circulation difficulties (including vehicular access, pedestrian and bicycle circulation, parking, transit and construction effects).

III.B.3 Mitigation Measures

The following mitigation measures are recommended to address potential impacts outlined above. Consistent with the format of the *Impacts* subsection, each *Mitigation Measure* is discussed under one of the development scenario headings; numbered impacts are paired directly with recommended mitigation measures. In each mitigation measure, the proportion of the responsibility for contributing to the Measure that is attributable to FUA #2 is shown in parenthesis. Tables 17a and 17b (pp. 69 to 72) present a summary of FUA #2 contributions to traffic at impacted signalized and unsignalized intersections.

Project Phase I Impacts
Near Term with Year 2005 Growth and Transportation Improvements

Impact B1 The addition of project traffic would worsen deficient conditions at the three intersections of Lone Tree Way and (a) James Donlon Boulevard, (b) Fairview Avenue and (c) Dallas Ranch Road.

Mitigation Measure B1 The following intersection improvements would be needed to mitigate deficient conditions to an acceptable level:

B1a	Lone Tree Way/James Donlon Boulevard	Add 2nd eastbound right-turn lane or channelized "free-right" and 2nd northbound left-turn lane (9%)
B1b	Fairview Avenue/Lone Tree Way	Will operate at acceptable conditions with planned year 2010 widenings (9%)
B1c	Dallas Ranch Road/Lone Tree Way	Add exclusive eastbound right-turn lane (10%)

Impact B2 The project would deteriorate level of service to unacceptable levels at (a) SR 4 eastbound ramps (b) Sunset Drive/Laurel Road and (c) Deer Valley Road/ Lone Tree Way.

Mitigation Measure B2 The following improvements would be needed to mitigate deficient conditions:

B2a	SR 4 eastbound ramps/Lone Tree Way	Add 2nd eastbound right-turn lane or channelized "free-right" (7%)
B2b	Sunset Drive/Laurel Rd.	Add 2nd southbound left-turn lane (56%)
B2c	Deer Valley Rd./Lone Tree Way	Add exclusive eastbound right-turn lane (10%)

Impact B3 The new intersection of Sunset Drive Wild/Horse Drive would operate at unacceptable conditions with project traffic.

Mitigation Measure B3 This intersection will operate at acceptable conditions with planned 2010 widenings (20%).

Impact B4 The five intersections listed in Mitigation Measure B4 currently meet the peak hour signal warrant and would meet the peak hour signal warrant for the Project scenario.

Mitigation Measure B4 Signalize the following intersections:

B4a	Deer Valley Road/Balfour Road	(5%)
B4b	Sand Creek Road/Lone Tree Way	(19%)
B4c	Fairview Avenue/Sand Creek Road	(13%)

B4d	O'Hara Avenue/Lone Tree Way	(5%)
B4e	Empire Avenue/Lone Tree Way	(9%)

Impact B5 The six intersections listed in Mitigation Measure B5 would meet the peak hour signal warrant (in at least one peak hour) for the Project scenario.

Mitigation Measure B5 Signalize the following intersections:

B5a	Sunset Drive/Lone Tree Way	(17%)
B5b	Empire Avenue/Laurel Road	(16%)
B5c	Canada Valley Road/Lone Tree Way	(28%)
B5d	Sunset Drive/Laurel Road	(56%)
B5e	Sunset Drive/Wild Horse Drive	(20%)
B5f	Lone Tree Way/Regional Commercial Driveway	(29%)

Long Term (Recent Trends) Phase II Impacts
with Year 2010 Growth and Transportation Improvements

Impact B6 The addition of project traffic would worsen deficient conditions at the six locations listed in Mitigation Measure B6.

Mitigation Measure B6 The following intersection improvements would be needed to mitigate deficient conditions to an acceptable level:

B6a	SR 4 westbound ramps/Lone Tree Way	Add 2nd northbound left-turn lane (9%)
B6b	SR 4 westbound ramps/Hillcrest Avenue	Add 2nd northbound left-turn lane (15%)
B6c	SR 4 eastbound ramps/Hillcrest Avenue	Channelized "free-right" and exclusive northbound right-turn lane (12%)
B6d	Lone Tree Way/James Donlon Boulevard	Add exclusive eastbound right-turn lane and 2nd northbound left-turn lane (13%)
B6e	Dallas Ranch Road/Lone Tree Way	Add exclusive eastbound right-turn lane and 2nd northbound left-turn lane (13%)
B6f	Hillcrest Avenue/Lone Tree Way	Add exclusive southbound and westbound right-turn lanes (27%)

Impact B7 The five intersections listed in Mitigation Measure B7 would deteriorate to deficient level of service conditions as a result of the Project.

Mitigation Measure B7 The following intersection improvements would be needed to mitigate deficient conditions to an acceptable level:

B7a	Deer Valley Road/New Sand Creek Road	Add exclusive southbound right-turn lane and 2nd eastbound left-turn lane (4%)
B7b	Deer Valley Road/Lone Tree Way	Add exclusive eastbound and northbound right-turn lanes (21%)
B7c	Dallas Ranch Road/New Sand Creek Road	Add 2nd southbound left-turn lane (2%)
B7d	Hillcrest Avenue/Laurel Road	Add exclusive eastbound right-turn lane (41%)
B7e	Dallas Ranch Road/Lone Tree Way	See Mitigation Measure B6 (13%)

Impact B8 The five intersections listed in Mitigation Measure B8 currently meet the peak hour signal warrant and would meet the peak hour signal warrant for the Project scenario.

Mitigation Measure B8 Signalize the following intersections:

B8a	Lone Tree Way/Sand Creek Road	(46%)
B8b	Empire Avenue/Laurel Road	(44%)
B8c	O'Hara Avenue/Lone Tree Way	(28%)
B8d	Sunset Drive/Laurel Road	(31%)
B8e	Dallas Ranch Road/Lone Tree Way	(13%)

Impact B9 The fifteen intersections listed in Mitigation Measure B9 would meet the peak hour signal warrant (in at least one peak hour) for the Project scenario.

Mitigation Measure B9 Signalize the following intersections:

B9a	Deer Valley Road/New Sand Creek Road	(4%)
B9b	Sunset Drive/Lone Tree Way	(15%)
B9c	Canada Valley Road/Lone Tree Way	(50%)
B9d	Dallas Ranch Road/New Sand Creek Road	(2%)
B9e	Hillcrest Avenue/New Sand Creek Road	(5%)
B9f	New Sand Creek Road/Kaiser Driveway	(3%)
B9g	New Sand Creek Rd./Zone 451 Res. Access	(3%)
B9h	New Sand Creek Rd./South Dallas Ranch Road	(3%)
B9i	New Sand Creek Rd./Zone 453 Res. Access	(3%)
B9j	Dallas Ranch Rd./Zone 434 Res. Access	(3%)
B9k	Deer Valley Road/Kaiser Access	(2%)

B9l	Deer Valley Road/Zones 434/455 Res. Access	(4%)
B9m	Hillcrest Avenue/Zones 459/460 Res. Access	(4%)
B9n	Lone Tree Way/Regional Commercial Driveway	(20%)
B9o	Lone Tree Way/Regional Commercial Driveway	(28%)

Internal Circulation

Impact B10	Need for adequate access to onsite commercial and employment areas.
Mitigation Measure B10	Address in subsequent plans in a manner complying with the Specific Plan and with City of Antioch standards.
Impact B11, B12, B13	Need to provide adequate spacing of intersections, roadway widths, sidewalks and bike lanes consistent with City standards.
Mitigation Measure B11 B12 B13	Intersections, roadways, sidewalks and bike lanes will be designed in subsequent plans to meet the City's standards.
Impact B14	Need to provide facilities in support of non-automobile circulation.
Mitigation Measure B14	Address provision of bicycle parking, showers at employment centers and connections to adjacent development in subsequent plans.
Impact B15, B16, B17	Need to provide for site-specific layout and circulation design meeting needs for school-related circulation, delivery access and parking, emergency vehicle access, and user parking.
Mitigation Measure B15 B16 B17	Address school pedestrian access, access for emergency and service vehicles, and parking in subsequent plans.
Impact B18	Project construction traffic will increase traffic and congestion on local roadways and intersections.
Mitigation Measure B18	Develop a detailed construction traffic plan.
Impact B19	Transit routes serving the project and bus stops have not been identified.

Mitigation Measure B19 There are two factors that will improve the transit accessibility of the project:

1. The project should be designed to allow for ready access to arterial and collector streets by pedestrians. This means that cul-de-sacs that back onto arterial and collector streets should have a pedestrian/bicycle link between the cul-de-sac and the main road.
2. Bus turnouts and passenger shelters should be provided on major streets to accommodate future transit service.

Transit routes will need to be addressed in subsequent plans.

Impact B20 Many additional roadways and intersections would be significantly impacted if one phase of the project were built entirely before the other phase (i.e., housing before employment).

Mitigation Measure B20 Implement incentives for employment-bearing land uses to help assure that employment in FUA #2 will be established in the same general time frame as housing.

Implementation of Mitigation Measures B1 through B20 would reduce transportation-related impacts to less-than-significant levels.

Table 17a

Mitigation Summary: Currently Signalized Intersections[a]

Road	At	Impact	Needed Mitigation	FUA #2 "Share"
SR 4 WB Ramps	Lone Tree Way	B6	Add NB left-turn lane	9%
	Hillcrest Ave.	B6	Add NB left-turn lane	15%
SR 4 EB Ramps	Lone Tree Way	B2	Add EB right-turn lane or channelized "free-right"	7%
	Hillcrest Ave.	B6	Channelized "free-right" and exclusive NB right-turn lane	12%
Laurel Road	Hillcrest Ave.	B7	Add EB right-turn lane	41%
Lone Tree Way	James Donlon Blvd.	B1	Add EB right-turn lane or channelized "free-right" and NB left-turn lane	9%
	Fairview Ave.	B1	Year 2010 widenings	9%
	Deer Valley Rd.	B2	Add EB right-turn lane	10%
	James Donlon Blvd.	B6	Add EB right-turn lane and NB left-turn lane	13%
	Hillcrest Ave.	B6	Add SB and WB right-turn lanes	27%
	Deer Valley Rd.	B7	Add EB and NB right-turn lanes	21%

[a] Impacts B1 - B5 are Near Term Phase I Impacts with Year 2000 Growth and Transportation Improvements. Impacts B6 - B9 represent Long Term (Recent Trends) Phase II Impacts with Year 2010 Growth and Transportation Improvements.

Source: DKS Associates

Table 17b

Mitigation Summary:
Non-existing Intersections Requiring Signalization as Mitigation[a]

Impact	Road	Signalize At	FUA #2 "Share"
B4, B5	Wild Horse Drive	Sunset Drive	20%
B5	Laurel Road	Empire Avenue	16%
B2, B5		Sunset Drive	56%
B8		Empire Avenue	44%
B8		Sunset Drive	31%
B9	Hillcrest Avenue	Zones 459/460 Residential Access	4%
B9		New Sand Creek Road	5%
B1	Lone Tree Way	Dallas Ranch Road	10%
B4		Sand Creek Road	19%
B4		O'Hara Avenue	5%
B4		Empire Avenue	9%
B5		Sunset Drive	17%
B5		Canada Valley Road	28%
B5		Regional Commercial Use Driveway	29%
B8		Sand Creek Road	46%
B8		O'Hara Avenue	28%
B6, B7, B8		Dallas Ranch Road	13%
B9		Sunset Drive	15%
B9		Canada Valley Road	50%
B9		Regional Commercial Use Driveway	20%
B9		Regional Commercial Use Driveway	28%
B7, B9	New Sand Creek Road	Deer Valley Road	4%
B7, B9		Dallas Ranch Road	2%
B9		Kaiser Driveway	3%
B9		Zones 451 Residential Access	3%
B9		South Dallas Ranch Road	3%
B9		Zones 453 Residential Access	3%
B4	Deer Valley Road	Balfour Road	5%
B9		Kaiser Access	2%
B9		Zones 434/455 Residential Access	4%
B9	Dallas Ranch Road	Zone 434 Residential Access	3%
B4	Fairview Avenue	Sand Creek Road	13%

[a] Impacts B1 - B5 are Near Term Phase I Impacts with Year 2000 Growth and Transportation Improvements. Impacts B6 - B9 represent Long Term (Recent Trends) Phase II Impacts with Year 2010 Growth and Transportation Improvements.

Source: DKS Associates

III.C AIR QUALITY[18]

The *Antioch Infrastructure Plan* and its *Environmental Impact Report* (Mundie & Associates, 1992) evaluated the air quality impacts of multiple development scenarios within Future Urbanization Areas #1 and #2 in southeast Antioch.

The FUA #2 Specific Plan and its proposed land use program is consistent with the development scenarios analyzed in the *Infrastructure Plan* and *EIR*. For this reason, the earlier analysis remains applicable to the present project and is relied upon below to set the stage for the mitigation measures.

III.C.1 Setting

a. Local Climatology, Air Pollutants and Ambient Standards. The *Infrastructure Plan* EIR provides a thorough review of local climatic conditions and describes their effect on air quality in the Antioch area. It also reviews critical air pollutants (describing their sources and effects on health and property) and summarizes the governmental standards that apply to each pollutant. For a detailed presentation of these issues, see the *Air Quality* section of that report (pp. 147-148).

b. Air Pollutant Sources. Antioch contains a multitude of criteria pollutant sources. The combustion of fuel for space and water heating, industrial processes and commercial uses is one such pollutant source. The evaporation of fuels and solvents, incineration, fires, and pesticide use are other examples of typical pollutant sources. The largest single source of pollutants is vehicles.

Antioch also contains some large point sources of pollutants such as the Pacific Gas and Electric generating plant and a facility operated by Du Pont. The location of the study area is removed from these and other stationary pollutant sources.

The Bay Area inventory identified 19 sources of toxic air contaminants (TACs) within or near Antioch., Three of these were identified as a high priority sites and required to prepare a health risk assessment; however, none of Antioch's 19 identified sources of TACs are located near the Specific Plan area.

c. Current Air Quality. The closest air quality monitoring site operated by BAAQMD is located in nearby Pittsburg. A summary of air quality data from the Pittsburg monitoring site is shown in Table 18 (p. 77) for the years 1987 through 1992. The table shows that the federal ambient air quality standards for criteria pollutants are generally met, but that concentrations of ozone have exceeded the more stringent state standard except in 1991. Concentrations of PM-10, although not measured in Pittsburg, also exceed the state standard in most of the Bay Area.

d. Clean Air Plan. The *Bay Area '91 Clean Air Plan* (CAP) is the air quality plan for the Bay Area that was mandated by the California Clean Air Act. The *Plan* contains numerous control measures for stationary and mobile sources as well as transportation control measures (TCMs) designed to reduce automobile emissions in the region.

The *Bay Area '91 Clean Air Plan* forecasts continued improvement in regional air quality. An analysis of carbon monoxide trends shows attainment of the standards throughout the Bay Area by the mid-1990s. However, implementation of the *Clean Air Plan* would not provide for attainment of the state ozone standard even by the year 2000.

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18 Analysis of air quality impacts in the *Infrastructure Plan* EIR was undertaken by Donald Ballanti. This section was prepared by Mundie & Associates on the basis of that earlier work.

Table 18

Summary of Air Quality Data for Pittsburg, 1987-1992

		Days Exceeding Standard in Year					
Criteria Pollutants	Standard	1987	1988	1989	1990	1991	1992
Ozone	Fed. 1-Hour	2	0	0	0	0	0
Ozone	State 1-Hour	14	8	5	4	0	3
Carbon Monoxide	Fed. 8-Hour	0	0	0	0	0	0
Nitrogen Dioxide	State 1-Hour	0	0	0	0	0	0
Sulphur Dioxide	Fed. 24-Hour	0	0	0	0	0	0

Source: California Air Resources Board, California Air Quality Data, Annual Summary, Vols. XIX-XXIV, 1988-1992.

e. Antioch General Plan Policies. The *Antioch General Plan* contains an air quality goal that is intended to maintain and enhance the air quality of the community. Of the several policies supporting the goal, one specifically addresses large, new residential and non-residential projects. Air Quality Policy 7 states that the city should require developers to participate in programs and take measures that would improve traffic flows and/or reduce vehicle trips, resulting in decreased vehicular air pollutant emissions. The following strategies are identified:

- ❒ Provision of transit improvements and amenities, including dedicated bus turnouts and sufficient rights-of-way for transit vehicle movement, bus shelters along transit routes and pedestrian access to transit from walled development.
- ❒ Provision of bicycle and pedestrian facilities, including bicycle lanes and pedestrian walkways connecting residential areas with neighborhood commercial centers, recreational facilities, and schools and other public areas.
- ❒ Contribution of off-site mitigation, including one-time in-lieu fees to local transit districts that could be used for maintenance and/or upgrade of transit vehicles and for support of ridesharing programs.
- ❒ Requirements for industrial and commercial tenants to participate in a ridesharing program that would include preferred carpool parking, discounted transit passes and on-site sale of transit passes, as well as participation in alternative work scheduling that would include staggered work hours and job-sharing.

III.C.2 Impacts

a. Significance Criteria. Guidelines issued by the Bay Area Air Quality Management District (BAAQMD) for the evaluation of project impacts, consider emission increases for regional pollutants to be significant if they exceed 150 pounds per day. Buildout of the Specific Plan would exceed the threshold by several times over. Estimates that a project would lead to exceedances of state or federal ambient air quality standards would also constitute a significant adverse impact.

b. Effects Found to be Less than Significant. The following impact of the Specific Plan would occur, but would not exceed the threshold of significance.

Concentrations of carbon monoxide (CO) would increase under development in the planning area, especially near major roadway intersections. This impact would be less than significant because the project would not be expected to exceed state or federal ambient air quality standards. The 1992 *Infrastructure Plan EIR* (p. 153) demonstrated that CO concentrations would generally increase as a result of increased automobile traffic with buildout of Antioch's Future Urbanization Areas, but not exceed state or federal standards.

c. Effects Found to be Potentially Significant. Two effects of the Specific Plan would be potentially significant.

(1) **[Impact C1]** ***Regional air quality standards would be exceeded.***

BAAQMD's established standards for criteria air pollutants – daily emissions in excess of 150 pounds per day of ROG, NOx, SO2 and PM-10 – would be exceeded.

The level of development envisioned in the Specific Plan would result in emissions of criteria pollutants in excess of regional thresholds.

(2) **[Impact C2]** ***Fugitive dust would be generated during the construction period.***

During the construction period of new development allowed by the Specific Plan, air pollutants of several types would be generated. Organic gas emissions from solvents in adhesives, non-water-based paints, thinners and caulking materials would evaporate and add to the photochemical reaction that creates ozone. Construction vehicles and equipment would also emit air pollutants, though in volumes that are not considered significant when compared with vehicular exhaust emissions on the local roadway network. Fugitive dust is the most important construction period air pollutant. It is mostly created during demolition, clearing and grading activities, but can result from wind erosion over exposed earth surfaces at any time. The highest potential for fugitive dust to create a nuisance occurs on days that are both dry and windy.

Construction of Phase I of the project would not result in substantial problems associated with dustfall in the early stages of development, as the planning area is largely undeveloped and there are few sensitive receptors in the vicinity of the site. However, once initial phases are completed and construction occurs on subsequent phases, the residents and employees at employment uses could experience construction period dust that would rise to a level that would be considered significant.

The project would create construction period dust after initial phases. It would also contribute to the violation of regional emissions standards, a significant impact in subsequent phases.

III.C.3 Mitigation Measures

Mitigation measures would include compliance with air quality policies of the Antioch General Plan and implementation of Antioch's Transportation Demand Management Ordinance.

Impact C1 Regional air quality standards would be exceeded.

Mitigation Measure C1a The proposed project shall comply with the air quality policies of the *Antioch General Plan*.

The project shall demonstrate compliance with the General Plan by ensuring that the local circulation system will encourage and accommodate the use of transportation modes other than the automobile.

Mitigation Measure C1b Implement Antioch's Transportation Demand Management ordinance.

The Transportation Demand Management Ordinance (TDM) shall be applied to all phases of the proposed project and include specific trip reduction goals and enforcement procedures. The available strategies for meeting the TDM goals should include, but not be limited to, the following:

- ☐ Incentives to use public transit
- ☐ Ridesharing
- ☐ Cycling and walking
- ☐ Alternative work hours
- ☐ Parking management
- ☐ Transportation coordination at job sites
- ☐ Transit terminal/transfer station
- ☐ New transit routes
- ☐ Provision of transit amenities

Impact C2 Fugitive dust would be generated during the construction period.

Mitigation Measure C2 Control construction period fugitive dust in all phases of project development beyond the initial phase. Controls shall include the following:

- ☐ Provide equipment and staffing for watering of all exposed or disturbed soil as required by the City.
- ☐ Water or cover stockpiles of debris, soil, sand or other materials that can be blown by the wind.
- ☐ Sweep construction areas and adjacent streets of all mud and debris, since this material can be pulverized and later resuspended by vehicle traffic.
- ☐ Limit the speed of all construction vehicles to 15 miles per hour while on site.
- ☐ Suspend earthmoving and other dust-producing activities during periods of high winds.

The adoption of mitigations C1a and C1b would have the potential to reduce regional impacts of the project by 10 to 15 percent. These measures encompass all feasible mitigation measures for regional air quality impacts. However, even with the reductions created by these mitigation measures, regional emission increases would still be considered a significant unavoidable impact for project buildout.

Implementation of mitigation C2 would reduce the potential short term nuisance of construction dust to a less-than-significant level.

III.D NOISE[19]

III.D.1 Setting

a. Existing Noise Conditions. The study area was visited on October 22, 1993 and six 15-minute noise measurements were taken. Weather during the visit was good. Figure 17 presents measurement locations (numbered 1 through 6). The measurements were taken along local streets in the vicinity of the planning area that would potentially carry project traffic. The results of the measurements are summarized in Table 19.

Intermittent residences front the streets in the vicinity of the project. The noise measurements show that traffic on local streets is the major noise source in the area. Another potentially significant noise source in the area is the Southern Pacific Railroad. The train tracks run along the west side of Neroly Road.

Noise measurements show that traffic on Empire Avenue, Lone Tree Way and Neroly Road generates the highest noise levels in the area. All measurements were taken 50 feet from the centerline of the roadway. Table 19 shows the average noise level (L_{eq}), the maximum and minimum noise levels, and the noise levels exceeded 1%, 10%, 50% and 90% of the measurement period. An estimate of the 24-hour average noise level (CNEL) is also shown in the table based on the measured data and traffic data available for these roadways. Based on the results of the measurements, existing residences along Lone Tree Way are exposed to CNEL noise levels of about 70 dBA. Residences along Empire Avenue and Neroly Road are exposed to noise levels up to a CNEL of 66 dBA. Residences fronting Live Oak Avenue and Laurel Road are currently exposed to noise levels ranging between a CNEL of 55 to 60 dBA. The noise environment in the area is typical of a rural setting.

b. Regulatory Background

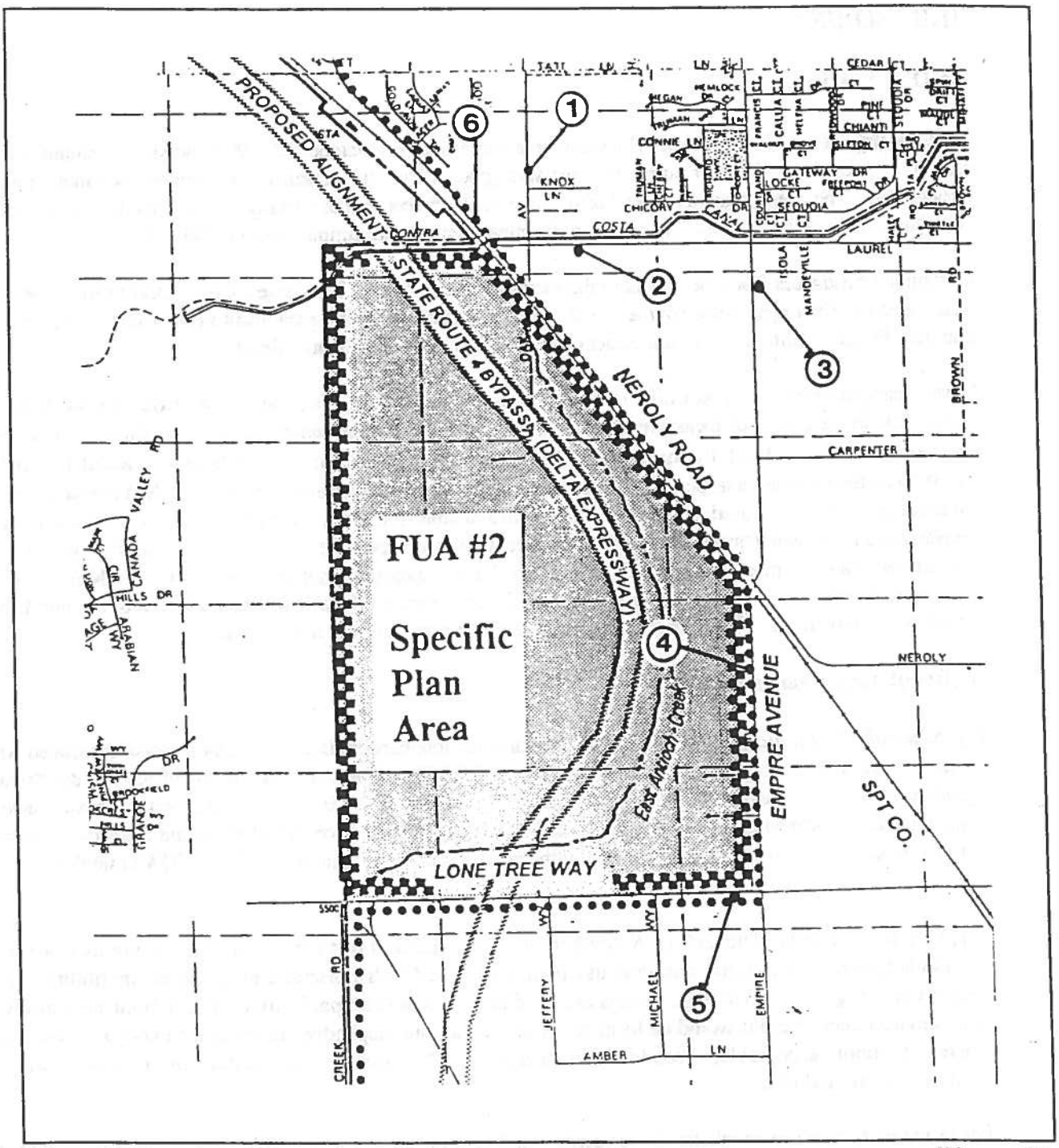
(1) State of California. There are no state laws directly applicable in the assessment of noise associated with new projects. The California Environmental Quality Act (CEQA) includes qualitative guidelines for determining the significance of adverse environmental noise impacts. According to CEQA, "a project will normally have a significant effect on the environment if it will: (a) conflict with adopted environmental plans and goals of the community where it is located; or (b) increase substantially the noise levels for adjoining areas." (CEQA Guidelines, Appendix G).

(2) City of Antioch. The City of Antioch, in its Noise Element of the General Plan, contains goals, policies and guidelines related to noise and land use planning. The City's noise and land use compatibility guidelines are shown in Figure 18. These guidelines are used to assess the compatibility of a particular land use with the noise environment where it would be located. A particular site, depending on its noise exposure, could be considered "normally acceptable," "conditionally acceptable," "normally unacceptable" or "clearly unacceptable" for a particular land use.

For example, low density single-family residential land uses are shown in the table to be "normally acceptable" for sites exposed to noise levels below 60 L_{dn}, "conditionally acceptable" when exposed to noise levels between 55 and 70 L_{dn}, "normally unacceptable" when exposed to noise levels between 70 and 75 L_{dn} and "clearly unacceptable" when exposed to noise levels above 75 L_{dn}.

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19 Background information, analysis of impacts, recommendation of mitigation measures and draft graphics for the *Noise* section have been prepared by Illingworth & Rodkin, Acoustical Engineers.



Source: Illingworth & Rodkin

Figure 17

Noise Monitoring Locations

Future Urbanization Area #2 Specific Plan EIR

Table 19

Existing Noise Levels
(Measured October 22, 1993)

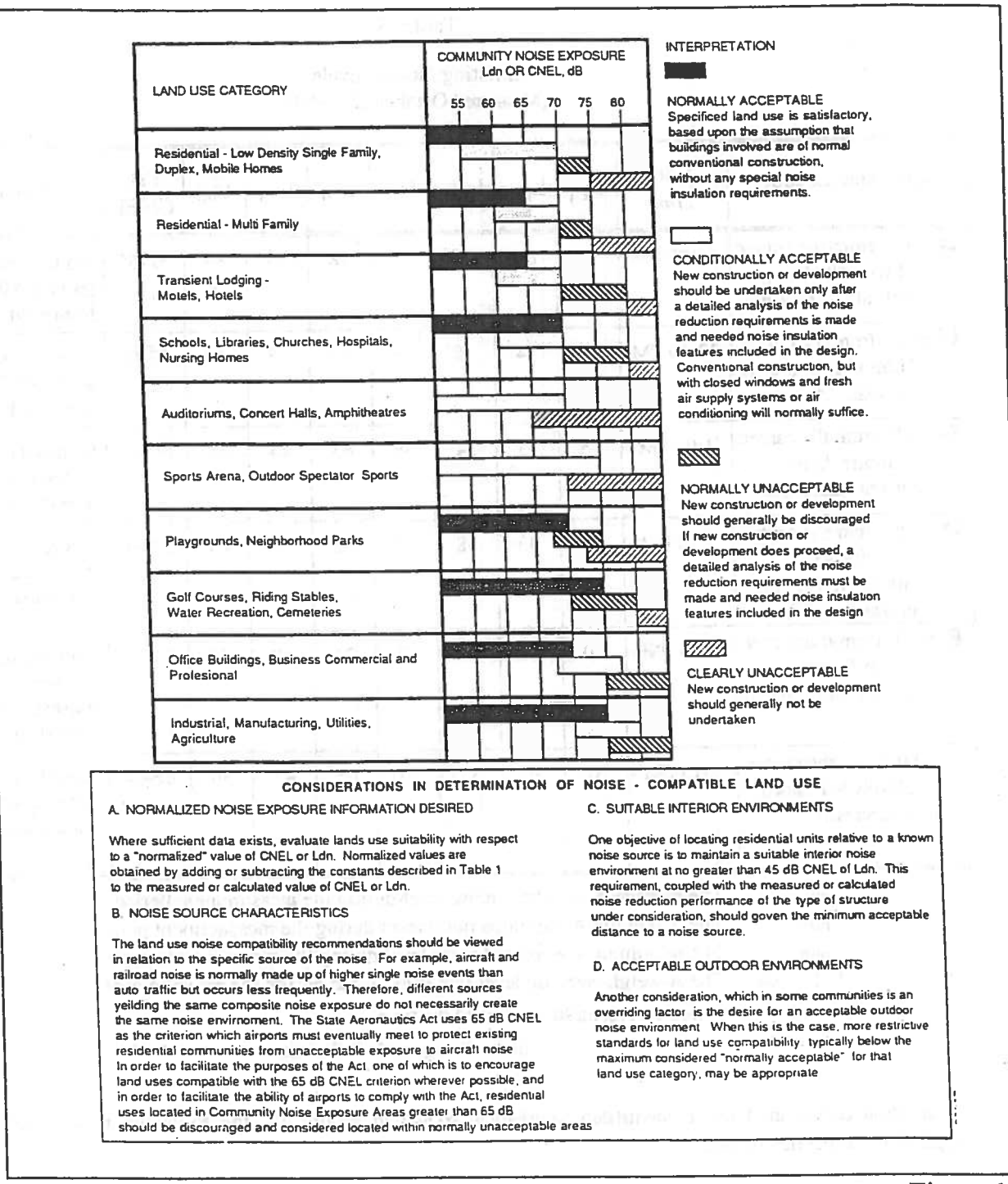
Monitoring Location	*Start Time*	L_{eq}	L_{max}	L_{min}	L_{01}	L_{10}	L_{50}	L_{90}	Est. CNEL	Comments
❶ 50 ft. from the center of Live Oak Ave.; north of Laurel Rd.	12:20 PM	51	69	35	67	48	50	39	52-55	Scattered residences set back 50-200 ft. from road.
❷ 50 ft. from the center of Laurel Rd.; east of Live Oak Ave.	12:40 PM	57	74	38	69	60	45	40	57-60	Several residences set back 50-200 ft. from road.
❸ 50 ft. from the center of Empire Ave.; south of Laurel Rd.	1:00 PM	58	73	34	69	63	44	36	59-62	Scattered residences set back 50-200 ft. from road.
❹ 50 ft. from the center of Empire Ave.; south of Neroly Rd. and train tracks.	1:20 PM	63	80	38	74	68	56	44	64-66	Few homes along the road at 100-200 ft. setbacks.
❺ 50 ft. from the center of Lone Tree Way; west of Empire Ave.	1:45 PM	70	78	48	77	74	68	56	71-72	Scattered residences and new subdivisions at 100-200 ft. from road.
❻ 50 ft. from the center of Neroly Rd.; north of Laurel Rd.	2:15 PM	62	76	33	73	66	45	36	62-64	Scattered residences and new subdivisions adjacent to the road.

L_{eq} The average A-weighted noise level during the measurement period.
L_{max} The maximum A-weighted noise level during the measurement period.
L_{min} The minimum A-weighted noise level during the measurement period.
L_{01} - L_{90} The A-weighted noise level that is exceeded during the measurement period 1 percent/90 percent of the time.

Source: Illingworth & Rodkin

In addition to the land use compatibility guidelines shown in Figure 18, the following noise policies are also applicable for the this project:

Policy 7 states that, "the impact of point sources of noise should be minimized. In many cases, this can be accomplished by limiting the hours of operation of such sources to the daytime (7 AM to 7 PM) when the community will tolerate higher noise levels."



Source: Antioch General Plan 1988-2000, Appendix C

Figure 18

Land Use Compatibility for Community Noise Environments

Future Urbanization Area #2 Specific Plan EIR

Policy 8 addresses effective noise mitigation and states that, "the city should consider the use of noise barriers to mitigate noise problems that cannot be reduced at their source. Masonry walls are the most common form of sound barrier, but more natural and aesthetically pleasing barriers such as dense vegetation combined with berms may also be effective."

Policy 9 deals with interior noise regarding noise sensitive land uses and states that, "The California Noise Insulation Standards (Title 25) should be enforced by the Building Services Department. Single-family and multi-family dwellings, hotels and motels located within 60-CNEL contours require an acoustical analysis showing interior levels will not exceed 45-CNEL. (CNEL and L_{dn} may be considered equivalent). This should be submitted as early in the design review process as possible, preferably prior to finalization of plans and submittal of development applications."

Policy 11 establishes an upper noise limit for primary outdoor use areas of residential uses by stating that "the background ambient noise level for outdoor living areas, defined as backyards for single-family homes and patios for multi-family units, shall not exceed 60 CNEL."

III.D.2 Impacts

a. Significance Criteria. The goals and policies contained in the Noise Element of the City of Antioch's General Plan are discussed above. Project noise impacts would be considered significant under the following conditions:

- If noise resulting from the proposed project increases average ambient noise levels (CNEL) at a sensitive receptor by more than 3 dBA and the resulting noise level would be above the applicable acceptability level (e.g., 60 dBA CNEL for residences).
- If project-generated noise resulted in a 5 dBA increase in the CNEL and the resulting level remained below the maximum considered normally acceptable.
- If land uses would be exposed to CNEL noise levels exceeding levels considered normally acceptable in the Noise Element of the Antioch General Plan.

Noise resulting from construction activities would cause a significant adverse impact upon sensitive receptors if noise levels exceeded 60 dBA L_{eq} during the daytime outside a residence or school, or 55 dBA L_{eq} during the nighttime outside a residence and also exceeded the ambient noise level.

b. Effects Found to be Less than Significant. Several effects of development allowed under the Specific Plan would occur, but would not exceed the thresholds of significance outlined above. One key consideration is the potential increase in traffic noise along local streets in the area resulting from project generated traffic.

Over the long-term, traffic generated by the proposed project would not substantially increase noise levels at residences adjoining the major access roads for the Specific Plan area. Existing residences adjoin the roadways which, in the future, would carry project-generated traffic. These roadways include Lone Tree Way, Empire Avenue, Neroly Road and Laurel Road. Residential subdivisions are being built west of the planning area. The SR 4 Bypass is planned to go through the FUA #2 area and will result in changes in traffic volumes along local streets.

Traffic noise level increases were assessed by comparing future traffic volumes, assuming that the Sand Creek Specific Plan and FUA #2 Specific Plan areas are developed and the SR 4 Bypass is constructed, with what noise levels would be like in the year 2000 if the Specific Plan areas are not developed and the SR 4 Bypass not constructed. Noise levels along Laurel Road, Lone Tree Way and Neroly Road would be within 1 decibel of each other, an insignificant difference. Along Empire Avenue, north of Lone Tree Way, noise levels would actually be lower in the future with the development of the proposed project than without them because traffic would be diverted onto the Delta Expressway. Noise levels along local roads overall would not be perceptibly different with or without development in the FUA #2 Specific Plan area.

c. Effects Found to be Potentially Significant. The primary noise-related issue resulting from the proposed urbanization of the FUA #2 is the effect of noise from the proposed SR 4 Bypass on proposed residential land uses and other noise sensitive development. Short-term noise impacts resulting from construction activities could also affect existing and future residents of the area.

(1) **[Impact D1]** ***Project construction would result in high levels of construction noise.***

During the buildout of the Specific Plan, construction noise levels would intermittently exceed 60 dBA Leq at existing and future sensitive receptors. Construction noise levels would substantially exceed existing and future ambient noise levels.

Construction of the roads and structures would involve grading and utility work, foundation and building erection activities and paving and would occur over many years. The noise of construction would become a part of the ambient noise environment within the planning area. Construction activities would involve the use of hammers, saws, nail guns, graders, scrapers, front loaders, pavers, trucks and other ancillary equipment associated with construction. Trucks would also deliver and remove materials from the site. The use of heavy impulsive tools, such as pile drivers, are not typically required for the types of development proposed. Average construction noise levels for various phases of construction for different types of developments are shown in Table 20. During busy construction periods, average construction noise levels could exceed 60 dBA within 500-1,000 feet of the construction site, causing a significant impact to existing or future residents located within that zone. Nighttime construction is not typically required for the development of a specific plan area such as this and is not anticipated for this project.

(2) **[Impact D2]** ***Residential noise exposures may exceed standards.***

The Specific Plan includes residential developments where noise exposure could exceed 60 dBA CNEL due to vehicular traffic on the planned SR 4 Bypass and local streets. The future noise exposure within the Specific Plan area will be substantially different than it is today. This is primarily due to the planned SR 4 Bypass which will pass through the planning area generally from north to south.

The noise environment will also change as a result of the development of the area with noise sources including local traffic, neighborhood noise and other noise sources typical of an urbanized area. The compatibility of the proposed residential development with the noise environment must therefore be assessed with respect to the future conditions.

The environmental noise impacts resulting from the SR 4 Bypass were assessed in the *Delta Expressway Project Draft Environmental Impact Report* [20]. The noise level 100 feet from the centerline of the nearest lanes of the bypass is predicted to be 76 dBA north of Laurel Road and 75 dBA south of Laurel Road within the FUA #2 planning area.

20 State Route 4 Bypass Project Draft Environmental Impact Report, Vol. 3 – State Route 4 Bypass Project, October 1993. Prepared by ESA.

If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in building design (per the City's Noise Element). Between the 60 dB and 70 dB contours the noise environment is considered "conditionally acceptable" and further studies and mitigation measures are again recommended. The 60 dB noise contour line depicts the limit where residential land uses are compatible without additional studies.

Table 20

Typical Noise Levels at Construction Sites

	Domestic Housing		Office, Hotel, Hospital, School, Public Works		Industrial, Parking, Amusement & Recreation, Store, Service Station		Public Works, Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	83	84	84
Excavation	88	75	89	79	89	71	88	78
Foundations	81	81	78	78	77	77	88	88
Erection	81	65	87	75	84	72	79	78
Finishing	88	72	89	75	89	74	84	84

Notes: I = All pertinent equipment present at site; II = Minimum required equipment present at site.

Source: Illingworth & Rodkin

Taking into consideration the factors that are described in the inset box to the right, and using data supplied in the *Delta Expressway Project Draft EIR*, a noise contour map was developed for the project site (see Figure 19). The contours depict the community noise equivalent level (CNEL) for the area in the year 2010.

Land uses proposed along the east side of the SR 4 Bypass are not generally sensitive to noise. The range of noise levels from about 75 dBA at the right-of-way down to approximately 60 dBA in the eastern areas of the site would be compatible with the proposed land uses. However, on the west side of the roadway proposed land uses include residential development. Here, the noise environments would be considered "normally unacceptable" for any residential development between the proposed expressway and the 70 dB contour.

Noise Attenuation with Distance and Terrain

Noise levels drop off with distance from a roadway. If there is no excess attenuation of the noise due to absorption by the ground or the atmosphere, noise levels drop off at the rate of about 3 dBA with a doubling of distance from the source. Over flat terrain where the ground is not covered with asphalt or concrete, there is excess attenuation resulting in an overall attenuation rate of 4 to 5 dBA with every doubling of the distance from the source. In upsloping situations, such as to the west of the planned Delta Expressway, the ground absorption is not significant so the 3 dBA per doubling of distance attenuation rate is recommended. There is additional attenuation beyond distances of 1,000 feet due to absorption of the sound waves by the atmosphere. This varies considerably but can be approximated at about 1 dBA per 1,000 feet beyond a distance of 1,000 feet.

During construction activities, noise levels would exceed 60 dBA at sensitive receptors, a significant adverse impact. Once constructed, residential development near the SR 4 Bypass and other local streets would also be exposed to noise levels exceeding 60 dBA, a potentially significant adverse impact in light of City Noise Element standards.

III.D.3 Mitigation Measures

Impact D1 Project construction would result in high levels of construction noise.

Mitigation Measure D1a Limit hours of noise-generating construction activity.

Noise-generating construction equipment, including truck traffic to and from the site for any purpose, should be limited to the hours of 8:00 AM to 5:00 PM. Trucks should be restricted to major arterial roadways and should avoid residential neighborhoods when possible.

Mitigation Measure D1b Minimize equipment noise.

All construction equipment shall be properly muffled and maintained.

Mitigation Measure D1c Protect sensitive receptors from excessive construction noise.

All stationary noise-generating construction equipment, such as air compressors, should be located as far as practical from residences. Such equipment, when near occupied residences, should be acoustically shielded where possible using wood screens or other available barriers such as construction trailers. "Quiet" construction equipment, particularly air compressors, shall be selected whenever possible. The prudent selection of such equipment, along with the use of proper mufflers, should result in maximum construction-related noise generated by a particular piece of equipment or no more than 85 dBA when measured at a distance of 50 feet from a piece of equipment operating at its noisiest mode.

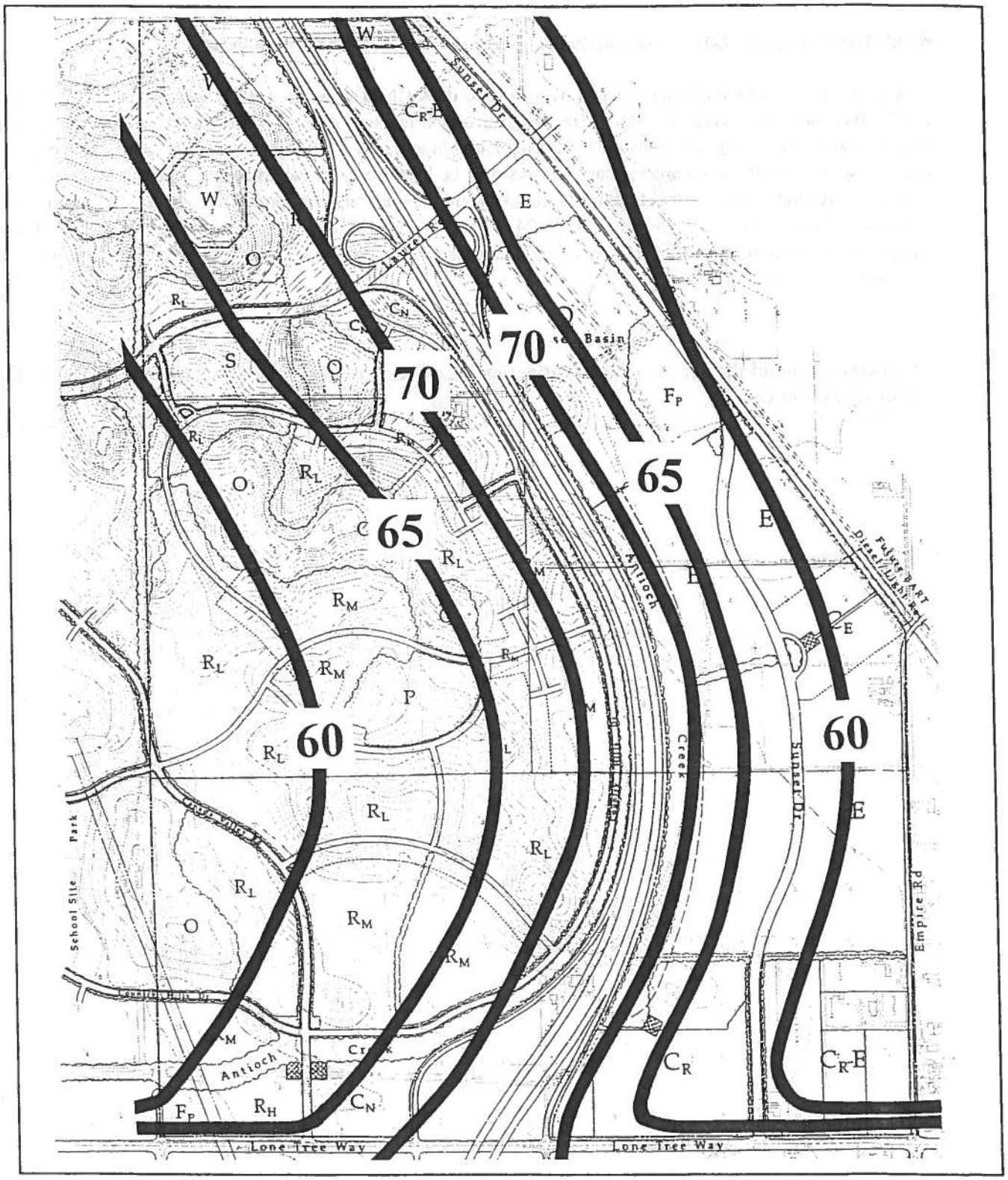
Impact D2 Potential for excessive traffic noise at new sensitive receptors.

Traffic noise within the Specific Plan area could exceed applicable guidelines at new residential receptors.

Mitigation Measure D2a Achieve CNEL of 60 dBA or less.

A combination of open space buffer zones and/or noise barriers along roadways could be used to reduce the CNEL to 60 dBA or less.

The specific heights and limits of noise barriers or open space buffer zones cannot be determined until a site plan is developed for each portion of the Specific Plan area. Figure 19 shows the largest (worst-case) open space buffer zones required in order to mitigate noise levels in outdoor activity areas without any additional attenuation due to topography or noise barriers. As a general guideline, a 6-foot high barrier would be required to provide the 5 dBA of noise reduction necessary at the 65 dBA contour and a 10-12 foot high barrier would be required at the 70 dBA contour.



Source: Illingworth & Rodkin

Figure 19

Year 2010 CNEL Noise Contours
Without Mitigation

Future Urbanization Area #2 Specific Plan EIR

Mitigation Measure D2b Site and design residences to meet interior noise standards.

All single- and multi-family housing located within the 60 dBA CNEL contour shall be designed such that the indoor CNEL level shall not exceed 45 dBA. The designs for the housing shall be reviewed by a qualified acoustical engineer and the necessary noise control treatments incorporated into the design. All such units shall be provided with forced air ventilation systems so that windows may be kept closed at the discretion of the occupants for noise control. Additional noise control treatments could include sound rated windows and doors. A report shall be prepared following the requirements of Title 24, Part 2 of the California Administrative Code for all multi-family housing within the 60 CNEL contour distances. A similar report shall be provided for single-family housing to the City of Antioch

Implementation of the recommended mitigation measures would reduce any adverse impacts to less than significant levels.

III.E GEOLOGY, SOILS AND SEISMICITY[21]

III.E.1 Setting

a. Introduction. This section summarizes existing geological and soil conditions within the study area and evaluates existing and potential geological hazards for the project. As with most of the topical analyses in Chapter III, it builds on environmental research and analysis undertaken for the *Infrastructure Plan EIR*.

Because the description of the area's geological, soil and seismic characteristics remains mostly unchanged, this *Setting* subsection does not reiterate all of the information provided in the earlier EIR; the information presented in the *Infrastructure Plan EIR* remains operative except where revised in the text presented below. The following *Setting* section represents conditions about which one or more of the following can be said: (a) the conditions have changed since the earlier work was completed; (b) one or more regulatory changes have taken place since the earlier work was completed; (c) subsequent research has clarified our understanding of a resource or hazard; (d) the earlier work has been revised or corrected in some way to insure accuracy.

b. Site Geology. The hills on the western portion of the study area are developed on bedrock of the poorly consolidated Miocene (5 to 24 million years old) Neroly Formation and Pliocene (2 to 3 million years old) Wolfskill Formation (Figure 20). The bedrock units dip (are inclined) at relatively shallow angles to the north-northeast. The Neroly Formation consists of a relatively resistant marine sandstone with minor layers of shale, mudstone and conglomerate. The Wolfskill Formation consists of non-marine shale, mudstone, sandstone and pebble conglomerate. The eastern and southern portions of the site consist of Holocene (less than 11,000 years old) alluvial sediments. The alluvial sediments consist of interlayered and unconsolidated clay, sand, silt and gravel. The thickness of the alluvium is unknown, but has been estimated to be over 100 feet deep along the eastern project boundary.[22]

Artificial fill has been placed in three areas in the northern portion of the study area. Two of the filled areas consist of five to ten feet of soil excavated from the East Antioch Creek Extension channel and detention basin. The third fill area is located next to the Oakley Water District water storage tank and consists of up to 20 feet of soil and rock excavated during grading of the water tank pad. It is unknown whether any of the filled areas were properly compacted.[23] However, this part of the site would not be affected by development proposed under the Specific Plan.

c. Soils. The soil types within the project, mapped by the U.S. Soil Conservation Service, consist of Capay Clay and Rincon Clay Loam in the valley areas and Diablo Series Clays in the hills (Figure 21). The characteristics of these soil types are summarized in Table 21. In general, these soils have low strength, slow permeability, high shrink-swell potential and high corrosivity.

The erosion potential of soils (when exposed) that are located on the hills ranges from low to high, increasing with the steepness of the hill slope. The valley soils are generally more favorable for crop production than the Diablo Series soils developed on the hills based on the Storie Index for each of the soil units.[24]

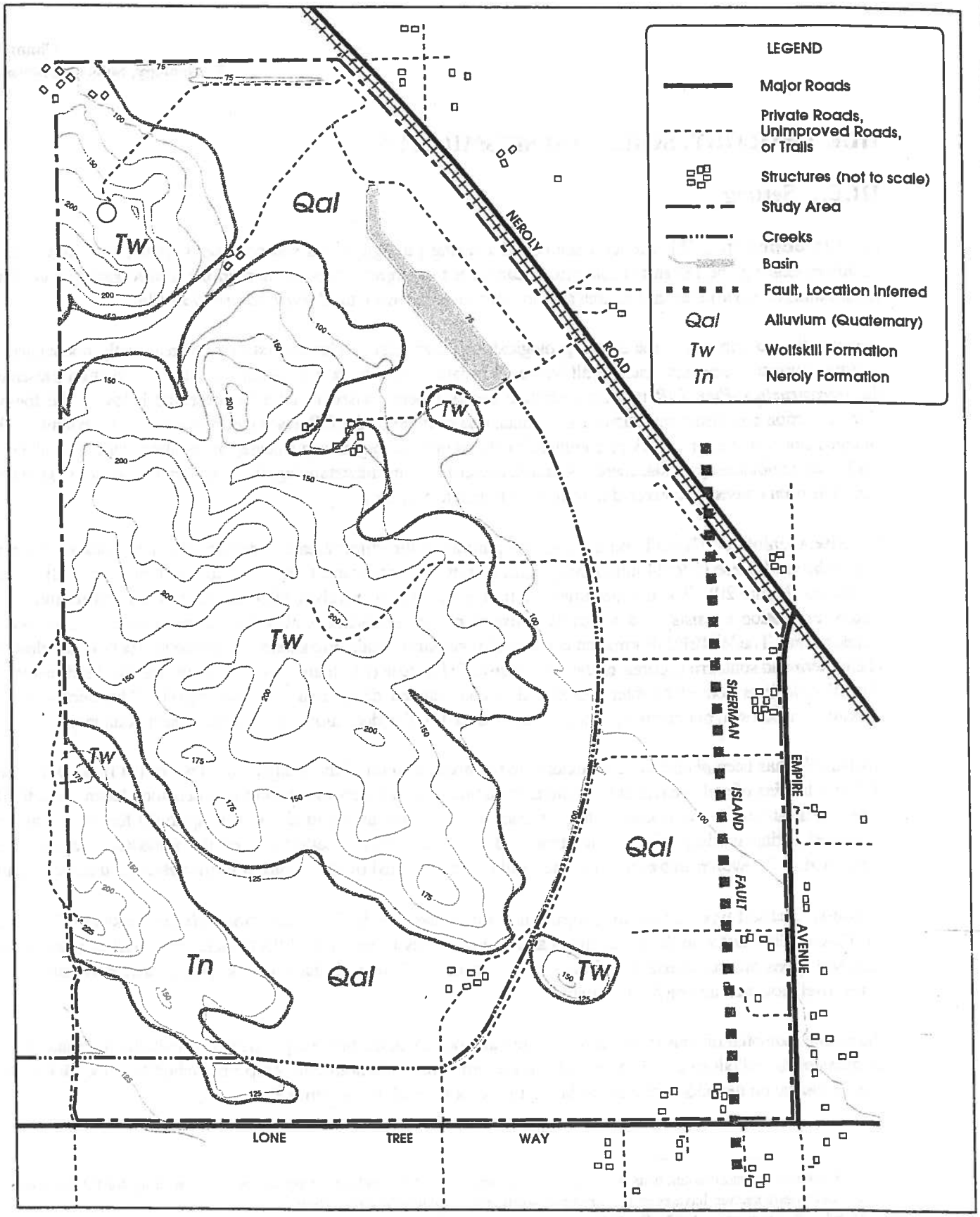
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21 Background information, analysis of impacts, recommendation of mitigation measures and draft graphics for the *Geology, Soils and Seismicity* section have been prepared by Baseline Environmental Consulting.

22 Mundie & Associates, 1992, *Draft Environmental Impact Report on the Antioch Infrastructure Plan, Antioch, California*, June.

23 Ibid.

24 The Storie Index expresses numerically the relative degree of suitability of a soil for general intensive farming as it is practiced at the time of evaluation, and is based on soil depth, surface texture, subsoil characteristics, drainage, salt content, and relief.

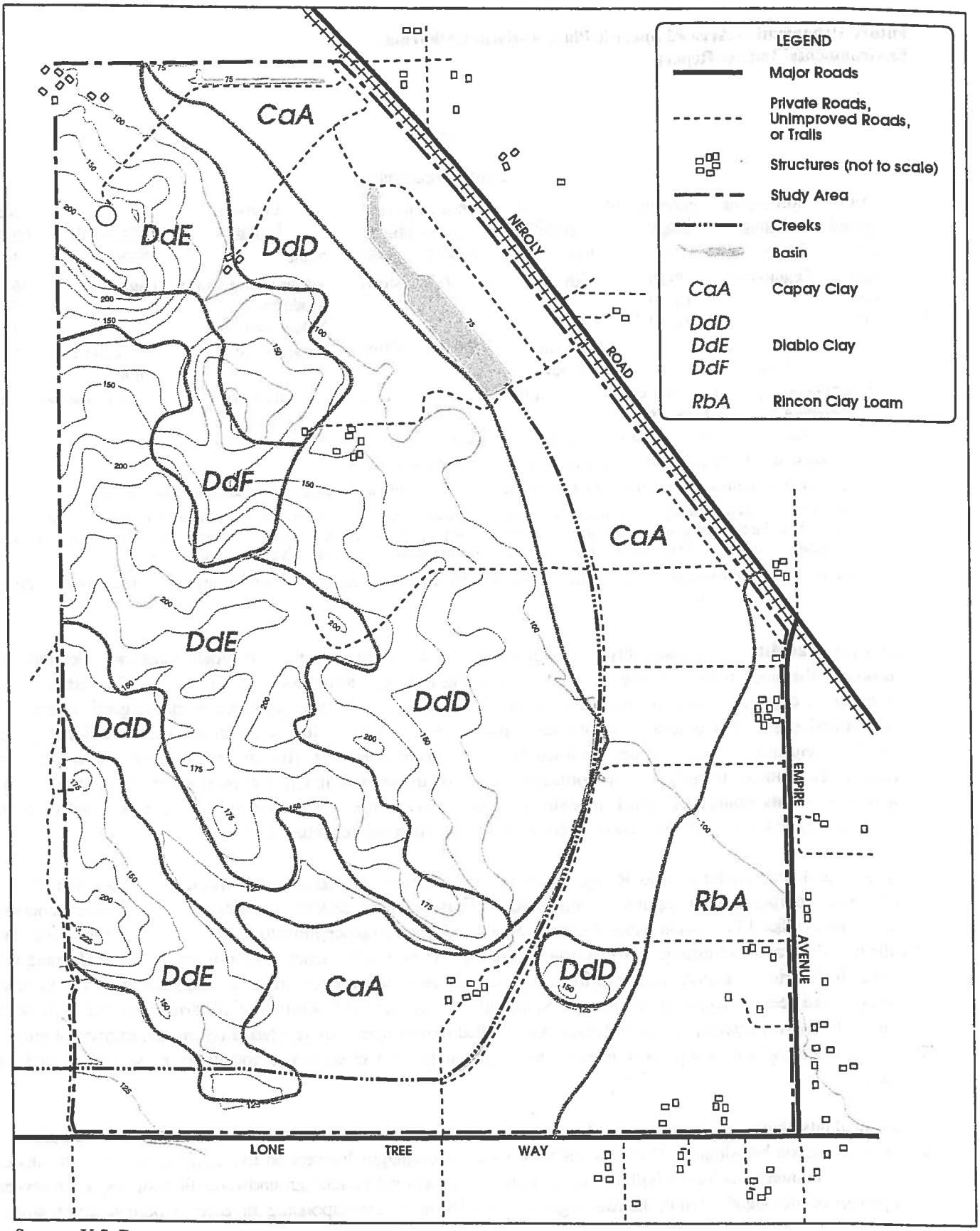


Source: Modified from Brabb, E., Sonneman, H., and Switzer, J., 1971, Preliminary Geologic Map of the Mount Diablo - Byron Area, Contra Costa, Alameda, and San Joaquin Counties, California

Figure 20

Geology

0 500 1000 2000



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

Figure 21

Soil Types

0 500 1000 2000

Antioch Future Urbanization Area #2 EIR

Table 21

Soil Characteristics

Map Symbol	Soil Series Name	Percent Slope	Shrink/Swell Potential[a]	Permeability[b] (inches/hour)	Erosion Hazard[c]	Corrosivity[d]	Storie Index[e]
CaA	Capay Clay	0-2	High	0.06-0.2 (slow)	None	High	54
DdD	Diablo Clay	9-15	High	0.06-0.2 (slow)	Slight to Moderate	High	36
DdE		15-30			Moderate		27
DdF		30-50			Moderate to High		17
RbA	Rincon Clay Loam	0-2	Moderate to High	0.06-0.2 (slow)	None to Slight	Moderate to High	68

[a] Shrink-swell potential is the extent to which the soil shrinks as it dries or swells when wet. A high shrink-swell rating indicates a hazard to structures.

[b] Permeability is the ability of a soil to transmit air or water.

[c] Erosion hazard is the propensity of a soil to erode when tilled or exposed.

[d] Corrosivity pertains to the potential for soil-induced chemical action that dissolves or weakens uncoated steel.

[e] The Storie Index expresses numerically the relative degree of suitability of a soil for general intensive farming as it is practiced at the time of evaluation and is based on soil depth, surface texture, subsoil characteristics, drainage, salt content and relief. A rating of 100 percent expresses the most favorable or ideal condition for crop production.

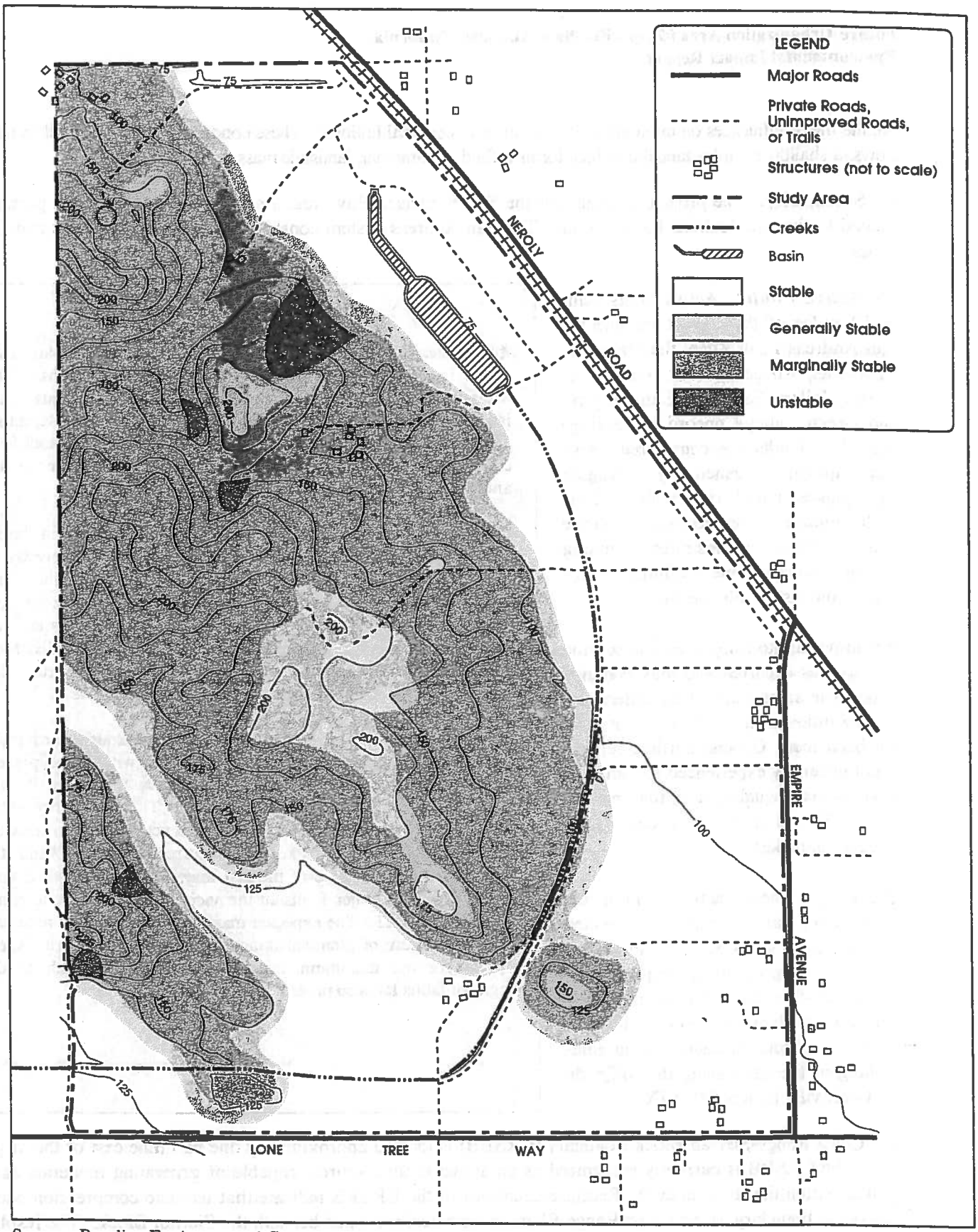
Source: U.S. Department of Agriculture, Soil Conservation Service, 1977, Soil Survey of Contra Costa County.

d. Slope Stability. Slope stability is predominantly controlled by the type of bedrock underlying the slope, the direction of the slope relative to the dip of the underlying rock, the steepness of the slope and the thickness and distribution of colluvial soils which mantle the slope. The portions of the project located on flat to gentle slopes have been mapped as stable or generally stable with respect to slope failure. Most of the areas that have slopes greater than 15 percent are considered generally stable to marginally stable. A portion of the southern hill at the site is considered moderately unstable. The northeastern side of the central hill has been mapped as unstable, being underlain by or immediately adjacent to landslide deposits (see Figure 22).[25] This observation is based on large-scale mapping, and is subject to revision based on more detailed onsite reconnaissance.

Slopes in and around the Diablo Range which are underlain by fine-grained sedimentary bedrock (shales and siltstones) are particularly susceptible to slope failure. Thus, slopes underlain by relatively fine-grained sedimentary rocks of the Wolfskill Formation within the study area could be more susceptible to slope failure than areas underlain by the coarser-grained sandstone of the Neroly Formation. However, evidence of significant recent landsliding was not identified during a reconnaissance of the site. Small, shallow rotational failures, or soil slips, were identified on slopes that had been overly steepened along road cuts and stream banks. Operation of all-terrain vehicles in the steep terrain of the northwestern portion of the site has resulted in destruction of vegetative cover, disturbance of surface soils and rutting which significantly increase the potential for soil erosion and potentially present slope stability hazards.

A potential unstable slope condition could exist in area of the site where thick colluvial deposits have accumulated in shallow swales on hill slopes. These swales form incipient drainage channels on the upper portions of the slopes. The swales, known as colluvial hollows, concentrate runoff and subsurface groundwater flow during storm events and periods of prolonged rainfall. Increased groundwater levels and corresponding increases in pore water pressure

25 Nilsen, T.H. and Wright, R.H., 1979, *Relative Slope Stability and Land-Use Planning*, U.S. Geological Survey Professional paper 944.



Source: Baseline Environmental Consulting

Figure 22

Slope Stability

0 500 1000 2000

Antioch Future Urbanization Area #2 EIR

are the major influences on initiation of debris flows in colluvial hollows. These conditions typically result in debris flows, a shallow complex landslide which forms a fluid, fast-moving landslide mass.

e. Seismicity. The project is located in the San Francisco Bay area, a seismically active region primarily related to the San Andreas Fault system. The San Andreas system consists of several major faults and fault zones.

1) Active Faults. Active faults within 50 miles of the project include the San Andreas Fault Zone, the Hayward, Calaveras, Rodgers Creek, Greenville, Corral Hollow, Seal Cove-San Gregorio and Green Valley-Concord faults (Figure 23). Faults are considered active and capable of generating damaging earthquakes based on either historic fault rupture or on geologic evidence that clearly demonstrates faulting during Holocene time (within approximately the last 11,000 years).

It is important to emphasize that seismic activity has occurred and may continue to occur in areas where these criteria for the definition of an "active" fault have not been met. Ground surface rupture is not generally experienced for small to moderate earthquakes (less than magnitude 5.0) and may not occur during large earthquakes.

The closest known active fault is the Greenville Fault which is located roughly eight miles west of the study area. Two moderate earthquakes (of magnitude 5.4 and 5.8) occurred along this fault in January 1980. The estimated maximum intensity for groundshaking at the site during the MCE on the Greenville fault is MMI IX.

Seismic Terminology

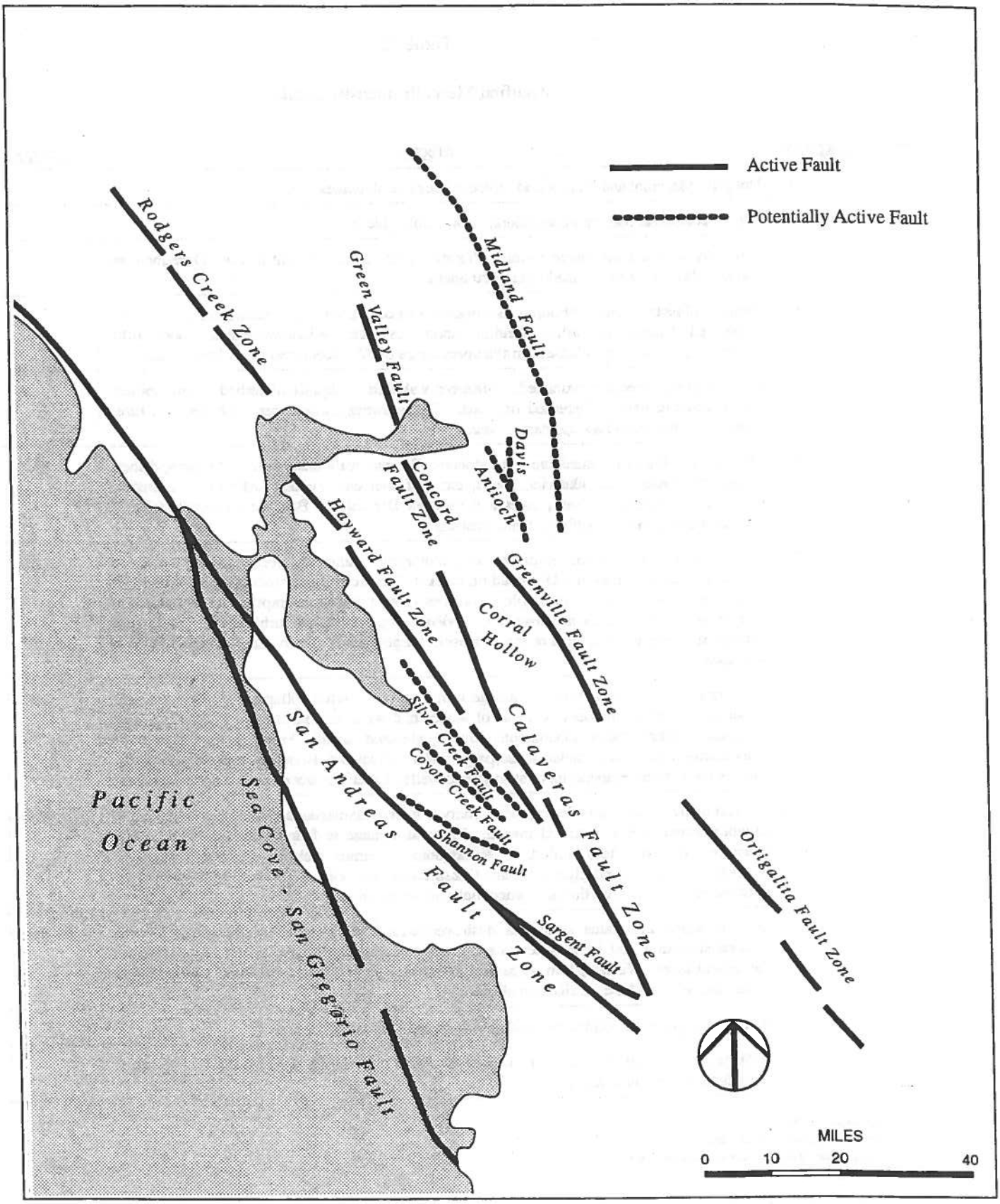
Magnitude. The total energy released at the epicenter of an earthquake is measured by motion recorded by seismographs. This measurement is referred to as the ***magnitude*** of the earthquake and is generally expressed with reference to the Richter Magnitude Scale. The Richter Magnitude Scale is logarithmic and each successively higher magnitude reflects a 32-fold increase in the amount of energy released by an earthquake.

Intensity. Ground motion is strongest at the epicenter and diminishes with distance away from the epicenter. The severity of ground shaking at any particular point is referred to as the earthquake ***intensity***. The earthquake intensity is a subjective measure of the effects of ground shaking on people, structures and earth materials. Intensity is generally expressed by the Modified Mercalli Intensity (MMI) Scale. A description of the parameters that define the Modified Mercalli Scale is presented in Table 22.

Maximum Credible Earthquake. The maximum earthquake which can reasonably be expected to occur within the present geologic framework along a fault is typically referred to as the ***maximum credible earthquake*** (MCE). The probability of an earthquake occurring along a fault is a function of the estimated interval between earthquakes, or recurrence interval, and the known or estimated date of the last major earthquake. The estimated MCE for major faults in the vicinity of the study area are listed in Table 23. The expected maximum peak ground accelerations, a measure of groundshaking, and maximum intensity at the project for the maximum credible earthquake on each of the regional faults are also presented in Table 23.

The Coast Range-Sierran Block Boundary (CRSBB) is located approximately one half mile east of the project site. The CRSBB is currently recognized as an active seismic source, capable of generating moderate earthquakes within the study area.[26] Recent evaluations of the CRSBB indicate that tectonic compression occurs across the boundary as the Coast Range Block is tectonically pushed beneath the Sierran Block. The result of this active compression is the development of folds and thrust faults within the CRSBB zone. The faults

26 Wong and others, 1988.



Source: Baseline Environmental Consulting based on ABAG, 1983 and CDMG, 1983

Figure 23

Regional Faults

Antioch Future Urbanization Area #2 EIR

Table 22

Modified Mercalli Intensity Scale

Intensity		Effects	v,[2] cm/s	g[3]
M[4]	I.	Not felt. Marginal and long-period effects of large earthquakes.		
3	II.	Felt by persons at rest, on upper floors, or favorably placed.		
	III.	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.		0.0035-0.007
4	IV.	Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV wooden walls and frame creak.		0.007-0.0
	V.	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.	1-3	0.015-0.0
5	VI.	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked. Bells ring (church, school). Trees, bushes shaken (visibly, or heard rustling).	3-7	0.035-0.0
6	VII.	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in masonry C. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.	7-20	0.07-0.15
	VIII.	Steering of motor cars affected. Damage to masonry C; partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and steep slopes.	20-60	0.15-0.3
7	IX.	General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. (General damage to foundations - CFR.) Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluviated areas sand and mud ejected, earthquake foundations, sand craters.	60-200	0.35-0.7
8	X.	Most masonry and frame structures destroyed with their foundations. some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted on beaches and flat land. Rails bent slightly.	200-500	0.7-1.2
	XI.	Rails bent greatly. Underground pipelines completely out of service.		>1.2
	XII.	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.		

[1] From Richter (1958).
[2] Average peak ground velocity, cm/s.
[3] Average peak acceleration (away from source).
[4] Richter magnitude correlation.

Note: *Masonry A, B, C, D.* To avoid ambiguity of language, the quality of masonry, brick or otherwise, is specified by the following lettering (which has no connection with the conventional Class A, B, C construction).

Masonry A: Good workmanship, mortar, and design, reinforced, especially laterally, and bound together by using steel, concrete, etc; designed to resist lateral forces.

Masonry B: Good workmanship and mortar, reinforced, but not designed to resist lateral forces.

Masonry C: Ordinary workmanship and mortar; no extreme weaknesses such as non-tied-in corners, but masonry is neither reinforced nor designed against horizontal forces.

Masonry D: Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally

Table 23

Major Faults Affecting the Study Area

Fault	Approximate Distance from Project Area (miles)	Maximum Credible Earthquake[a,b] (M_L)	Recurrence Interval[c] (years)	Expected Maximum Peak Ground Acceleration During MCE[d] (g)	Expected Ground Shaking Intensity at the Site (MMI)
ACTIVE					
Calaveras	19	7.5	150	0.21	VIII
Coast Range-Sierran Block Boundary Zone	0.5	7.0	N/A	0.63	IX
Concord-Green Valley	17	6.5	319	0.13	VII
Corral Hollow	20	6.5[e]	N/A	0.08	VII
Greenville	8	7.25	424	0.34	VIII
Hayward	28	7.5	336	0.15	VII-VIII
Rodgers Creek	38	7.0	270	0.08	VI-VII
San Andreas	47	8.0	300	0.14	VII
Seal Cove-San Gregorio	48	7.5	824	0.05	VI
POTENTIALLY ACTIVE					
Antioch/Davis	1.5	6.75	N/A	0.55	IX
Livermore	18	6.2	N/A	0.08	VII
Las Positas	23	6.3[e]	872	0.06	VI
Midway	17	6.3[e]	2,651	0.08	VII

[a] The maximum credible earthquake (MCE) is the largest earthquake expected under the present geologic framework.

[b] Estimated magnitude of MCE from Mualchin and Jones (1992) except where noted.

[c] Recurrence interval, or repeat time, is the estimated interval of time between maximum credible earthquakes (Wesnousky,1986).

[d] Expected maximum peak ground accelerations are based on seismic shaking attenuation curves presented in Mualchin and Jones (1992).

[e] Estimated magnitude from Wesnousky (1986).

Note: N/A = Not available

Source: Baseline Environmental Consulting

associated with the CRSBB zone do not typically propagate to the surface and are, therefore, called "blind thrusts". Because the faults are not expressed at the surface, identification of the locations of the faults cannot, typically, be determined on the basis of geomorphic evidence. However, the compressional zone is considered capable of generating moderate to large earthquakes which could produce strong groundshaking throughout the region, including the project site. The 1983 Coalinga earthquake (Magnitude 6.7) is a recent example of an earthquake which occurred on a blind thrust within the CRSBB zone.

The maximum expected earthquake for the CRSBB zone is estimated to be an approximate M 7 event[27] which could occur on numerous known, suspected or unidentified faults within the zone. Wakabayashi and Smith[28] identify distinct segments of the CRSBB zone at the western edge of the Sacramento and San Joaquin Valleys that may be capable of generating M 6 or greater earthquakes. These potential seismic sources include three segments of the CRSBB zone (TS, TN, 7 and 8) identified in the area of project site. The expected maximum earthquakes on these segments range from M 6.0 to M 6.8. The average recurrence interval (i.e., period between characteristic earthquakes within the CRSBB zone) is estimated to be 360-440 years.

The U.S. Geological Survey (USGS) estimates the probability of a large earthquake of magnitude 7 or greater, occurring within the San Francisco Bay area within the next 30 years to be approximately 67 percent.[29] This estimate reflects the combined probability of expected earthquakes on the major fault zones in the Bay area, including the San Andreas, Hayward, Calaveras and Rodgers Creek fault zones. Estimates for the probability of occurrence of MCEs on the Greenville fault and the CRSBB zone, the closest seismic sources to the site, have not been developed.

(2) Potentially Active Faults. Potentially active faults within 20 miles of the project site include Antioch/Davis (a fault zone that is treated as a single entity), Livermore, Los Positas and Midway faults. Faults which are considered to be potentially active do not have known Holocene displacement, but are young with respect to geologic time (evidence of activity in the last two million years) and are considered to be possible earthquake sources.

No known active fault traces cross the project; thus, the potential for fault rupture at the site is low. However, an inferred or concealed trace of the Sherman Island fault traverses the eastern side of the project. Evidence of Holocene fault rupture has not been identified along the Sherman Island fault.[30] The projection of the Sherman Island fault south of Balfour Road is called the Brentwood fault. Evaluations of the Brentwood fault[31] indicate that this fault has experienced fault rupture in Quaternary time and is, therefore, potentially active. Although the relationship of the Sherman Island and Brentwood faults is not accurately known, the tectonic setting suggests that both faults may be potentially active.

The Antioch fault zone (AFZ) is approximately 1.5 miles west of the project site. This fault was previously identified as active under the Alquist-Priolo Special Studies (A-PSSZ) Zones Act (renamed the Alquist-Priolo Earthquake Fault Zoning Act in 1994). The A-PSSZ was removed from the AFZ in 1993 after review of investigations of the fault concluded that there was insufficient evidence to prove Holocene or late Pleistocene activity on the fault.[32] Although the fault is expressed as a shear zone within Tertiary bedrock in the hills north and south of the project site, geomorphic evidence of faulting of late Pleistocene alluvium has not been documented.

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27 Mualchin, L. and Jones, A.L., 1992, Peak Acceleration from Maximum Credible Earthquakes in California (Rock and Stiff-Soil Sites), California Division of Mines and Geology, Open-File Report 92-1, 53 pp. + map.

28 Wakabayashi, J. and Smith, D.L., 1994, Evaluation of Recurrence Intervals, Characteristic Earthquakes, and Slip Rates Associated with Thrusting along the Coast Range-Central Valley Geomorphic Boundary, California, Bulletin of the Seismological Society of America, Vol. 84, No. 6, pp. 1960-1970.

29 USGS, 1990.

30 Atwater, B.I., 1982, Geologic Maps of the Sacramento-San Joaquin Delta, California, U.S. Geological Survey, Miscellaneous Field Studies, MF-1401.

31 Department of Water Resources, 1981, Los Vaqueros Offstream Storage Unit, Engineering Feasibility Report, 127 pp.

32 Wills, C.J., 1992, *The Elusive Antioch Faults,* in Borchardt, Glenn, and others, eds., *Proceedings of the Second Conference on Earthquake Hazards in the Eastern San Francisco Bay Area:* California Department of Conservation, Division of Mines and Geology Special Publication 113, p. 325-331.

Recent trenching along the projected trace of the fault (approximately 1.5 miles southeast of the project site) as it crosses Quaternary alluvium did not identify evidence of recent faulting.[33]

The Antioch and Davis branches present a low, but poorly defined, potential for fault rupture at the project site. They are considered potential seismic sources. The corridor delineated for this system is generalized: fault zones can be diffuse. Geological mapping is a planning-level indicator that does not define conditions at a particular site. Specific site studies are required for that purpose.

f. Mineral Resources. Oil and gas exploration has been conducted within the plan area. Four of nine exploratory wells were developed as natural gas production wells. Three of the wells were abandoned, one remains in operation in the northeastern portion of the site (Figure 26). Other operating wells are located in the Knightsen area to the east of the study area and oil production occurs in the Brentwood Oil Field to the south. Western Continental Operating company holds two oil and gas leases in the southeastern corner of the site. Although the trend in the 1960 to the present has been abandonment of oil and gas wells at the site and within the region, it is possible that oil and gas exploration and production could occur in the future.

g. Relevant Policies. The Antioch General Plan contains policies that pertain to the management of hazards related to geology, soils and seismicity. The following policies are relevant to the project:

- ☐ The City should prohibit development in those geologically hazardous areas which, by their very nature, would cause extensive loss of life, injuries, property damage and endanger the utility distribution.

- ☐ The City should strive to eliminate code violations, through rehabilitation or demolition, in existing structures, within the community which do not meet the Uniform Building Code requirements for seismic zones and which can be accomplished with only minimum economic disruption.

- ☐ The City should protect natural areas by limiting development in those areas, which due to adverse geological conditions and/or possible extensive surface drainage problems, will be hazardous to the overall community and to those who will inhabit the area.

- ☐ The City shall require the developer to provide pertinent information on geological and seismic characteristics relative to the area in which development is attempted. If the area appears to have some questionable aspects with regard to geological and seismic hazards, this information shall be forwarded to the prospective buyer by the developer.

- ☐ Although the nature of the geological formations and the history of earth shaking intensities appears to preclude any massive seismic hazard to low density residential development, adequate codes and controls with special safety provisions shall regulate the construction of structures which are designed to house the sick and elderly or buildings used for large public assemblies including, but not limited to schools, theaters, hospitals and auditoriums.

- ☐ Adequate measures should be developed to safeguard the public from seismic hazards associated with high voltage lines, caustic and toxic gas and fuel and inflammable storage facilities.

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33 Wills, Chris, Geologist, California Division of Mines and Geology, personal communication with Kevin O'Dea, Baseline, 6 January 1995.

III.E.2 Impacts

a. Significance Criteria. The project would have a significant impact if it were to: result in the exposure of people or structures to major geologic hazards, result in unstable earth conditions, result in a change in topography, or increase erosion or siltation. Significant geologic hazards would include geologic and/or seismic conditions that could not be mitigated by implementation of standard engineering design or construction practices, non-compliance with Federal and State safety laws and regulations, and/or local grading/excavation regulations.

b. Effects Found to be Potentially Significant. Potential impacts of the project include unstable slopes, erosion, fill settlement, expansive soils and seismic hazards.

(1) **[Impact E-1]** ***Soils on hillslopes could be subject to slope failure and erosion.***

Grading and construction activities would cause disruption and displacement of soils. Unstable slopes have been identified on the southern hill and northeastern side of the central hill. Small soil slips were identified on slopes that had been overly steepened along road cuts and stream banks. Roadway and building construction in the vicinity of unstable slopes may activate, or reactive landslides. North-northeastward facing slopes are naturally more susceptible to slope failure due to the north-northeastward inclination of subsurface sediments. Disturbed soils could be subject to erosion, potentially resulting in increased sediment loads in runoff from the site. Eroded soil may enter surface water systems, potentially affecting water quality and reducing storm water capacity.

If grading and excavation results in disturbance of five or more acres of total land area, a General Construction Activity Storm Water Permit shall be required from the State Water Resources Control Board. Erosion-related impacts and discussed further in Section III.F, *Hydrology*, below.

(2) **[Impact E-2]** ***Structures within the project site could sustain damage from differential settlement due to weak or expansive soils.***

Soils underlying the project site have low strength and moderate to high shrink/swell potential. Structural damage, warping, and cracking of roads and sidewalks, and rupture of utility lines may occur if the potential for ground settlement and expansive soils were not considered during design and construction of improvements.

(3) **[Impact E-3]** ***Strong ground shaking during an earthquake could cause structural damage, slope failure and may result injuries to the public.***

Expected earthquakes on the Coast Range-Sierran Block Boundary zone could cause violent to very violent seismic shaking at the project site (MMI XI). Seismic shaking of this intensity could initiate slope failure, liquefaction of sediments, settlement and could result in damage to structures and injuries to people present at the site. Damage to roads, railroads and utilities could limit communication and transportation.

(4) **[Impact E-4]** ***Urban development on the east side of the project site may expose people and property to public safety risks from natural gas extraction activities.***

There is one operating natural gas production well located near the Southern Pacific Railroad tracks on the northeast portion of the project site. Western Continental Operating Company intends to continue operating this well, and plans to construct an additional gas well within the next one to two years. Urban

development in the area may result in public safety risks unless extraction activities are subject to adequate safety controls.

Unstable slopes, weak and expansive soils, along with the potential for ground shaking and liquefaction during earthquakes, would represent significant adverse impacts. Exposure of people and property to public safety risk from continued natural gas extraction may occur.

III.E.3 Mitigation Measures

Impact E1 Soils on hillslopes could be subject to slope failure and erosion.

Mitigation Measure E1 Appropriate structure and road design would reduce hazards associated with unstable hillslopes and erosion.

A grading plan shall be prepared by the site developer for final design review of the project. Pursuant to Uniform Building Code requirements, the grading plan shall be prepared by a licensed civil engineer and include soils engineering and engineering geology reports. The grading plan shall accurately show all cut and fill areas and provide calculated earthwork volumes. The grading plan shall also address erosion control and describe drainage facilities. The soil engineering and engineering geology reports required for the grading plan shall specifically address the slope stability of any proposed cut slopes and potentially unstable areas, including north-northeastern slopes, and their suitability for any proposed building, roadway, or other infrastructure development. Their recommendations shall be included in the grading and building plans prepared for the project. All grading activities shall be routinely inspected by the project geotechnical engineer in order to ensure that recommendations are incorporated during field activities.

The following measures should be considered in development of the recommendations for the grading plan:

- ☐ During or following completion of construction activities, exposed soils shall be stabilized by mechanical methods or landscaped with drought-tolerant plantings to control erosion. Erosion control should be implemented in conformance with guidelines in the Association of Bay Area Governments (ABAG) *Manual of Standards for Erosion and Sediment Control Measures*.
- ☐ Construction of structures for human occupancy and infrastructure elements shall be setback from the crest of slopes that are higher than ten feet and steeper than 25 percent (4H:1V).
- ☐ Subsurface drains shall be placed beneath all fills and designed to discharge to the storm drainage system.
- ☐ The differential thickness of fills placed beneath structures and infrastructure elements shall be minimized to control differential settlement of the fills.
- ☐ Surface water drainage shall be controlled to prevent discharge of water onto or into fills placed at the project site.

- ☐ Prior to placement of thick structural fills, all surficial soils and weathered bedrock shall be excavated to minimize the potential for down-slope creep.

- ☐ Design of fills shall address the potential for fills or portions of fills to eventually become saturated.

- ☐ All surface drainage facilities shall be inspected and maintained on an routine basis by a designated public agency or a homeowners' association to prevent erosion problems.

Impact E2 Structures could sustain damage from differential settlement due to weak or expansive soils.

Mitigation Measure E2 Site and building design shall take account of weak and/or expansive soils.

The soils engineering and engineering geology reports shall identify areas where weak and expansive soil would likely affect proposed development and provide design specifications for minimizing the potential for damage due to weak and expansive soils. The following measures shall be considered for building designs:

- ☐ Building foundations and improvements founded on expansive soils shall consist of drilled pier and grade beams, deepened footings (to address expansive soil), or post-tensioned slabs. Alternatively, expansive soils shall be removed and replaced with compacted non-expansive soil prior to foundation construction, or other appropriate stabilization techniques implemented acceptable to the City of Antioch.

- ☐ Subgrade soils for pavements shall consist of moisture-conditioned, lime-treated, or non-expansive soil.

- ☐ Surface and subsurface water shall be directed away from foundation elements to minimize variations in soil moisture.

Impact E-3 Strong ground shaking during an earthquake could cause structural damage and slope failure, and could result in injuries to the public.

Mitigation Measure E3a Site planning and building design shall incorporate provisions to reduce risk to life and property from seismic activity.

Mitigation Measure E3b All buildings, underground utilities, and other improvements shall be designed and constructed in accordance with seismic design criteria presented in the Uniform Building Code.

Hazards can be reduced by engineered structural components that minimize damage from ground shaking and firmly anchoring non-structural objects that may become hazards due to ground shaking. The engineering geology report shall include structural design criteria that would minimize impacts to the project associated with strong ground shaking during an earthquake. The report shall identify any liquefaction hazards that may exist. The engineering geology report shall provide design criteria for structures in areas that may undergo liquefaction during an earthquake. Alternatively, building shall not be permitted in areas subject to liquefaction.

Impact E4 Urban development on the east side of the planning area could expose future population to safety risks in connection with natural gas extraction activities.

Mitigation Measure E4 Implement actions to protect the public from risks associated with natural gas extraction activities, for the duration of those activities.

Actions shall include:

(1) No new extraction permits shall be issued, consistent with policies in the Antioch General Plan.

(2) Current owners of mineral rights leases shall be contacted by the California Division of Oil, Gas, and Geothermal Resources and the City of Antioch Department of Community Development to assess future plans pertaining to natural gas exploration and production at the project site. The City of Antioch shall establish access routes for exploration and production equipment.

(3) Setback distances from existing and proposed production wells shall be established for urban development in the vicinity of natural gas operations, in accordance with safety criteria established by the California Division of Oil, Gas, and Geothermal Resources. Protective barriers may be required where appropriate

(4) If necessary, proposed development plans shall designate an area for preservation as a future site for consolidation of gas wells and gas production.

The mitigation measures described above would reduce the identified impacts to less than significant levels.

III.F FLOODING AND DRAINAGE[34]

III.F.1 Setting

a. Introduction. This section summarizes existing hydrological conditions within the study area and evaluates existing and potential flooding and drainage impacts. As with most of the topical analyses in Chapter III, it builds on environmental research and analysis presented in the *Infrastructure Plan EIR* (see p. 120).

b. Climate. The climate of the Antioch area is characterized as Mediterranean, with cool wet winters and warm dry summers. The mean annual rainfall in the vicinity of the project area, the majority of which falls between October and April, is approximately 15 inches.[35] Analysis of long-term precipitation records indicates that wetter and drier cycles lasting several years are common in the region. Severe, damaging rainstorms occur at a frequency of about once every three years.[36]

c. Drainage and Flooding. The approximately 785 acre study area is located in a largely undeveloped and/or agricultural region south of Antioch and includes hilly uplands in the west and relatively flat lowlands in the east and south. Ground surface elevations range from a low of approximately 75 feet above mean sea level (AMSL) along East Antioch Creek, to approximately 249 feet AMSL in the upland area in the central portion of the study area. Surface water drainage patterns are complex in the hilly upland areas (Figure 24).

East Antioch Creek (a constructed channel built by the Contra Costa County Flood Control District in 1988) is the primary drainage feature of the study area (Figure 25); other established channels (e.g., creeks or streams) were not observed. Drainage occurs as overland flow until it reaches East Antioch Creek or the Lindsey Basin. Based on review of hydrology maps, most of the site drains into East Antioch Creek (Drainage Area 56).[37] The southeast corner of the site drains to the east into an existing unimproved drainage system (Drainage Area 30C). The Creek currently has the capacity to convey runoff from a ten-year storm. The Lindsey Basin is being enlarged in the summer of 1995 to contain 25-year flood flows. The Basin was designed to temporarily contain runoff to reduce peak storm flows downstream. Controlled outflows from Lindsey Basin are routed through a pipeline which begins at the northwestern end of the basin and runs northwestward approximately 4,000 feet and discharges into an open channel near the intersection of the Southern Pacific Railroad and Highway 4. Water flowing in this creek evaporates, infiltrates into the subsurface, or eventually discharges into the San Joaquin River.

It is expected that with future development, including construction of the SR 4 Bypass, Los Vaqueros pipeline and construction of residences, the Creek and Basin will be expanded to accommodate runoff from the 100-year event. Improvements to the Creek and Basin are likely to occur in phases over the next few years.[38] Completion of improvements to the drainage system to manage 100-year flows would not be expected until the SR 4 Bypass and Los Vaqueros pipeline projects are implemented. The enlargement of Lindsey Basin capacity to contain the 25-year flood flows will be completed in 1995. The schedule for improvements to the channel has not been finalized.

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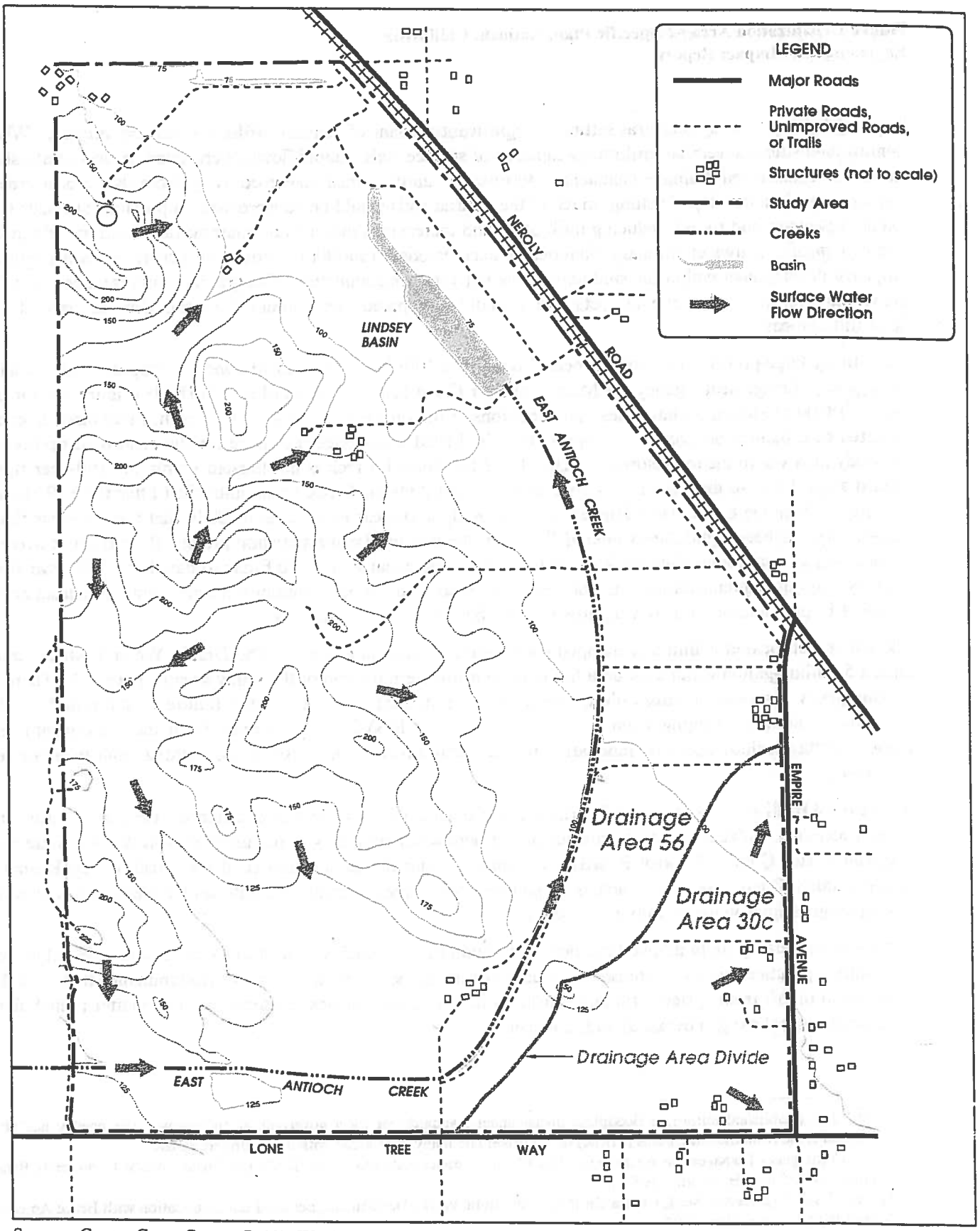
34 Background information, analysis of impacts, recommendation of mitigation measures and draft graphics for the *Flooding and Drainage* section have been prepared by Baseline Environmental Consulting.

35 Rantz, S.E., *Mean Annual Precipitation and Precipitation Depth-Duration-Frequency Data for the San Francisco Bay Region, California*, U.S. Geological Survey, Open File Report 3019-12, October 1971; U.S. Department of Agriculture, Soil Survey of Contra Costa County 1977; Contra Costa County Flood Control District, *Draft Subsequent Environmental Impact Report, Marsh Creek Watershed Regional Drainage Facility, Sand Creek Improvements*, January, 1992.

36 Brown, William M. III, *Historical Setting of the Storm: Perspectives on Population, Development and Damaging Rainstorms in the San Francisco Bay Region*, in Landslides, Floods and Marine Effects of the Storm of January 3-5, 1982, in the San Francisco Bay Region, California, Stephen D. Ellen and Gerald F. Wieczorek, Eds., U.S. Geological Survey Professional Paper 1434, 1988.

37 Contra Costa County Department of Public Works, Drainage Area 56 and 30C, Hydrology Maps, 1980 and 1979, respectively.

38 Detjens, Paul, Engineering Staff, Contra Costa County Public Works Department, personal communication with Bruce Amen of BASELINE, 14 November, 1994 and with Kevin O'Dea of BASELINE, 2 August, 1995.



Source: Contra Costa County Public Works Department, Drainage Areas 56 and 30c Hydrology Maps, 1980, 1979

Figure 24

Drainage

0 500 1000 2000

In an undeveloped or agricultural setting, a significant amount of rainfall infiltrates into the ground. When rainfall intensities exceed the infiltration capacity of surface soils, runoff flows overground toward established natural or constructed drainage channels. Stormwater runoff is then conveyed away from the area in creeks and streams. In a developed setting, much of the natural soils would be covered with impervious surfaces (i.e. roads, driveways and roofs), reducing infiltration and increasing amounts and altering flow patterns of runoff. The design of stormwater drainage facilities to accommodate runoff that would be generated as a result of proposed development within the study area have not yet been completed. The grading and drainage plans for individual projects within the projects site would be prepared and submitted to the City as part of the permitting process.

A relatively large portion of the site is located within the 100-year flood hazard zone as mapped by the Federal Emergency Management Agency (FEMA)[39] on their Flood Insurance Rate Map[40] (FIRM) (Figure 26) for the area. FIRMs are based on land uses and conditions at the time of the study. As a result, these maps become outdated as urbanization occurs. It appears that the FIRM is no longer accurate for the southwest portion of the study area where the reconstructed channel of East Antioch Creek is not located within the 100-year flood hazard zone, because the existing configuration of East Antioch Creek was established after the FIRM was prepared. Since the Creek was designed to convey only a 10-year event, it is unlikely that the 100-year flood hazard zone has been significantly altered.[41] Under the Interim Basin Expansion project, the basin is currently being enlarged to accommodate the 25-year flow. Ultimate expansion of the Basin to handle the 100-year flow is proposed, but implementation has not been scheduled, and would probably not occur until construction of the SR 4 Bypass and/or the Los Vaqueros Pipeline begins in five to ten years.

The site is not located within any mapped dam failure inundation areas.[42] The Diablo Water District maintains a 5 million-gallon water tank on a hill in the northwestern portion of the study area (Figure 26). There is no emergency response or tank failure inundation area defined for catastrophic failure of the tank.[43] The elevation of the site (ranging from 75 to 249 feet above NGVD) and distance from the Sacramento-San Joaquin Delta preclude potential inundation by coastal hazards, such as tsunamis, extreme high tides, or sea level rise.

d. Water Quality. The quality of surface and groundwater at the site is affected by land uses within the entire watershed. Water quality in surface and groundwater bodies is regulated primarily by the State and Regional Water Quality Control Boards. The site is under the jurisdiction of the Central Valley Regional Water Quality Control Board, which is responsible for implementation of State and Federal water quality protection guidelines in the vicinity of the site.

Surface water quality, both as overland flow and within East Antioch Creek, may be adversely affected by the agricultural practices which dominate land uses within the study area. Typical contaminants that may be entrained in runoff from agricultural lands includes herbicides, pesticides, bacteria, organic matter (which may increase biological oxygen demand) and sediment.

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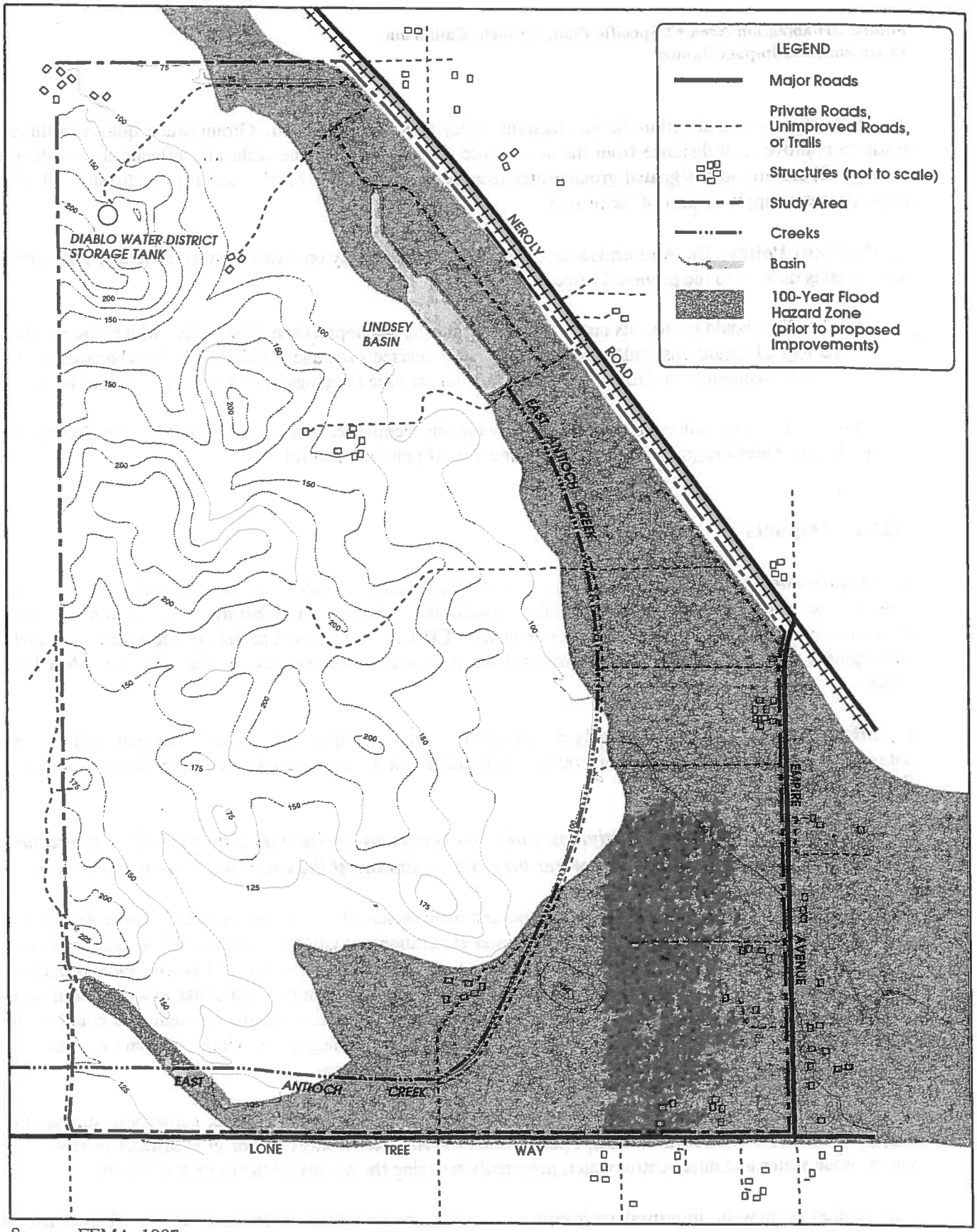
39 FEMA has established minimum floodplain management standards for local governments to follow. The agency has also developed flood insurance rate maps (FIRM) for all urban and many rural areas within the United States.

40 Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM), Contra Costa County, Community Panel Number 060025 0335B, 16 July, 1987.

41 Detjens, Paul, Engineering Staff, Contra Costa County Public Works Department, personal communication with Bruce Amen of BASELINE, 14 November, 1994.

42 Association of Bay Area Governments (ABAG), Map of *Dam Failure Inundation Areas, San Francisco Bay Region*, March 1980.

43 Bowers, Danny, Superintendent of Operations, Diablo Water District, personal communication with Bruce Amen of BASELINE Environmental Consulting, 15 November, 1994.



Source: FEMA, 1987

Figure 25

100-Year Flood Hazard Zone

0 500 1000 2000

Antioch Future Urbanization Area #2 EIR

The study area is located within the San Joaquin Valley Groundwater Basin. Groundwater quality in this area tends to improve with distance from the delta, since those areas near the delta are influenced by salt water mixing. There are no designated groundwater recharge areas in FUA #2.[44] Local groundwater will not be used for water supply as part of the project.

e. Relevant Policy. The Antioch General Plan contains one policy on water resources, quality and drainage that pertains directly to the proposed project.

- The City should protect its natural areas by limiting development in those areas, which due to adverse geological conditions and/or possible extensive surface drainage problems, will be hazardous to the overall community and to those who will inhabit the area (Geology and Hydrology, Policy No. 4).

In addition, the City shall continue to comply with the requirements of participation in the Contra Costa County Clean Water Program for non-point source runoff pollution control.

III.F.2 Impacts

a. Significance Criteria. Substantial flooding, degradation of water quality, contamination of a public water supply, substantial interference with groundwater recharge, and altering the direction or flow of groundwater are considered significant effects under CEQA. The proposed project would result in intensified development of a rural environment. Areas of the proposed project site are within 100-year flood hazard zones.

b. Effects Found to be Potentially Significant. Potential impacts of the proposed plan include degradation of the quality of nearby water bodies and flooding due to increased impervious surfaces and existing flood hazards.

(1) **[Impact F1]** ***Construction activities and post-construction site uses could result in degradation of water quality in nearby surface water bodies by reducing the quality of storm water runoff.***

Construction and grading would require temporary disturbance of surface soils and removal of vegetative cover. During the construction period, grading and excavation activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. Soil stockpiles and excavated areas would be exposed to runoff and, if not managed properly, the runoff could cause erosion and increased sedimentation in water courses at or away from the project area. The accumulation of sediment could result in blockage of flows, potentially resulting in increased localized ponding or flooding. Sediment-laden runoff entering creeks and rivers would reduce water quality in these drainages.

The potential for chemical releases exists at most construction sites. Once released, substances such as fuels, oils, paints and solvents could be transported to nearby surface waterways and/or groundwater in storm water runoff, wash water and dust control water, potentially reducing the quality of the receiving waters.

Construction of new or improved roadways and parking areas would result in increased vehicle use and potential discharge of associated pollutants. Leaks of fuel or lubricants, tire wear and fallout from exhaust

44 Jensen, Art, Director, Contra Costa Water District, personal communication with Bruce Amen of BASELINE, 12 May, 1994.

contribute petroleum hydrocarbons, heavy metals and sediment to the pollutant load in runoff being transported to receiving waters. Landscaping maintenance may involve the use of fertilizers, herbicides and pesticides; residues of these substances could be incorporated into the runoff from the site.

(2) **[Impact F2]** ***Portions of the planning area are located in the 100-year flood hazard zone and could be subject to damage during flooding.***

The eastern and southern portion of the proposed project site are located within the 100-year flood zone. In addition, the northeastern portion of the site includes the Lindsey Basin, a stormwater detention basin operated by the Contra Costa County Flood Control District. Under current conditions, the channel of East Antioch Creek at the project site has the capacity to contain a 10-year event; Lindsey Basin is currently being enlarged to contain the 25-year flood flows. During a 100-year flooding event, the capacities of the Creek and the Basin will be exceeded and flooding of areas proposed for residential and commercial development will occur. Damage to structures and other improvements would be expected if these areas are not protected from flooding. If improvements to the drainage system are completed prior to implementation of the FUA #2 project that would provide 100-year flood protection, further mitigation of flood hazards would not be necessary.

(3) **[Impact F3]** ***Development of the planning area would result in the construction of impervious surfaces, causing an increase in the volume and velocity of storm water runoff and potentially increasing flooding hazards.***

The project site is currently supporting agricultural and open space uses. Under these conditions, the potential for infiltration of surface water runoff is near the maximum level allowed by the natural soil conditions. Construction of buildings and pavements, which are impervious surfaces, will reduce the potential for infiltration and increase the amount of storm water runoff generated at the project site. The volume and velocity of runoff generated at particular locations at the project site cannot be accurately determined until specific development plans are submitted for review. However, significant increases in runoff would be expected. The increased runoff would, if not controlled, result in increased flood flows and, potentially, increase flooding hazards at the project site.

Water quality degradation and potential localized flooding would constitute significant adverse impacts unless adequately mitigated.

III.F.3 Mitigation Measures

Impact F1 Potential degradation of water quality during construction.

Mitigation Measure F1 Prepare and comply with Storm Water Pollution Prevention Plan.

Water quality of runoff is regulated by the Federal National Pollution Discharge Elimination System (NPDES) Program (established by the Clean Water Act); the program objective is to control and reduce pollutants to water bodies from nonpoint discharges. The program is administered by the California Regional Water Quality Control Boards. The Central Valley Regional Water Quality Control Board (RWQCB) issues

NPDES nonpoint source permits for discharges to water bodies in the North Coast region for municipalities and major industries.

Projects disturbing more than five acres of land during construction are required to file a Notice of Intent (NOI) to be covered under the State NPDES General Construction Permit for discharges of storm water associated with construction activity.[45] A project sponsor must propose control measures that are consistent with the State General Permit. A Storm Water Pollution Prevention Plan (SWPPP) shall be developed and implemented for each site covered by the general permit. A SWPPP should include Best Management Practices (BMPs) designed to reduce potential impacts to surface water quality through the construction and life of the project.

A SWPPP should be prepared that, when properly implemented, would reduce or eliminate impacts to surface water quality from all phases of the project. Required elements of the SWPPP include:

- **Construction Storm Water Management Controls.** These would include practices to minimize the contact of construction materials and equipment with storm water. The SWPPP should include specific requirements that earthmoving equipment not be operated within an active creek channel. Operation of equipment near creeks should be strictly limited.

- **Erosion and Sediment Control.** BMPs designed to reduce erosion of exposed soil may include, but are not limited to: soil stabilization controls, watering for dust control, perimeter silt fences, placement of hay bales and sediment basins.

- **Post-Construction Stormwater Management.** This refers to measures taken to prevent storm water pollution associated with post-construction activities at the developed site. Controls may include pervious concrete surfaces, painted drain inlets ("Dump no Waste-Drains to Bay") and stream protection buffers. The agency or group responsible for long-term maintenance of post-construction storm water controls will be determined jointly by the City of Antioch and the Contra Costa County Flood Control District. These agencies may require the formation of homeowners associations or light and landscape districts to sponsor or conduct the required maintenance.

The specific BMPs that would be required of a project can be found in *SF Bay Regional Water Quality Control Board Staff Recommendations for New and Redevelopment Controls for Storm Water Programs* (1994). Additional sources of information regarding BMPs are the California Storm Water Municipal and Construction Activity BMP Handbooks (Storm Water Quality Task Force, 1993). The selection of BMPs required for a specific project is based on the size of the development and the sensitivity of the area. A model SWPPP for a new subdivision is available for review from the Contra Costa County Stormwater Pollution Control Program.

Impact F2 Portions of the planning area are located in the 100-year flood hazard zone and could be subject to damage during flooding.

45 California State Water Resources Control Board, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity, Order No. 92-08-DWQ, adopted 20 August, 1992.

Mitigation Measure F2 Defer development in the 100-year flood zone until capacity improvements have been provided for.

Prior to development of the areas designated as within the 100-year flood zone, improvements to the East Antioch Creek channel and Lindsey Basin shall be made that would increase the capacities of these drainage system components to allow conveyance and/or storage of the 100-year flows. The design and construction of the improvements shall be the responsibility of the Contra Costa County Flood Control District (CCCFCD) in tandem with the developer(s) of projects within these areas. The design shall consider total buildout of the planning area and all cumulative projects which drain to East Antioch Creek and potential downstream flooding effects. When CCCFCD has accepted a design for improvements, the District shall request a Conditional Letter of Map Revision from FEMA. Upon approval by FEMA, the developer will work with CCCFCD to obtain necessary authorizations, permits and financing to implement the flood protection improvements.

Impact F3 Impervious surfaces constructed as part of future development may cause increases in the volume and velocity of storm water runoff and potentially increase flood hazards.

Mitigation Measure F3 Construct needed facilities to detain runoff onsite to avoid increased downstream flooding.

The *Infrastructure Plan EIR* includes an extensive summary and assessment of preliminary engineering work[46] for storm water facilities for each of the FUA #2 development scenarios covered in that EIR (see pp. 120-128). Preliminary size and cost estimates are presently being updated for the proposed Specific Plan. It is expected that any revisions to these facilities that are necessitated by the development allowed under the proposed plan would be feasible.

A tentative map for each phase of development of the project would be submitted to the City of Antioch Department of Community Development (ADCD), Building Division for review. Grading and drainage plans would be reviewed for compliance with City requirements by the ADCD, Engineering Division. Any undersized components in the downstream storm drain system would be identified at that time and new design required prior to plan approval. Compliance with the existing review process is an adequate mitigation measure to reduce this potential impact to a level of insignificance.

Compliance with existing laws, regulations, City policies, programs and easement restrictions, in addition to implementation of the above recommended mitigation measures would reduce the identified flooding and drainage impacts to less-than-significant levels.

46 *Preliminary Utility Sizing and Budget Cost Alternatives for the Study Area,* McGill·Martin·Self, 1991.

III.G PUBLIC HEALTH AND SAFETY[47]

III.G.1 Setting

a. Introduction. This section identifies current and previous land uses at the site associated with public health and safety impacts and includes a discussion of the management and regulatory framework for hazardous materials[48] use at the project site. Figure 16 identifies potential site hazards.

b. Current and Previous Land Uses. Information about current and previous land uses was obtained by reviewing historical maps and photographs of the area, and interviewing residents and individuals familiar with the area. Land uses that may result in public health and safety impacts include agricultural uses, water treatment and storage facilities and gas production. Public health and safety impacts may also be associated with fuel pipelines not associated with the gas production at the site, railroad operations and overhead electrical transmission lines.

(1) Agricultural Land Uses. The current and past land uses at the project site have primarily included farms and ranches, with most of the land used for hay or grain crops, orchards, cattle grazing or open space.

(a) Agricultural Chemical Use. The storage, use and disposal of agricultural chemicals at the farms and ranches may have exposed the environment to agricultural chemical residues. Prior to the 1950s, the primary crops grown at the project were apricots, grapes, walnuts, almonds, alfalfa, barley and wheat. More recent crops include apples, peaches, pears, apricots, walnuts and alfalfa. Agricultural chemicals potentially used on these crops are listed in Table 23. Application rates vary for each crop and due to seasonal conditions. Agricultural chemicals may be applied infrequently, less than once a year or may be applied as much as four times a year.[49] Agricultural chemicals are used more frequently for orchard crops and less frequently for field crops.

(b) Fuel Usage. Fuels and oils used at the farms and ranches are stored in small volumes in aboveground tanks, cans, or drums. Spills and leaks from former and existing fuel and oil use and storage could result in impacts to the subsurface soil and groundwater quality. Small agricultural fuel tanks are exempt from tank permitting requirements. Thus, no records pertaining to tank storage at the site were available.[50] [51] No releases of fuels from agricultural tanks have been reported at the site.

(c) Contaminant Migration. Some of the drinking water wells onsite have been in place for decades. Some of these old wells have deteriorated and collapsed. Wells that were not properly abandoned may act as conduits for contaminants from livestock wastes, surface spills, or vandalism, to migrate to and impact groundwater quality.

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47 Background information, analysis of impacts, recommendation of mitigation measures and draft graphics for the *Public Health and Safety* section have been prepared by Baseline Environmental Consulting.

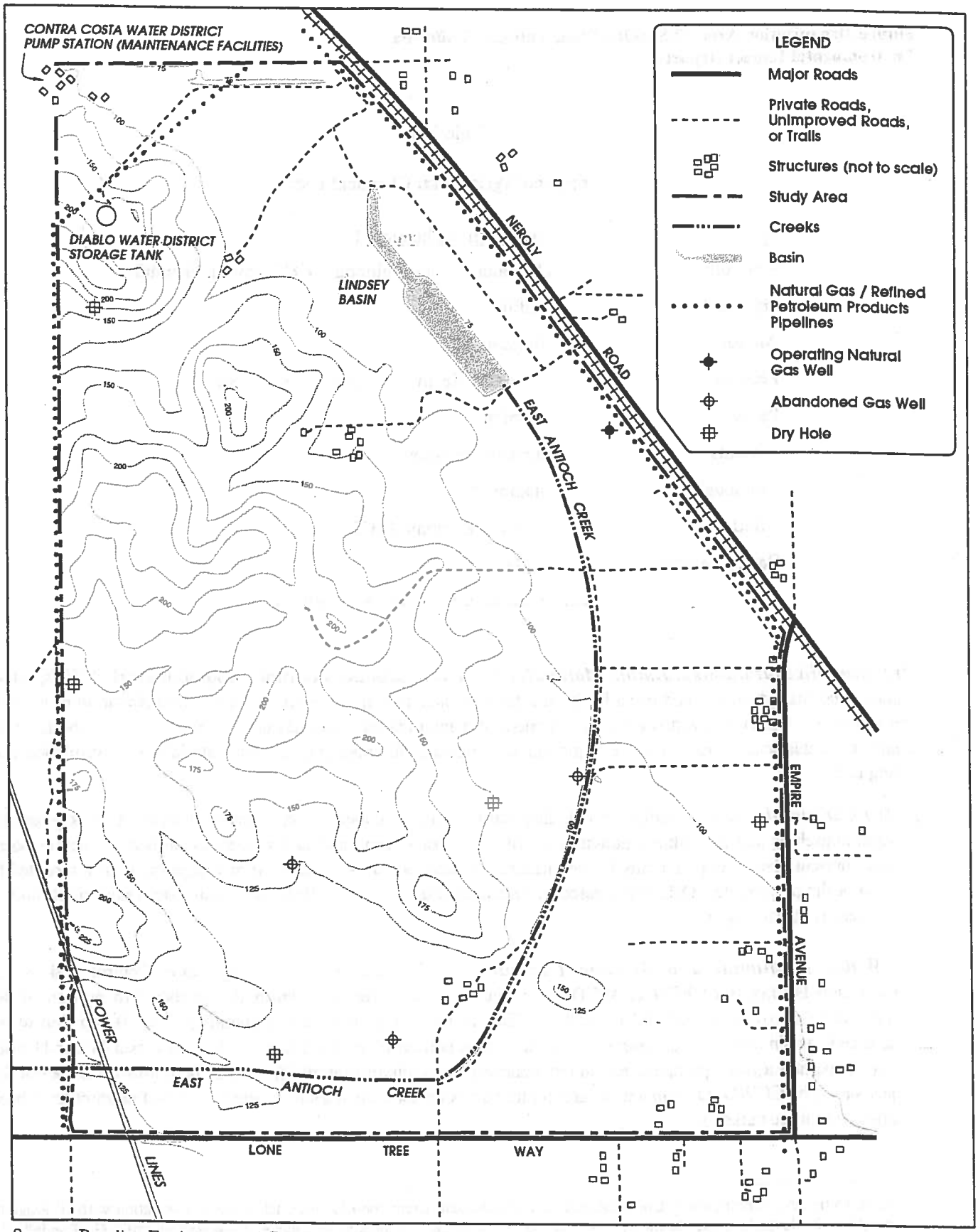
48 For the purposes of developing hazardous materials business plans, California's laws define a hazardous material as:

> . . . any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety, or to the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, radioactive materials and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment (California Health and Safety Code, §25501).

49 Alari, Patti, 1993, Contra Costa County Agriculture Department, Brentwood District, telephone conversation with G. Randall, BASELINE, 2 November.

50 Thude, Larry, 1993, Fire Inspector, Riverview Fire District, telephone conversation with G. Randall, BASELINE, 2 November.

51 Clary, John, 1993, Operations Chief, East Diablo Fire Prevention, telephone conversation with G. Randall, BASELINE, 2 November.



Source: Baseline Environmental Consulting

Figure 26

Potential Site Hazards

0 500 1000 2000

Antioch Future Urbanization Area #2 EIR

Table 23a

Crops and Agricultural Chemical Use

Crop	Agricultural Chemical Use[52]
Apricots	Diazonon, Sevin, Thidnon, DDT, Rovral, Benimil
Grapes[53]	Sulfur
Apples	Jugthion
Peaches	Diazonon, Sevin, Thidnon, Rovral, Benimil
Pears	Jugthion
Walnuts	Lursban, Jugthion
Almonds	Unknown
Alfalfa	Furadan, Lorsban, MCPA
Barley, Wheat	2,4-D

Source: Baseline Environmental Consulting

(d) Potentially Hazardous Building Materials. Existing structures, constructed prior to the early 1970's, might contain asbestos, which could cause a health risk to workers and/or the general public during demolition or renovation activities. Asbestos was a common component of many building materials prior to the 1970's. Asbestos-containing materials may include drywall, taping/joint compound, flooring and roofing materials, pipe insulation and ceiling tiles.

(e) Land Disposal Areas. Small household disposal sites are commonly observed in rural areas. Debris generated by rural household and agricultural activities are often disposed of on land and sometimes burned. If any disposal sites are present, they may potentially contain hazardous materials. It is unknown if any disposal sites are located in the area of the project site. Debris generated by recreational users of the hills in the northwestern portion of the site was observed littering the area.

(2) Water Treatment and Storage Facilities. The Contra Costa County Flood Control and Water Conservation District (CCCFCD & WCD) maintains a water detention basin in the northeastern portion of the project site connected to East Antioch Creek. Diablo Water District (Oakley) maintains a 5,000,000-gallon water storage tank within a fenced compound on the northwest portion of the project site. Contra Costa Water District (CCWD) operates a water pump station and maintenance facility immediately adjacent to the northwest corner of the project site. The CCWD maintains underground fuel tanks for their vehicles. No releases of fuel product have been reported from these tanks.[54]

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52 Alari, Patti, 1993, Contra Costa County Agriculture Department, Brentwood District, telephone conversation with G. Randall, Baseline, 2 November; DeMartini, Duey, Diablo Agricultural Chemicals, telephone conversation with G. Randall, 17 November.

53 Not currently grown.

54 Contra Costa County Health Service Department, 1994, *Contra Costa Water District/Antioch Operations 3965 Neroly Road*, Underground Storage Tank file review, 14 November.

(3) Oil and Gas Production. Oil and gas exploration and production in association with the Brentwood oil field has been active at and in the vicinity of the project site since the early 1960's. Nine exploration wells were drilled at the project. Five of these were dry holes. The remainder were developed into gas production wells. During the 1960s through 1980s, three of these operating wells were abandoned in accordance with requirements of the California Division of Oil and Gas. The one operating gas well in the area, operated by Western Continental Operating Company, is located adjacent to the Southern Pacific Railroad tracks located on the northeast portion of the site. The well is currently producing approximately 100,000 cubic feet per day, which is generally a low volume for production wells. Western Continental is planning to construct an additional gas well within 50 feet of the existing well within the next one to two years. Western Continental maintains four-inch lateral pipelines from their wells and a six-inch main pipeline located adjacent to the railroad tracks and Empire Avenue. Pipelines that are currently inactive have been cleaned and plugged, but left in place in anticipation of future use.[55]

City policy regarding natural gas exploration and extraction is discussed in Part E of this chapter under Impact/Mitigation Measure E4.

(4) Fuel Pipelines. Chevron Pipeline Company operates an eight-inch diameter refined petroleum products pipeline and PG&E operates a natural gas pipeline within easements along the west side of the railroad. No known releases of fuels has been reported to have occurred from these pipelines.

(5) Railroad Operations. The Southern Pacific Railroad parallels the northeastern project site boundary. Hazardous materials are commonly transported by rail within Contra Costa County. Increased development adjacent to the railroad tracks may result in increased potential risk to public health and safety in the event of a hazardous materials release due to a train accident.

(6) Electrical Overhead Transmission Lines. One 230 kilovolt (kV) electrical overhead transmission line traverses the eastern portion of the project site along a 175 to 200 feet wide easement. Buildings in the area are served by 21 kV and 4 kV pole lines.[56] Hazards associated with electrical transmission lines may include the potential presence of old transformers containing polychlorinated biphenyls (PCBs), health effects from exposure to electromagnetic fields (EMF) and nuisance hazards due to induction.

c. Regulatory Framework. The management, control and transportation of hazardous materials are primarily regulated by the U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), California Environmental Protection Agency Department of Toxic Substances Control (DTSC), State Fire Marshal, California State Water Resources Control Board (SWRCB) and Central Valley Regional Water Quality Control Board (RWQCB).

In addition to these Federal and State agencies, local agencies include the Contra Costa County Health Services Department Environmental Health Division (CCCEHD), Contra Costa County Consolidated Fire District, Riverview Fire Protection District, Contra Costa County Agricultural Commissioner's Office and the Bay Area Air Quality Management District. The California Division of Oil, Gas and Geothermal Resources regulates oil and gas well operations. The jurisdictions and responsibilities of these agencies are summarized in Table 24 below.

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55 Laperle, George, 1994, Western Continental Operating Company, President, telephone conversation with G. Randall, BASELINE, 8 September.

56 Burton, Randy, 1993, Pacific Gas and Electric Land Division, telephone conversation with G. Randall, BASELINE, 28 October.

Table 24

Hazardous Materials - Regulatory Framework

Regulatory Agency	Responsibility
FEDERAL AGENCIES	
Dept. of Transportation	Hazardous Materials Transportation Act - CFR 49
Environmental Protection Agency	Federal Water Pollution Control Act Clean Air Act Resource conservation & Recovery Act (RCRA) Comprehensive Environmental Response, Compensation & Liabil Act (CERCLA) Superfund Amendments & Reauthorization Act (SARA) Federal Insecticide, Fungicide & Rodenticide Act
Occupational Safety & Health Admin.	Occupational Safety and Health Act & CFR 29
STATE AGENCIES	
Dept. of Toxic Substances Control	California Code of Regulations (CCR) Titles 26
Dept. of Industrial Relations (CAL-OSHA)	California Occupational Safety & Health Act CCR Title 8
State Water Resources Control Board & Regional Water Quality Control Board	Porter-Cologne Water Quality Control Act Underground Storage Tank Law
Health & Welfare Agency Air Resources Board & Air Pollution Contro District	Safe Drinking Water & Toxic Enforcement Ace Air Resources Act
Office of Emergency Services	Hazardous Materials Release Response Plans/Inventory Law Acutely Hazardous Materials Law
Dept. of Fish & Game	Fish & Game Code
Dept. of Food & Agriculture	Food & Agriculture Code
State Fire Marshal	Uniform Fire Code, CCR Title 19
CONTRA COSTA COUNTY AGENCIES	
Contra Costa County Health Services Dept., Environmental Health Management Divisio	CCR Title 26 Hazardous Waste Control Law Hazardous Waste Release Response Plans/Inventory Law Acutely Hazardous Materials Law Underground Storage Tanks Law Medical Waste Management Act
Contra Costa County Fire Prevention Dist.	Uniform Fire Code, Underground Storage Tank Law

Source: Baseline Environmental Consulting

Available federal, state and local agency lists were reviewed to identify whether hazardous materials were stored or had been released at properties within the specific plan area. No sites were identified within the project area that stored or had experienced a hazardous materials release. Potentially hazardous materials, such as fuels, are stored adjacent to the project at the Contra Costa Water District facility.

d. Relevant Policies. The Hazardous Waste Materials Management Element of the Antioch General Plan also contains policies that pertain to the management of hazardous materials/wastes.[57] The following policies may be relevant to the proposed project:

- New or expanding hazardous material users shall be required to reduce the amount of hazardous waste generated (Source Reduction Policy 1).
- Hazardous material facilities shall be located in areas reserved for compatible uses (Facility Siting Policy 1).
- Pipelines and other channels for hazardous materials shall be carefully reviewed so the potential impacts are lessened (Facility Siting Policy 4).
- Hazardous material facilities shall be located at a sufficient distance from populated areas to reduce health and safety impacts (Health and Safety Policy 1).
- The transport of hazardous materials through the City of Antioch shall be conducted in the safest possible manner (Health and Safety Policy 3).
- Hazardous materials facilities within the City's Planning Area shall be operated in a safe manner (Health and Safety Policy 4).
- Appropriate design features shall be incorporated into each facility's layout to increase its safety and minimize adverse effects on health (Health and Safety Policy 5).

For reference, County policies (Contra Costa County General Plan 1990-2005) pertaining to the management of hazardous materials in unincorporated areas include the following:

- To the greatest possible extent, new fuel pipelines should not be routed through centers of population nor should they cross major disaster evacuation routes (Policy 10-67)
- In order to provide for public safety, urban and suburban development should not take place in areas where they would be subject to safety hazards from oil and gas wells. Development near oil and gas wells should meet recognized safety standards (Policy 10-68)

III.G.2 Impacts

a. Significance Criteria. The use, production, or disposal of materials which pose a hazard to people, animal, or plant populations is considered a significant environmental impact.

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57 City of Antioch *Hazardous Materials Management Element,* City of Antioch General Plan, 1988-2000, Adopted 13 November, 1994.

b. Effects Found to be Potentially Significant. Potential impacts of the proposed plan include exposure to hazardous materials, electromagnetic fields and PCBs, as well as hazards associated with gas exploration and production.

(1)* [Impact G-1] *Construction workers and the public may be exposed to potentially hazardous materials during project development.

Fuel and natural gas pipelines traverse the northeast border of the project site. Leaks or spills of fuels in the vicinity of these lines may be encountered during nearby grading or excavation activities. Movement of heavy equipment over buried pipelines that are not supported for that type of activity may result in damage to pipelines and releases of potential hazardous materials.

Construction workers may bring potentially hazardous materials, such as fuel, solvents, paints, oils onto the project site during development activities. Asbestos-containing materials may be present in existing structures constructed prior to the early 1970s. Demolition or renovation of those structures may release asbestos into the air. The health of workers and the public may be adversely affected through inhalation of airborne asbestos particles.

The historical use of the site indicates that agricultural chemicals have been applied to orchards and field crops grown at the site. There is a potential for chemical residues to remain in soils. Spills may have occurred in areas used for storage and/or mixing of agricultural chemicals, or during cleaning of equipment used during application.

Small aboveground or underground agricultural fuel tanks, exempt from permitting regulations, may have been used in the past and may still be in use. Small volume releases that have occurred over a long period of time from storage tanks or stored equipment may have resulted in impacts to soil or groundwater quality.

Old water wells that are no longer in use at the site could act as conduits for any spilled surface contaminants to migrate to groundwater. If their openings are not sealed securely, open wells are a hazard to small children and animals.

It is unknown if small land disposal sites (often observed in similar rural areas) are located within the planning area. If they exist, there is a potential for hazardous materials to have also been disposed of in addition to household debris.

(2)* [Impact G-2] *Potential health impacts may result from exposure to electromagnetic fields, PCBs and effects associated with overhead electrical lines.

Electromagnetic fields (EMF) are generated by electric voltage (electric fields) and by electric current (magnetic fields). Some studies of EMF such as those generated by transmission lines suggest that EMF may have adverse human health impacts; however there no scientific consensus on the actual health effects of EMF exposure has been reached. The California Department of Education is currently the only responsible state regulatory agency that has adopted setback standards for locating schools near high voltage electrical transmission line easements as a prudent measure to reduce potential exposure of EMFs to school children. The DOE setback standards are as follows:

- 100 feet for 50-133 kV line

- 150 feet for 220-230 kV line
- 350 feet for 500-550 kV line

The proposed school site location (see Figure 3) does not appear to lie within the specified distances of high voltage lines. However, residences may be located near the 230 kV line that traverses the southwest corner of the project site (see Figure 26).

Older electrical transformers may contain residual PCBs which if released, are a potential health and environmental hazard. Releases may occur if transformers containing PCBs are damaged from weather, vandalism, equipment failure, or during maintenance activities. It is not known whether the electrical transformers onsite contain PCBs.

Induction effects are primarily nuisance conditions associated with objects being in close proximity to electrical lines, with the exception of interference with cardiac pacemakers which can be a health hazard.

(3)* [Impact G-3] *Development of the project site would result in an increase in the use, storage and disposal of hazardous materials.

The proposed business park and retail areas would include occupants that use, store and dispose of hazardous materials. The generation of household hazardous wastes would increase as a result of the project.

(4)* [Impact G-4] *Development of the project could result in exposure of people to potential hazards associated with gas exploration and production.

Nine gas exploration wells have been drilled at the project site. All but one of the wells have been abandoned; one well continues to produce gas. Development within the planning area could result in increased risks of injury or property damage related to explosion, fire or toxic gases if structures for human occupancy are constructed close to the wells. Productive and abandoned wells present the potential for release of natural gas into the environment. Natural gas is a flammable and potentially explosive substance that can contain toxic concentrations of harmful gases. Potential accidents during operation or maintenance of producing wells could result in explosion or fire. Although wells must be abandoned in accordance with the State Onshore Well Regulations, gas leaking from sealed wells could occur, potentially accumulating in structures constructed over wells not properly abandoned. State regulations include setback requirements for new wells but do not specifically control development near existing wells.

In the absence of adequate mitigation measures, development allowed under the Specific Plan could result in significant adverse public health and safety impacts to construction workers and to residents/employees.

III.G.3 Mitigation Measures

Impact G1 Construction workers and the public may be exposed to potentially hazardous materials during project development.

Mitigation Measure G1 Implement measures to assure that site development not result in public safety hazards from accidental fuel releases, from release of asbestos in demolition activities, or from exposure to agriculture-related or other chemicals that may have been used or disposed of onsite.

Releases of fuel products from pipelines are the responsibility of the pipeline owner. If releases have occurred, the pipeline owner shall investigate and remediate soil and groundwater according to state and local regulations. The accurate locations of pipelines and easements shall be determined and marked prior to development in areas adjacent to reduce the potential for damage to the pipelines during nearby excavation or grading activities. The developer shall contact the pipeline owners and request procedures or restrictions for moving heavy equipment over pipelines, if such movement is likely to occur over pipelines other than at established crossings. If applicable, these procedures shall be submitted with the development plan.

Contractors for the project shall develop a site safety and hazardous materials management plan. The plan shall identify hazardous materials that would be temporarily stored onsite, storage and containment areas and methods, responsible personnel, and safety and emergency procedures in case of accidental releases or exposures. If development were to occur near areas affected by hazardous materials, the affected areas shall be identified within the plan and safety procedures outlined for work in those areas. Procedures to be undertaken in the event that unknown contamination is discovered shall be documented in the plan. Procedures for moving heavy equipment over or operating near underground pipelines shall be included in the plan if applicable. The plan(s) should be reviewed and approved by the County Fire Prevention District and/or the County Environmental Health Division.

An asbestos survey shall be conducted by a California-registered asbestos consultant at all buildings proposed to be demolished or renovated and constructed prior to the 1970s, or suspected having asbestos-containing materials. If asbestos-containing materials are found to be present, they shall be remediated by a qualified, licensed asbestos abatement contractor in accordance with regulations and notification requirements of the Bay Area Air Quality Management District.

A preliminary site assessment (for hazardous materials) shall be conducted by a California registered environmental assessor on all parcels with former agricultural uses prior to development.

- ☐ The assessment shall identify areas where releases of agricultural chemicals, petroleum products, or other potentially hazardous materials are suspected, such as former oil and gas well locations and where other hazards, such as improperly abandoned water wells, or land disposal sites, are located.
- ☐ Soil samples shall be collected by a qualified environmental consultant from areas where orchards and field crops are currently or were historically grown and from areas where potential releases of hazardous materials were identified by the preliminary site assessment to verify the presence or absence of potentially hazardous materials. Sample analyses shall be selected on the basis of known or suspected chemical use.
- ☐ Inactive water wells shall be properly abandoned by a licensed well driller under permit from CCCEHD.
- ☐ Any materials previously disposed of at land disposal sites shall be removed and recycled or disposed of at an appropriate landfill.

Areas with confirmed releases of potentially hazardous materials shall be investigated/remediated according to requirements of the CCCEHD or other applicable regulatory agency.

Impact G2 Potential health impacts may result from exposure to electromagnetic fields, PCBs and effects associated with overhead electrical lines.

Mitigation Measure G2 Implement accepted practices to alert the public to the risks of exposure to electromagnetic field and to hazardous substances associated with electrical transmission.

Because the potential health effects of EMF exposure have not been confirmed by scientific studies, information on the health issues of EMF exposure and the exposure profiles from overhead transmission lines shall be provided by the developer to individuals who may reside near transmission lines summarizing the results of the most recent studies pertaining to EMF exposure.

Prior to development plan submittal, all existing transformers shall be checked for the presence of PCBs by PG&E. If PCBs are present, PG&E shall remove and replace the equipment with non-PCB containing equipment. If any leaks or spills are discovered during this activity or during a preliminary site assessment, an investigation shall be conducted by a qualified environmental consultant to assess impacts from the release and propose remedial actions. Any remediation of PCBs shall be completed prior to development of the parcel in question.

All metal structures or objects located adjacent to transmission line easements shall be properly grounded to prevent electrical shocks from persons or animals in contact with those objects.

Impact G3 Development of the project site would result in an increase in the use, storage and disposal of hazardous materials.

Mitigation Measure G3 Comply with all policies, laws and regulations regarding use and storage of hazardous materials.

Existing federal, state and local hazardous materials laws and regulations, and household hazardous waste programs would mitigate potential hazards associated with hazardous materials management. Businesses that manage hazardous materials have specific permit, storage and reporting requirements depending on the types of hazardous materials managed.

Reduction of hazardous materials used by small businesses and households can be encouraged through education. To encourage use reduction, the City of Antioch shall provide information regarding waste minimization and alternatives to hazardous materials use to be included with mailers or other notices advertising local household hazardous waste collection programs. The information may include specific examples of product alternatives and sources for more information. Additional sources of information may include the CCCEHD, which maintains information regarding alternatives to household hazardous materials use and appropriate disposal, and the County Agricultural Commissioner's Office which maintains information regarding alternatives to agricultural chemical use for landscaping and household orchards and gardens. Additional information regarding reduction of hazardous materials use is generally available at County libraries.

Impact G4 Development of the project could result in exposure of people to potential hazards associated with gas exploration and production.

Mitigation Measure G4 Conform with public safety standards with respect to location of residential and other development in the vicinity of operating and abandoned gas wells.

Any development in the vicinity of the existing operating gas well shall be designed to conform with setback requirements for a "critical well", as defined in State Onshore Well Regulations[58]. Gas wells are considered "critical" if they are within 300 feet of buildings intended for human occupancy or an airport runway, or within 100 feet of a public street, highway, railway, watercourse, public recreational facility or wildlife preserve.

Construction of structures for human occupancy over abandoned gas wells shall be discouraged. Geotechnical reports prepared for grading plans shall include identification of the location of all abandoned gas wells. If abandoned wells are identified, the method of abandonment shall be described and evaluated for possible hazards. The design of any structure for human occupancy located over an abandoned gas well shall incorporate gas/vapor barrier systems with appropriate provisions for ventilation of accumulating gas.

Compliance with existing laws, regulations, City policies, programs and easement restrictions, in addition to implementation of the above recommended mitigation measures would reduce the identified public health and safety impacts to less-than-significant levels.

58 California Code of Regulations, Title 14, Division 2, Chapter 4.

III.H PUBLIC SERVICES

III.H.1 Setting

CEQA requires that public services be addressed in an EIR if the impacts of a proposed project are such that the change in demand for services would result in an physical change in the environment. This analysis focuses on the particular services that could be affected by the proposed specific plan for FUA #2: police protection, fire protection, parks and recreation, and schools.

a. Police Protection. The Antioch Police Department, staffed by 81 sworn officers and 36 non-sworn personnel, patrols the City of Antioch according to a system of five beats. The response time for the highest priority calls (life threatening situations) averages four minutes from the time the call is received to the time one or more officers arrive on the scene.

One beat (Beat 5) covers the entire southeast portion of the city, including all of FUA #2. Staff indicate that additional personnel are already needed to allow division of Beat 5 into two beats, which would provide better coverage of the southeast area.

The Police Department currently estimates its staffing needs based on population. The Antioch General Plan adopts a staffing standard of 1.2 sworn officers per 1,000 residents; more recently (January 1995), the City Council has adopted a goal of 1.39 sworn officers per 1,000 residents (equal to the countywide average). The current ratio is estimated at 1.13 officers per 1,000 residents. Civilian personnel are employed at a rate of one civilian per four sworn officers.

The Antioch Police Department is housed in a relatively new headquarters that is expected to meet the city's police protection needs for the next 20 to 30 years, including those generated by development in FUA #2. The department has no current or anticipated need to develop substations. Instead, mobile units are assigned to designated areas (beats), where they respond to radio-dispatched requests for service. This method of service provision eliminates the need to respond directly from a station.

b. Fire Protection. The Contra Costa County Consolidated Fire Protection District (CCCCFD) serves the portion of Antioch south of State Route 4 from three stations. Station 88, currently located on Deerfield Drive in southeast Antioch, is the first response station to FUA #2. This station is staffed by one captain, one senior firefighter and one firefighter at all times. It is equipped with a fire engine, a power wagon and breathing support apparatus. The station is in the process of being moved north and slightly east of its present location, to a site on Wildhorse Road near Hillcrest Avenue.

Stations 82 and 83 would also respond to calls within FUA #2. Station 82 is currently located near State Route 4. It is staffed similarly to Station 88 and equipped with a triple combination pumper, one engine and one wagon. Relocation of this station to a site further south, in the vicinity of Lone Tree Way, is anticipated but not yet scheduled. Station 83, located near the intersection of Buchanan and Gentry Town Drive, is staffed like the two other stations and equipped with a ladder truck.

The Fire District's *Fire Station Location Plan* (February 1989) establishes a standard radius of 1½ miles for first-due engine company response in the urban service area. The District expects this standard to give it the ability to respond to calls for service within five minutes. An analysis conducted in 1987 showed that response time to calls 1½ miles away from District stations (not necessarily limited to stations in Antioch) was

approximately five minutes, including both travel time and the elapsed time between when calls were received and engine companies began their travel to the site.

The Fire District also requires fire sprinkler protection of any building or structure that requires fire flow of 2,000 gallons per minute or more.

The Contra Costa County Consolidated Fire District levies a fire protection fee on new development. This fee, which is currently set at $235 per housing unit and $0.15 per square foot of nonresidential development, is designated for construction of new fire stations.

c. Parks and Recreation. The City of Antioch has adopted a standard that requires the provision of five acres of parks per 1,000 residents (*Growth Management Goals and Policies)*. According to the Specific Plan, the city counts only those areas suitable for active parks – that is, flatter land that is appropriate for active use – to meet this standard.

d. Schools. Residential development would be located in the western part of FUA #2, which is served by the Antioch Unified School District (AUSD), the Brentwood Union Elementary School District (BUESD) and the Liberty Union High School District (LUHSD).

(1) Antioch Unified School District (AUSD). The AUSD currently operates 10 elementary schools, 2 middle schools, 1 comprehensive high school, 1 continuation high school, 1 independent studies high school and 1 alternative studies high school. One new middle school and one new high school are scheduled to open in 1996. All schools in the AUSD currently operate on year-round schedules, with multi-track attendance in place in the overcrowded facilities.

As part of its ongoing planning process, AUSD prepared a *Comprehensive Economic Facilities Master Plan* in 1993. That plan forecasts enrollments for the district (by subarea), projects facilities needs, identifies funding sources and considers alternative funding strategies. The *Master Facilities Plan* anticipates a total of 300 new students in grades kindergarten through 12 from FUA #2, with the first new students expected to attend in the 1998-99 school year.

Because AUSD funds the construction of new facilities with Mello-Roos Community Facilities Districts, the district must keep track of facilities capacity by subarea. Southeast Antioch, the area closest to FUA #2, is currently served by Muir and London elementary schools. An additional elementary school, Viera, is moving forward through the planning and funding process, and is expected to open in 1998.

Additional capacity will be required to accommodate the projected growth in the area. The district has reserved sites in southeast Antioch for three additional elementary schools (in addition to the three identified above) and one additional middle school. In addition, the district has recently purchased land in FUA #1 for future development of an elementary school, a middle school and a high school.

AUSD funds the construction of new schools through a combination of Mello-Roos Community Facilities Districts and the state funding program. Sites are acquired through a land bank, which secures land well in advance of facilities needs in order to reduce the cost later on.

(2) Brentwood Union Elementary School District (BUESD). The BUESD currently operates three elementary schools (Kindergarten through fourth grade) and two middle schools (one with grades 5-6 and one

with grades 7-8). A site for one additional elementary school has been purchased, and planning is currently underway. The district does not fix attendance boundaries for its elementary schools; instead, it permits students to attend the school of their choice as long as capacity is available. Staff note that students typically attend the nearest school.

BUESD funds new construction through development fees, under a development agreement with builders active in the area. The fee is currently about $5,500 per housing unit. The District participates in the same land bank as AUSD.

(3) Liberty Union High School District (LUHSD). LUHSD provides high school education to the area served by BUESD. The district currently operates one high school. A second school is planned; the district is currently soliciting bids for its construction and expects the school to be operational for the 1997-98 school year.

III.H.2 Impacts

a. Police Protection. Adoption of the proposed plan itself would have no impact on the demand for police services. Development permitted by the plan would increase the demand for police staff.

The staff increases that would be required to maintain the current level of service (1.13 officers per 1,000 residents), achieve the General Plan standard (1.2 officers per 1,000 residents) and City Council-adopted target (1.39 officers per 1,000) are shown in Table 25.

Table 25

Additional Police Personnel Required by the Proposed Plan
(with 1,322 housing units and a population of 3,843)[a]

Additional Staff Required per 1,000 Residents:	Sworn Officers	Civilian Personnel[b]	Total
1.13	4.3	1	5
1.20	4.6	1	5
1.39	5.3	1	6

[a] Average of 2.9 persons per household for single family units.
[b] One civilian per four sworn officers.

Source: Mundie & Associates, based on information provided by the City of Antioch

Impacts on the demand for public services, including police protection, are considered by CEQA to be significant if they result in a physical change in the environment. Because the Antioch Police Department facility would not have to be modified to accommodate the expected increase in staff, the impact of development permitted by the proposed plan would be less than significant. A separate fiscal study is being prepared to address the issue of operating costs.

b. Fire Protection. Adoption of the proposed plan itself would have no impact on the demand for fire protection services. Development permitted by the proposed plan would increase the demand for fire district staff.

(1) **[Impact H1]** ***Development allowed by the proposed plan would require the construction of new facilities and the possible expansion of existing facilities.***

The EIR on the Antioch *Infrastructure Plan* indicates that not all of the proposed plan area lies with the 1.5 mile response contours of existing and planned facilities. The *Infrastructure Plan* EIR further indicates that development of FUA #2 will require the construction and staffing of an additional fire station. The Specific Plan designates a site for this station at the northwest corner of Lone Tree Way and Sand Creek Road. When the entire area is built out, this station would be equipped with an engine and an aerial ladder truck, and would thus require staffing by two crews (a total of 22 personnel).

At buildout of the Specific Plan, fire protection fees collected by the CCCCFD would total an estimated $747,305.

(2) **[Impact H2]** ***Commercial and industrial development would require water flow for fire protection.***

Commercial development permitted by the proposed plan could require a maximum water supply of 4,000 gallons per minute (gpm) for a duration of four hours. Additional flows might also be required, depending on the type of industrial development located in the area. Although light industrial development would not necessarily pose more risks than commercial development, heavy industrial uses such as factories are considered high-hazard and would require water flows greater than 4,000 gpm.

c. Parks and Recreation. To meet the city's standard for park land (five acres per 1,000 resident) would require approximately 20 acres of park land (based on an estimated population of 3,843).

The proposed plan includes a neighborhood park of approximately 9 acres. In addition to the designated park site, the proposed plan includes approximately 34 acres that will be used for a detention basin (Lindsay Basin). If at least 8.4 acres of the basin are developed for active park use, the Specific Plan would meet the city's standard. Although a final plan for development of the basin has not yet been prepared, the city intends to develop as much as 20 acres of this site for park use.

d. Schools. Development under the proposed Specific Plan would increase enrollment in the three school districts serving the area.

(1) **[Impact H3]** ***Project buildout would increase enrollment in the Antioch Unified School District, the Brentwood Unified Elementary School District and the Liberty Union High School District. In some cases, the provision of additional schools and/or classrooms would be required.***

Residential development in FUA #2 would be divided between the AUSD and the BUESD/LUHSD. Approximately half of the housing units would be located in each district. Using students per household estimates provided by the respective school districts, it is estimated that the Specific Plan would yield a total of 878 new students: 528 at the elementary school level, 211 at the middle school level and 139 at the high school level. These estimates are detailed in Table 26.

The number of classrooms that would be needed in each district to accommodate these students is calculated in Table 27. Discussions of the projected impact on each of the districts follows Table 27.

(a) AUSD. AUSD estimates that each new housing unit will have, on average, 0.75 students attending the public schools. The district further estimates that these students are distributed among grade levels as follows: 0.45 elementary school students per unit, 0.17 middle school students per unit and 0.13 high school student per unit.

Table 26

Estimated Student Yields from Development of the Specific Plan Area

	Total	AUSD		Brentwood		Liberty	
Housing Units	1,322	661		661		661	
Student Count		*per Household*	*Total*	*per Household*	*Total*	*per Household*	*Total*
Elementary	528	0.45	297	0.35	231	0	0
Middle	211	0.17	112	0.15	99	0	0
High	139	0.13	86	0.00	0	0.08	53
Total	878	0.75	495	0.50	330	0.08	53

Source: Mundie & Associates, based on interviews with school district staff

Table 27

Additional Schools Needed to Accommodate New Students

		AUSD	Brentwood	Liberty
Elementary	Students	297	231	0
	Students/Classroom	29	29	0
	Classrooms	11	9	0
Middle	Students	112	99	0
	Students/Classroom	26.6	30	0
	Classrooms	5	4	0
High	Students	86	0	53
	Students/Classroom	26.6	0	28
	Classrooms	4	0	2

Source: Mundie & Associates, based on interviews with school district staff

Based on these "student yields," the residential development permitted by the Specific Plan would generate a total of 495 new students in the AUSD attendance area: 297 in elementary school, 112 in middle school and 86 in high school. These estimates are higher than the 300 total students assumed in the district's 1993 *Master Facilities Plan.*

The number of classrooms needed to accommodate new students is estimated based on standards for class sizes. According to a contract between the AUSD and the Antioch Education Association (AEA), which is the local teachers' bargaining unit, class sizes in District schools may not exceed 31.0 in kindergarten classes,

27.0 in grades 1 through 3, 30.5 in grades 4 through 6 and 26.6 in grades 7 through 12. Preferred enrollment capacities, based on single track year-round education, are 750 to 1,000 students per elementary school, 1,350 per middle school and 3,000 per high school.

Based on average classroom sizes, the new students would require 20 additional classrooms: 11 at the elementary school level, 5 at the middle school level and 4 at the high school level. These estimates are calculated in Table 27. The District has indicated that it would need an elementary school to accommodate the increased enrollment at that level, but could shift attendance boundaries to accommodate middle school and high school students in existing facilities.

The Specific Plan includes an elementary school site of 11.3 acres within the boundaries of the AUSD. Therefore, the impacts of the plan would be limited to the need to construct a school facility on the site that is reserved in the plan.

(b) BUESD. The Brentwood Union Elementary School District estimates that each new housing unit in the district yields 0.35 students at the elementary school level and 0.15 at the middle school level, for an overall average of 0.5 total students per unit. These student yields would produce a total of 330 new students from FUA #1, with 231 in elementary school and 99 in middle school.

BUESD has class size standards of 28 students per class in grades K through 3 and 30 students per class in grades 4 through 8. Elementary schools are intended to accommodate up to 650 students, and middle schools up to 800 students. Based on these standards, the District would require nine additional elementary school classrooms and 4 additional middle school classrooms to accommodate the students who would live in FUA #2.

The district has adequate capacity in its middle schools for students expected to live in FUA #2, but would need an additional elementary school for students in kindergarten through fourth grade. FUA #2 is not part of the development agreement under which residential developers pay impact fees to the district.

(c) LUHSD. The Liberty Union High School District expects that each new housing unit will accommodate 0.08 high school students. The residential development in FUA #2 would therefore produce 53 new students for the district.

LUHSD has an average class size of 28 students. FUA #2 residents would be accommodated in two new classrooms.

The new high school, which will be operational for the 1997-98 school year, will have capacity for 1,600 students in Phase 1 and 2,200 students at completion. This capacity is expected to be sufficient to accommodate the 53 students who would live in FUA #2.

The proposed plan could result in significant impacts on fire protection services and local schools.

III.H.3 Mitigation Measures

Impact H1 Development allowed by the proposed plan would require the construction of new facilities and the possible expansion of existing facilities.

Mitigation Measure H1 Incorporate Fire District planning and financing mechanisms into the Specific Plan and development process.

Projects within the Specific Plan area shall pay CCCCFD fees applicable at the time development proceeds. Incorporate CCCCFD planning input into project design and approval to ensure that adequate provisions are made for access, water supply and compliance with Fire Code requirements. Coordinate the timing of development in the Specific Plan area with CCCCFD construction and staffing of new stations, in order to prevent excessive response times and the depletion of resources that serve existing development.

Impact H2 Commercial and industrial development would require water flow for fire protection.

Mitigation Measure H2 The proposed plan specifies the appropriate water main sizes to deliver flows at the required rate.

Impact H3 Project buildout would significantly increase enrollment, requiring the provision of additional schools and/or classrooms.

Mitigation Measure H3a Accommodate increased enrollment by a variety of strategies, including provision of portable facilities, year-round education, double sessions and construction of new facilities.

Mitigation Measure H3b Require the portions of FUA #2 that are within the AUSD to join the current AUSD Mello-Roos Community Facilities District or provide an alternate funding mechanism for construction of school facilities.

Mitigation Measure H3c Require the portions of FUA #2 that are within the BUESD to join the existing development agreement with the school district or provide an alternate funding mechanism for construction of elementary and middle school facilities.

Mitigation Measure H3d Require the portions of FUA #2 that are within the LUHSD to provide a funding mechanism for construction of high school facilities.

Implementation of these measures would reduce impacts on public services to a less-than-significant level.

III.I INFRASTRUCTURE[59]

III.I.1 Setting

The proposed project (the Specific Plan for FUA #2) is consistent with the land uses addressed by the *Antioch Infrastructure Plan* and its EIR. The *Infrastructure Plan* evaluated the need for roads, water supply and conveyance systems, wastewater treatment and sanitary sewers and storm drainage for both of Antioch's Future Urbanization Areas (FUA #1, now referred to as the Sand Creek Planning Area, of approximately 2,700 acres and FUA #2, of approximately 800 acres) prior to annexation of these areas to the City of Antioch.

This section describes the infrastructure required to support the proposed project and covers onsite roads, water, sanitary sewer, electric, gas, phone and CATV. Relocation of existing utilities is also included. Storm water and runoff quality and quantity issues are discussed in Section III.F of this chapter.

a. Local Roads. The existing (offsite) road network is described in detail above (Section III.B). Anticipated local roadway extensions into the planning area include Laurel Road, Country Hills Drive, Canada Valley Road and Vista Grande Drive. Lone Tree Way is planned to be widened from its present two-lane width to a six-lane arterial along the southerly boundary of the planning area. The extent of improvements to Empire Avenue along the eastern edge of the planning area will depend on land use to the east (in Future Brentwood) and parcel orientation within the planning area.

Two new major roadways are expected to serve the planning area. One is a freeway extension, commonly known as State Route 4 Bypass (SR 4 Bypass), which bisects the planning area in a north-south direction. Two interchanges are proposed for SR 4 Bypass; one is located at Laurel Road and the other one at Lone Tree Way. The second new roadway is Sunset Drive, which runs north-south, paralleling the SR 4 Bypass alignment. This new roadway is being planned (as an arterial south of Laurel and a collector north of Laurel) to ultimately extend northerly under the SR 4/160 interchange and continue westerly, to Hillcrest Avenue (see Figure 27).

The arterial and collector roadways of Laurel Road, Lone Tree Way, Jacuzzi Road, Country Hills Drive, Canada Valley Road and Sunset Drive will become the corridors within the planning area for trunk sewer, water, storm drainage, electricity, gas, phone and CATV infrastructure.

b. Domestic Water Supply. Currently, the planning area is being served by private wells and irrigation water supplied by the East Contra Costa Irrigation District (ECCID). Approximately 175 acres on the southerly end of the planning area are within the ECCID.[60]

The planning area has been annexed to the Contra Costa Water District (CCWD), which, historically, has been the primary provider of raw water (via the Contra Costa Canal) to the City of Antioch for treatment and distribution. CCWD has contractual entitlements from the United States Bureau of Reclamation (USBR) for up to 195,000 acre feet of Central Valley Project (CVP) water, taken from the Delta at Rock Slough pursuant to Water Rights Permits 12725 and 12726.

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59 Background information, analysis of impacts, recommendation of mitigation measures and draft graphics for the *Infrastructure* section have been prepared by McGill·Martin·Self.

60 East County Water Supply Management Study Phase 1 - Supply and Demand (Contra Costa Water District, January 5, 1994).

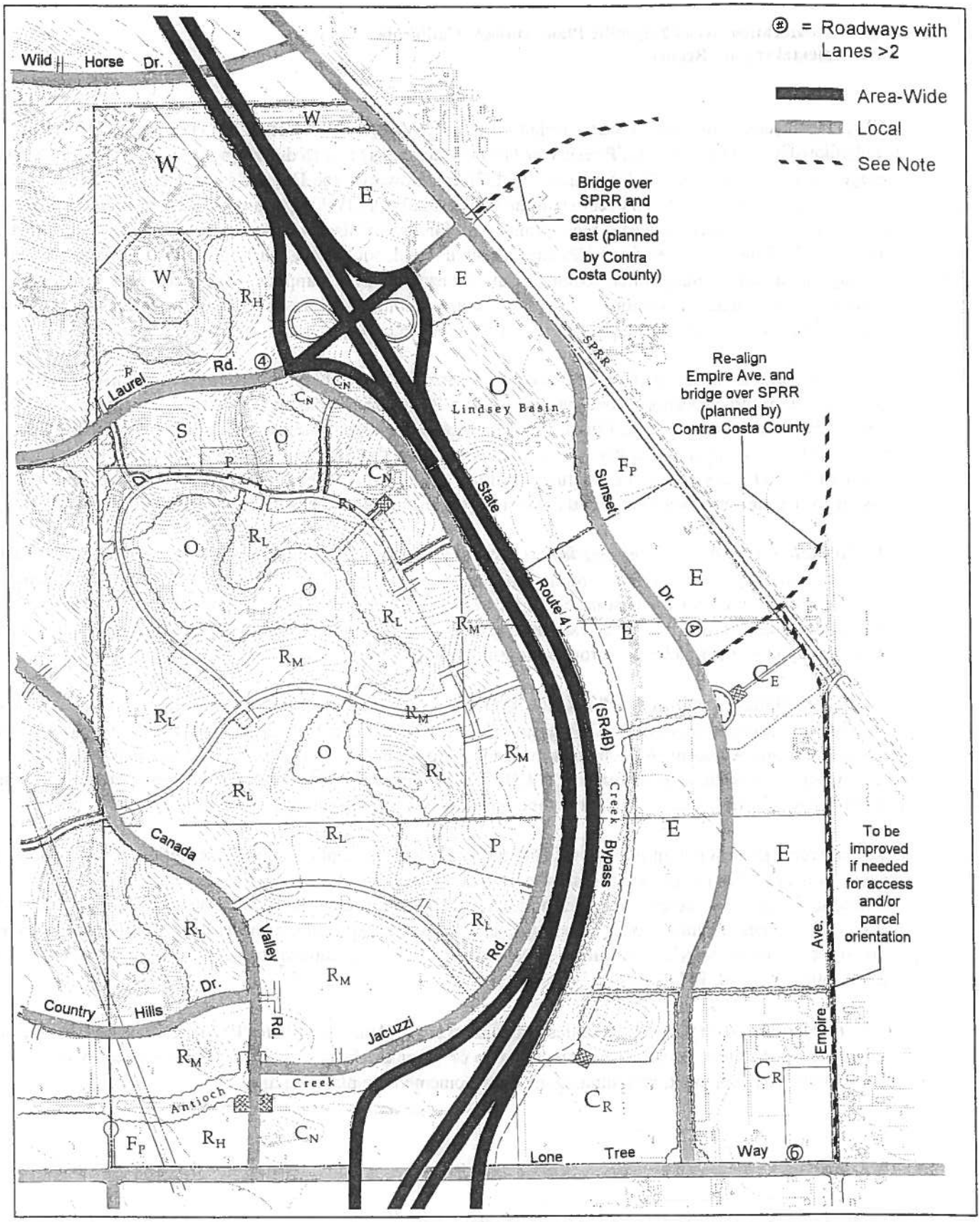


Figure 27

Local Roads

0 500 1000 2000

Antioch Future Urbanization Area #2

CCWD has recently received the water rights for the Los Vaqueros Project (LVP) (Permits 20749 and 20750) which allow CCWD to fill the LVP reservoir (100,000 acre feet) and to divert up to 242,000 acre feet/year for storage and direct use from Rock Slough or Old River. However, the District's contract with USBR contains the following limitations: "in no event shall the total quantity of CVP water and the Los Vaqueros water rights water within the District Service Area, in any year for use by its customers, exceed 195,000 acre feet".[61] Based on planning studies[62] for LVP and potential build out within existing CCWD boundaries and its planning jurisdiction, future water demands can be met with CVP supplies, except in years which result in shortages in the annual allocation. The LVP studies assumed certain reclamation and conservation levels without which there would not be sufficient CVP supplies in normal years.

The City of Antioch is responsible for providing treated water to the planning area. Currently, the City can draw water from three sources: from the San Joaquin River (impounded at the Antioch Municipal Reservoir), from CCWD at the Contra Costa Canal and from local wells within the city limits (for construction purposes only). Up to 6.3 mgd of Antioch's raw water comes from the San Joaquin River which is limited only by water quality and the capacity of existing facilities. Whenever water quality problems result in Antioch's drawing river water on fewer than 208 days in a year, the state subsidizes its cost for CCWD water.

(1) Antioch's Water Treatment Plant. Presently, the City of Antioch's Water Treatment Plant (WTP) has a maximum capacity of 26-28 million gallons per day (mgd). In 1994, the maximum daily demand for water topped 21.0 mgd for the first time. The current configuration of the existing WTP allows for potential expansions to over 60 mgd.[63] These expansions, when accomplished, will be adequate to supply the projected maximum-day demand anticipated through the year 2030.

(2) CCWD Water Treatment Plant. CCWD's Randall-Bold Plant (RBP), immediately east of FUA #2, currently has a capacity of 40 mgd: 25 mgd available to CCWD and 15 mgd to Diablo Water District (DWD) per a Joint Powers Authority Agreement between the two agencies. This plant can be expanded up to 80 mgd (which would be allocated as follows: CCWD 50 mgd and DWD 30 mgd) to meet projected growth within Eastern Contra Costa County. The maximum daily demand for water was 6.7+ mgd in 1994.[64]

Based on recent growth within the City of Antioch and estimates of per capita consumption, the existing WTP capacity is expected to be reached around the year 2000. If demand continues as estimated, by 1997 the City will need to determine whether to expand the existing WTP or purchase additional treated water from CCWD. There is adequate lead time to allow for design, bidding and construction of necessary treatment expansion or an intertie between the City's distribution system and RBP.[65] The water distribution system has been planned to allow either, or both, WTPs to supply water.

(3) Water Zones. The planning area lies within the City of Antioch's Water Pressure Zone III East, serving elevations up to 235 feet. Zone III East is made up of water trunk lines which have been sized to serve existing and planned development, including future development in the planning area.

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61 Personal conversation with Greg Gantrell, CCWD, March 10, 1995.
62 East County Water Supply Management Study Phase 1 - Supply and Demand (CCWD, January 5, 1994).
63 Personal communication with John Billeci, Plant Superintendent for Antioch's Water Treatment Plant, March 9, 1995.
64 Personal conversation with Greg Gantrell, CCWD, March 10, 1995.
65 Water System Master Plan Update for the City of Antioch (Brown and Caldwell Consultants, July 1991).

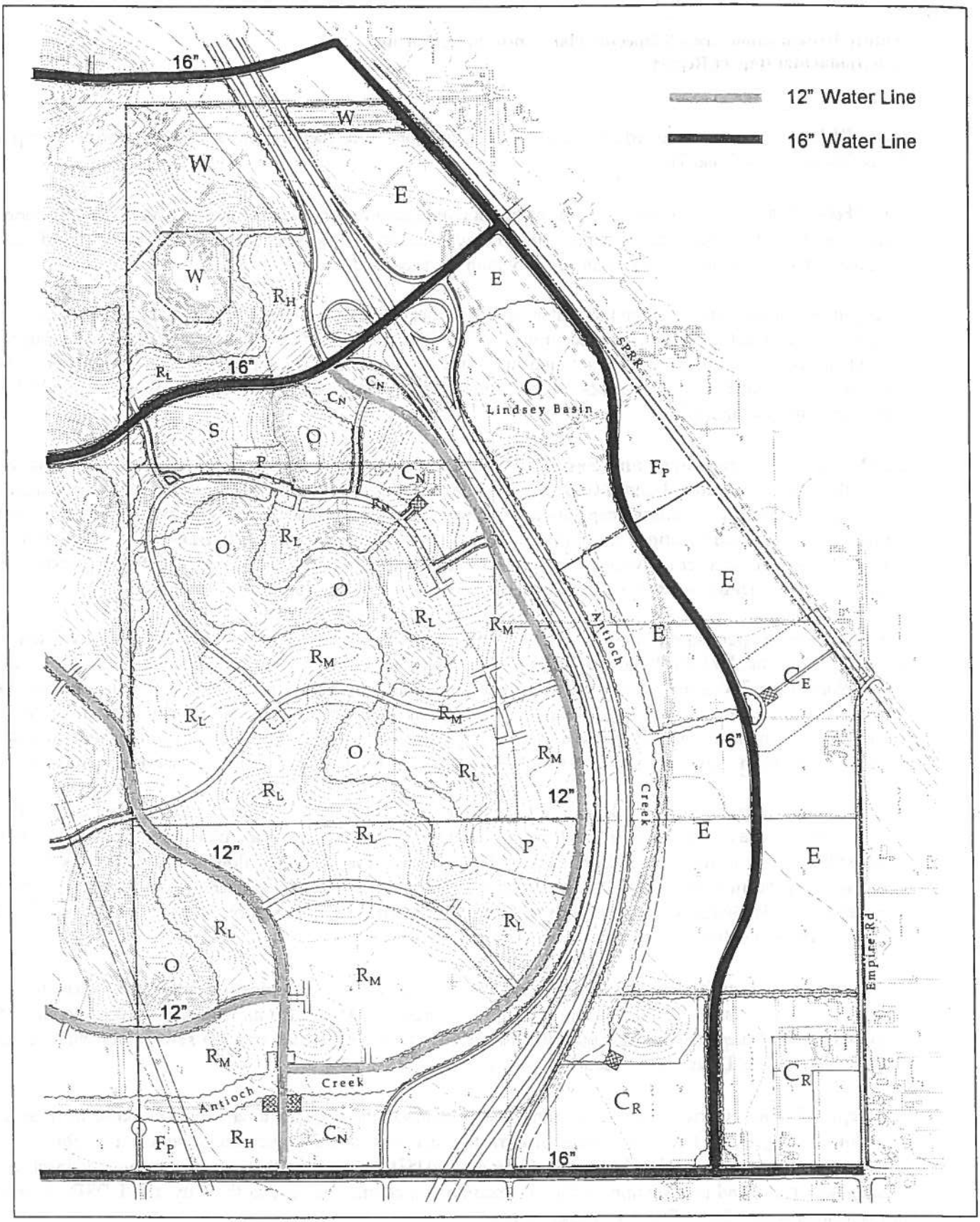


Figure 28

Water Supply Lines

0 500 1000 2000

Antioch Future Urbanization Area #2

Zone III East is currently served from two reservoirs (Lone Tree and Deerfield) and two booster pump stations (Hillcrest and Lone Tree).

(4) Water Mains. Water network improvements anticipated to serve the planning area are: (1) the pipeline extensions within Laurel Road, Country Hills Drive, Canada Valley Road and Lone Tree Way and (2) the construction of a new north-south water main within the proposed Sunset Drive.

These improvements are based on the Water System Master Plan[66] which addresses land uses and unit counts which are consistent with the proposed project. The Water System Master Plan addresses the adequacy of existing/proposed facilities and their relationship to the proposed land use mixes, buildout assumptions, water pressure zones and flow requirements. The recommended water main sizes from the Water System Master Plan are shown in Figure 28.

c. Wastewater Treatment and Sanitary Sewers. The planning area is within the service boundaries of the Delta Diablo Sanitation District (DDSD). In 1990, DDSD completed construction of treatment expansion to increase the district's operating capacity to 16.5 mgd. The unincorporated area known as Bay Point and the Cities of Pittsburg and Antioch currently discharge approximately 12.0 mgd. DDSD's next expansion is planned for sometime after the year 2000. Due to future growth potential for both the Cities of Pittsburg and Antioch, the District has recently embarked on a Conveyance System Master Plan Update.

Approximately 90 percent of the wastewater flow from the existing City of Antioch is conveyed by a series of gravity lines to the Antioch Pump Station on Fulton Shipyard Road, where effluent is pumped to the Diablo Delta Wastewater Treatment Plant (WWTP). The remaining 10 percent of wastewater flow is directed to the Delta Diablo WWTP via a gravity interceptor. Currently, Antioch's Southeast Area wastewater flows are conveyed to a pump station at Hillcrest and Lone Tree Way by a series of gravity and force mains, where the sewage is pumped northward along Hillcrest Avenue where it gravity flows to the Antioch Pump Station.

A new sanitary sewer gravity trunk line to serve the Southeast Area is planned to be constructed in 1996 or 1997. This new gravity sewer main has been designed to handle flows from the planning area. This improvement will extend a gravity sewer from the Hillcrest Pump Station easterly along Lone Tree Way (into the planning area), north along Empire Avenue and Southern Pacific Railroad (SPRR) (then out of the planning area) and along Highway 4 to the recently completed Bridgehead Pump Station. There, wastewater will be pumped to the Antioch Pump Station.

(1) Sanitary Sewer Trunk Lines. Sewer trunk lines, extensions and pipelines planned to serve the area include: (1) a north-south sewer line within the proposed Sunset Drive; (2) an east-west sewer line under the proposed SR 4 Bypass connecting Country Hills Drive with Sunset Drive; and (3) sewer lines within Laurel Road, Country Hills Drive and Canada Valley Road.

(2) Septic Tanks. Currently, there are homes and ranches in the planning area, which could be integrated as a part of this project, or, due to the timing of infrastructure improvements, remain on septic tanks for a period of time. The City of Antioch's Municipal Code and DDSD code states that properties must connect to an existing sewer line and pay the appropriate annexation and connection fees to the City and DDSD, when the line is located within 200' of their residence or use.

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66 Ibid.

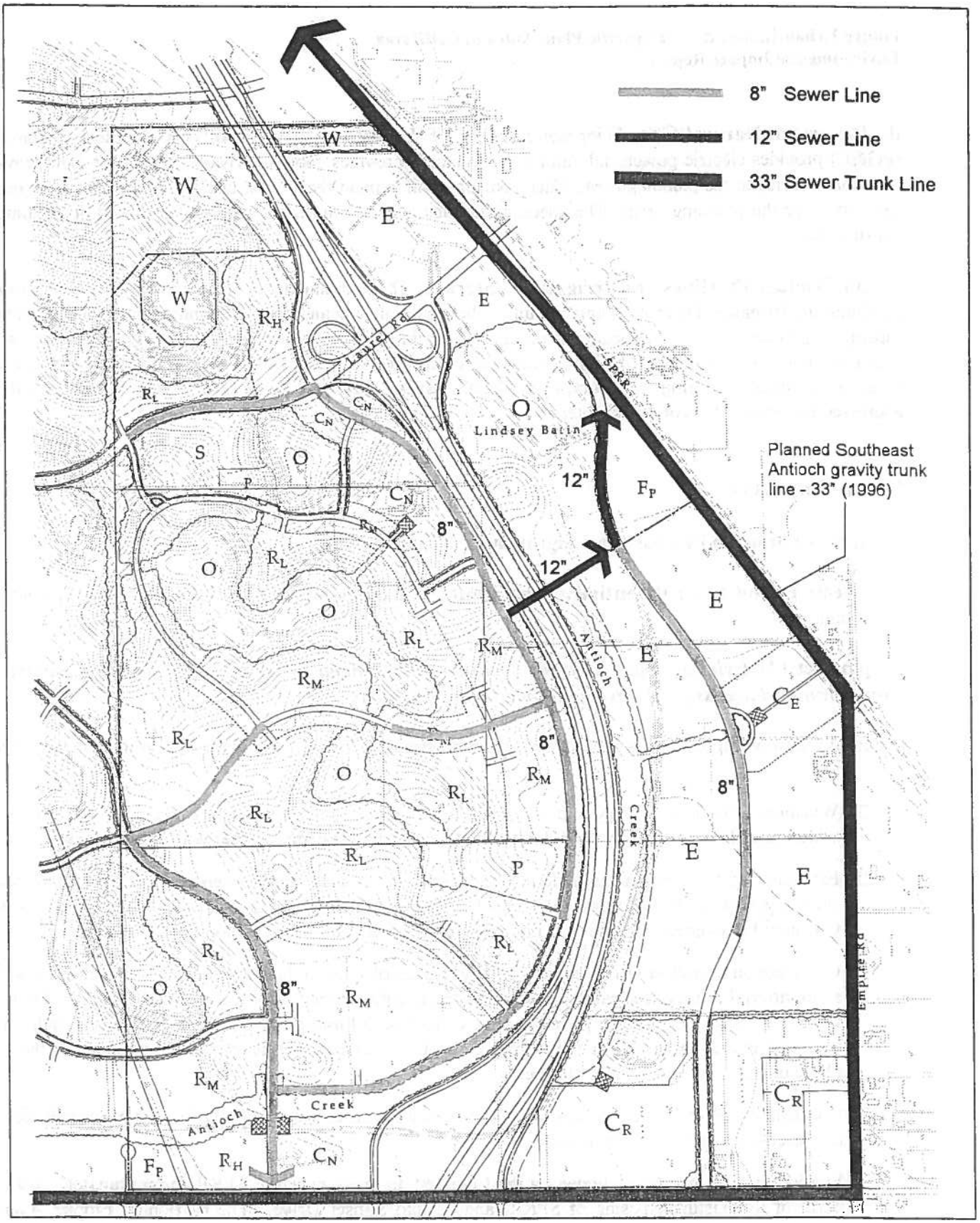


Figure 29

Sanitary Sewer Lines

Antioch Future Urbanization Area #2

d. Electrical, Natural Gas, Telephone and CATV Services. The Pacific Gas and Electric Company (PG&E) provides electric power and natural gas, Viacom provides cable television and Pacific Bell provides telephone service to the planning area. Each company will expand their lines, cables, facilities, etc., as necessary, to serve the planning area. The specific facilities and detailed costs will be determined at the time of construction.

e. Oil Product Pipelines and Irrigation Laterals. The planning area contains underground oil product pipelines and Irrigation District laterals within public rights-of-way and operating and maintenance easements. Pipelines and laterals will be relocated, if necessary, within or adjacent to nearby roadway improvements. In addition, there may be cases in which pipelines are not in recorded easements or have been abandoned and will need to be removed during construction. (Health issues related to pipeline relocation and removal are addressed in Section III.G of this chapter).

III.I.2 Impacts

a. Effects Found to be Less than Significant. None identified.

b. Effects Found to be Potentially Significant. Five effects of the Specific Plan would be potentially significant.

(1) [Impact I 1] ***Existing local roadway facilities would need to be extended and new vehicular circulation and access facilities would need to be provided.***

The local roadway improvements needed for the planning area are shown in Figure 27 and include the following:

- Widening of Lone Tree Way to a six-lane arterial along the southern edge of the planning area. The widening of Lone Tree Way should facilitate the interchange configuration with SR 4 Bypass.
- Extension of Laurel Road as a four-lane arterial, continuing northeasterly, through a future interchange with the SR 4 Bypass, to Sunset Drive. Ultimately, this road is planned (by Contra Costa County[67]) to connect with existing Laurel Road to the east to serve development in Oakley.
- Construction of Sunset Drive, initially as a two-lane collector and ultimately as a new four-lane north-south arterial to serve the easterly portion of the planning area. This roadway will carry traffic from Lone Tree Way, through the planning area, connecting ultimately to Hillcrest Avenue. Initially, this road will extend just north of the Contra Costa Canal and can be temporarily connected to the first phase of the SR 4 Bypass interchange.
- Construction of collector roadways (Canada Valley Road, Country Hills Drive and Jacuzzi Road) on a project-by-project basis as needed.
- Empire Avenue may be realigned by the County[68] to cross over the SPRR (approximately 500 feet north of its existing crossing of SPRR) and tie into Sunset Drive. The portion of Empire Avenue

67 Lowell Tunison, Contra Costa County, personal communication with McGill·Martin·Self.
68 Ibid.

south of the realignment may need to be improved depending on land uses to the east (in future Brentwood) and parcel orientation within the planning area.

- Improvements (in conjunction with each of the above listed facilities) for bike and pedestrian circulation, transit (bus turnouts, etc.) and parking.

The Specific Plan would create impacts on local roadways which would result in the need for new facilities in addition to improvements of existing facilities.

(2)* [Impact 12] *Domestic water supply infrastructure would need to be extended for water storage, pumping and conveyance.

Additional water supply improvements will be located both inside and outside the planning area. Planning area improvements can be sequentially provided to meet development demand.

Water supply improvements needed for the planning area include the following (see Figure 28):

- Extension of the 12" water lines within Country Hills Drive and Canada Valley Road
- Extension of the 16" water lines within Laurel Road and Lone Tree Way to their intersection with Sunset Drive
- Construction of a 16" water line within Sunset Drive from Wild Horse Road south to Lone Tree Way
- Construction of a 12" water line within Country Hills Drive Road

Adequate water supply is available to serve the planning area. The implementation of future supply will require planning and decisions which anticipate planning area development timing.

The project will create the need to improve domestic water supply facilities both inside and outside of the planning area, including extension of existing facilities and construction of new apparatuses.

(3)* [Impact 13] *Sewer lines ranging in size from 8" to 12" would need to be extended to form a comprehensive collection system.

Sewer trunk lines will gravity flow within the planning area and connect to the new Southeast gravity trunk line. The sewer trunk system should be constructed with the arterial and collector roads and is shown in Figure 29.

Project development will result in the need for sewer line extensions.

(4)* [Impact 14] *Development of the planning area will increase the demand for electrical, natural gas, cable and telephone services.

Improvements to meet these demands include the provision of "Joint Trench" facilities, generally constructed with the arterial and collector roadways.

Increased demand for electrical, natural gas, cable and telephone service will result from development of the project.

(5)* [Impact I5] *Existing oil pipelines and irrigation laterals may need to be relocated during the course of roadway improvements, where feasible.

Coordination will need to take place with affected pipeline operators to ensure proper alignment, connections, easement and access requirements. Where the pipelines are not to be relocated within the roadways, provisions should be made to procure easements and to protect and ensure the integrity of the pipeline. Health issues related to the relocation, installation and abandonment are covered within Section III.G.

Existing oil pipelines and irrigation laterals may have to be relocated when roadway improvements are initiated.

III.I.3 Mitigation Measures

Mitigation measures include actions that would address project impacts on local roadways, domestic water supply, wastewater treatment and sanitary sewer; electrical, natural gas, telephone and CATV services; and, oil product pipelines and irrigation laterals.

Impact I1 Existing local roadway facilities would need to be extended and new vehicular circulation and access facilities would need to be provided.

Mitigation Measure I1a Completion of roadway improvements including:

- Widening Lone Tree Way to a six lane arterial
- Extending Laurel Rd. as a four lane arterial
- Construction of Sunset Dr. as a new four lane arterial
- Construction of collector roadways on an as-need basis
- The possible realignment of Empire Ave.

(See Chapter III.I.2 (1) for a more detailed description of these improvements.)

I1b Provision of access and circulation routes to specific parcels.

I1c Compliance with City and State standards (or as modified by Specific Plan guidelines) in circulation and parking design and construction, including, but not limited to, parking standards, handicap requirements, fire equipment access, site distances, etc.

Plans for extension and/or upgrading of public roads and for design and construction of internal driveways, circulation and parking facilities, shall be submitted to the City of Antioch Department of Community

Development (ADCD), Engineering Division, for review and compliance with City requirements and standards.

Impact I2 Domestic water supply infrastructure would need to be extended for water storage, pumping and conveyance.

Mitigation Measure I2a Construction of water system improvements including:

- Extension of the 12" water lines within Country Hills Dr. and Canada Valley Rd.
- Extension of the 16" water lines within Laurel Rd. and Lone Tree Way
- Construction of a 16" water line within Sunset Dr.
- Construction of a 12" water line within Jacuzzi Rd.
- Addition of pump(s) to the existing Zone III East pump station(s)

(See Chapter III.I.2 (2) for a more detailed description of these improvements.)

I2b Compliance with City design and construction standards, including connections as required by the City of Antioch's ADCD, Engineering Department and internal water distribution plans meeting City standards for various land uses, fire flows and landscape needs. Compliance with City design standards.

City review and approval of water plans is required and the Contra Costa Fire Protection District should be consulted relative to the required fire flows and access.

Recycling of wastewater or the use of surplus Irrigation District water or raw river water may be considered for the planning area. This type of water recycling to service future demands should be explored in greater detail.

Impact I3 Sewer lines ranging in size from 8" to 12" would need to be extended to form a comprehensive collection system.

Mitigation Measure I3a Extension of sewer lines ranging in size from 8" to 12"

I3b Compliance with City design and construction standards, including incorporating sewer connection requirements, manholes and any other needed improvements in the overall design and submitting those plans for City review and approval.

I3c Designing internal sewer collection system to address City, State and Federal standards regarding disposal of hazardous materials (from the commercial sites) and submitting plans for such systems to the appropriate responsible agency, as identified under Section III.G.

Impact I4 Development of the planning area will increase the demand for electrical, natural gas, cable and telephone services.

Mitigation Measure I4 Development applicants shall provide documentation to the City that these services can be provided for all phases of the project in a timely manner. Applicants shall coordinate with the utility companies and the City in planning and scheduling future facilities for the Planning Area. All utilities shall be located below grade and designed according to the City of Antioch's street and infrastructure guidelines.

Impact I5 Existing oil pipelines and irrigation laterals may need to be relocated during the course of roadway improvements, where feasible.

Mitigation Measure I5 Development applicants shall coordinate with the pipeline and irrigation companies and appropriate Health and Safety Agencies with regard to the design, timing, access and easement requirements related to respective utility relocation.

Mitigation of the potential impacts to local roadways, the water supply and sewer systems, other utilities and pipelines consists of implementing the measures outlined above. Once implemented, these measures would reduce potential impacts to less-than-significant levels.

III.J VEGETATION AND WILDLIFE[69]

III.J.1 Setting

a. Introduction. This section summarizes existing vegetation and wildlife conditions within the study area and evaluates potential impacts on these resources from development allowed under the proposed specific plan. As with most of the topical analyses in Chapter III, it builds on environmental research and analysis undertaken for the *Infrastructure Plan EIR.*

A full description of the planning area's vegetation and wildlife is presented as part of a technical background report that has been prepared for this EIR. That technical background report is attached as Appendix E to this EIR. Rather than reiterate that report's detailed presentation of biotic habitats and lists of plant and animal species identified within the study area, the following *Setting* materials provide a summary of these findings, focusing on those resources that relate to the potential *Impacts* discussed in that section which follows.

b. Methodology and Overview. The study summarized in this section of the EIR has been based on a thorough review of existing information about the biotic resources of northern Contra Costa County and reconnaissance level field surveys. Background information included regional and state databases, planning documents prepared for local projects and scientific literature relevant to biotic resources of the region. Several individuals with particular knowledge of the local flora and fauna were also contacted. Reconnaissance level surveys for biological resources were conducted throughout the study area during July and August, 1991, October and December, 1993 and March, 1994. A supplemental survey focusing on wetlands was conducted 1 August 1995 (discussed below). These surveys were conducted at a level sufficient to identify and map the biotic habitats of the planning area, locate its sensitive habitats such as wetlands and assess the suitability of its biotic habitats for special status plants and animals. Specific surveys for special status plants and animals were not conducted. Conclusions about the potential for such species to occur on the site have been based on their known regional occurrence, the suitability of habitats of the study area and the accessibility of the study area.

Historic land uses, including cattle grazing and agriculture, have substantially modified the native habitats of the study area. Little remains of the native flora. Non-native grassland is the primary biotic community, although portions of the site have been converted to row crops and orchards. The value of existing habitats to native wildlife has been reduced by agricultural practices and commercial and residential development located offsite to the north and west.

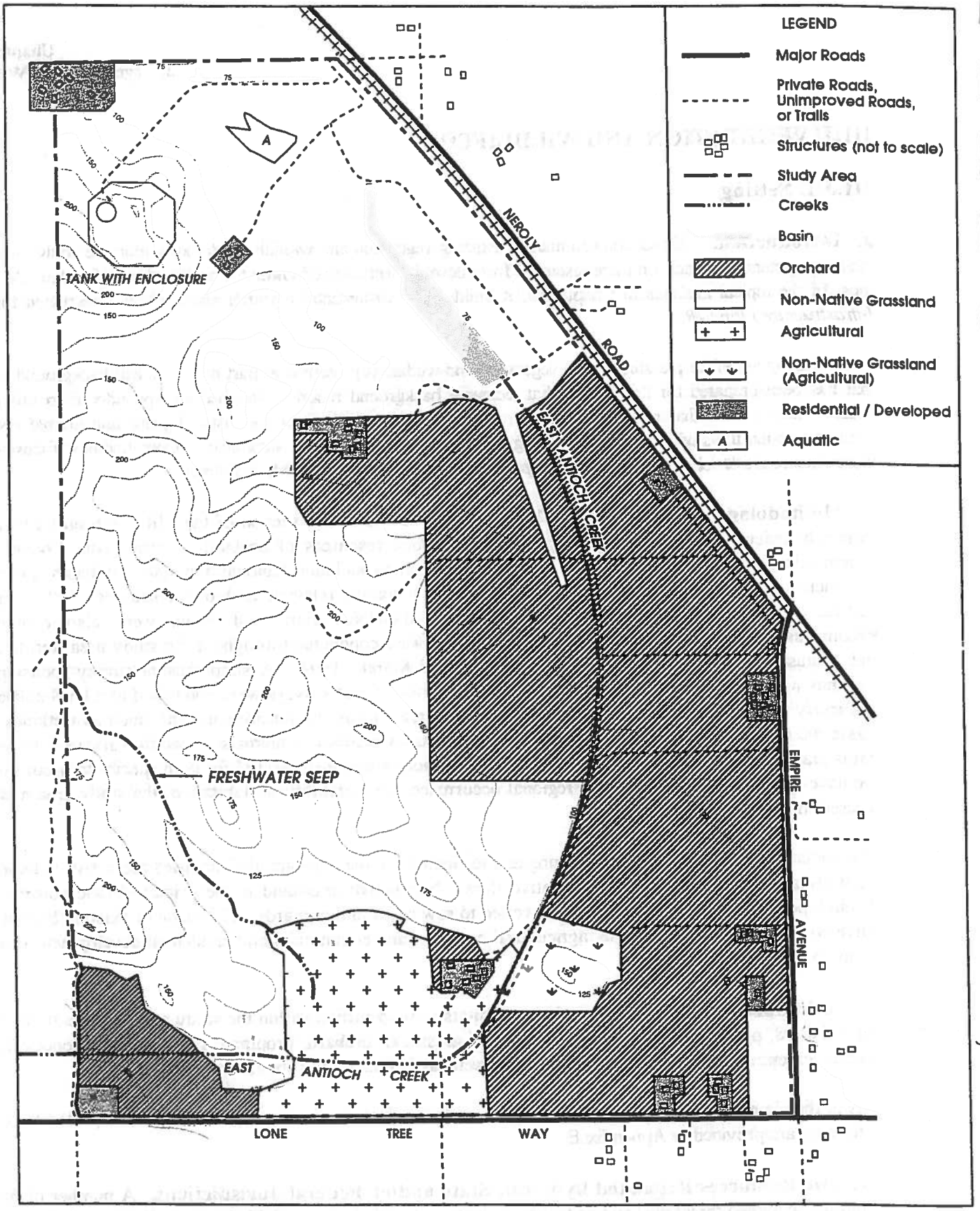
b. Biotic Habitats. Seven different biotic habitats were identified within the study area (Figure 30, p. 134, and Table 28, p. 135). These include non-native grassland, orchard, cropland, residential/developed, fresh-water emergent vegetation, aquatic and seasonal wetland (discussed in subpart c, below).

Lists of the plant and vertebrate species observed on the project site during field surveys, or expected to occur on the site, are provided in Appendix E.

c. Biotic Resources Regulated by Local, State and/or Federal Jurisdictions. A number of biotic resources, including threatened and endangered plants and animals or special habitats (such as wetlands) are

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69 Background information, analysis of impacts, recommendation of mitigation measures and draft graphics for the *Vegetation and Wildlife* section have been prepared by H.T. Harvey & Associates.



Source: H. T. Harvey & Associates

Figure 30

Biotic Habitats

0 500 1000 2000

Table 28

Areal Extent of Biotic Habitats

Habitat Type	Acres[a]	Percent of Total
Non-native Grassland	454.3	57.9%
Orchard	265.7	33.9%
Cropland	45.1	5.7%
Residential/Developed	10.8	1.4%
Freshwater Emergent Vegetation	3.9	0.5%
Aquatic	2.9	0.4%
Seasonal wetland	1.7	0.2%
TOTAL	784.4	100.0%

[a] Independently rounded to nearest tenth of an acre.

Source: H.T. Harvey & Associates

protected by local ordinance or state or federal statute. These biotic resources are discussed below.

(1) Drainage Channels and Wetlands. Drainage channels are considered to be "Waters of the United States". These waters are subject to the jurisdiction of the U.S. Army Corps of Engineers (Corps) according to provisions of the Section 404 of the Clean Water Act. Jurisdictional drainages include any incised channels which may carry a permanent, intermittent or ephemeral flow of water.

Wetlands are also considered to be Waters of the United States. Wetlands are identified by the presence of hydrophytic vegetation, hydric soils and wetland hydrology according to methodologies outlined in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*. Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. The resulting anaerobic conditions in these soils select for plant species adapted to those conditions. Plant species showing a high degree of fidelity to soils intermittently or permanently saturated or inundated are referred to as hydrophytes. The physical appearance of wetland habitats varies considerably from the open water of a river to the seasonal ponding of alkaline flats. Examples of wetland habitats include swamps, bogs, marshes, vernal pools, riparian woodlands and other similar areas, each supporting a flora, the dominant species of which are hydrophytes. Due to the seasonal nature of rainfall in California, some wetlands may experience soil saturation for only a few weeks out of the year.

The California Department of Fish and Game (CDFG) regulates any activities which would "divert, obstruct or change the natural flow or bed channel or bank of any river, stream or lake . . . in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit" under Sections 1601 and 1603 of the California Fish and Game Code. Such activities may be permitted within state waters, but mitigation may be stipulated according to terms of a Streambed Alteration Agreement which must be obtained from CDFG prior to commencement of work.

Reconnaissance-level surveys were conducted for areas potentially meeting the technical or regulatory criteria of jurisdictional waters. Two areas may meet the technical criteria of jurisdictional wetlands.

(a) Seasonal wetland. The first area is located in the southwestern portion of the study area along portions of a swale. Annual rainfall amounts are relatively low (approximately 10 inches), the rate of flow from the surrounding watershed is moderate, the swale bottom is composed of relatively dense clay soils, and the average slope is approximately 2 to 5 percent. Under these conditions, excess rainfall draining from the gently sloping surrounding hills has not created an incision within the drainage.

Prior to development of land situated to the northwest of this drainage, seasonal moisture was contributed to the swale from much larger watershed, primarily offsite. This upstream area is currently being developed as part of the Specific Plan for Antioch's Southeast Area. Development on the adjacent property outside FUA #2 has significantly reduced the total grassland watershed for the drainage. As a temporary measure during the development of the offsite area, a relatively large (approximately 1 acre) detention basin was designed and constructed three to four years ago in the Southeast Area upstream from the swale. This detention basin functions to temporarily collect surface runoff from the impermeable surfaces on a portion of the residential development. Water subsequently enters the historic drainage channel via reinforced metal pipes (RMP) placed at specific design elevations in the earthen berm for the basin, in effect replacing the historic grassland watershed area with runoff from the development. Once the infrastructure improvements for the development are completed, the basin is planned to be removed. With the completion of the storm drainage infrastructure and the removal of the basin, naturally-occurring runoff from the development will be channeled into a drainage system emptying directly into East Antioch Creek. Total runoff to the drainage in FUA #2 will thereby be substantially reduced.

At the present time, the impounding of water in the upstream detention basin has resulted in a temporary alteration of the character of vegetation in the swale. The area was the subject of a field reconnaissance conducted on 1 August 1995. The field investigation found characteristics of hydric soils (low chroma, soil saturation, mottling), flowing water and predominance of hydrophytic plants. Water was observed on the FUA #2 site between 2 and 3 inches deep within the upper reaches of the drainage.

The field investigation also disclosed that the swale supports hydrophytic species including Italian ryegrass (*Lolium multiflorum*), rabbitfoot grass (*Polypogon monseliensis*) and canary grass (*Phalaris* sp.). These species mature and die by the late spring in a year of average rainfall. This vegetation suggests that seasonal runoff has been sufficient, given the gentle slope of the land and the clay soils in the swale, to have resulted in the establishment of a seasonal wetland. This seasonal wetland, while of relatively poor quality, may provide higher quality forage (i.e., green and hence higher nutrient value) for a longer period of time (i.e., one to two months in normal rainfall years) than the adjacent non-native grasslands. The wildlife species that use this seasonal wetland will not differ appreciably from the adjacent non-native grasslands.

The planned removal of the upstream detention basin and the diversion of runoff from the upstream area will reduce the amount of moisture reaching the swale. Under these future conditions, the wetland conditions observed during the reconnaissance are likely to diminish in area. The reconnaissance surveys conducted for the EIR indicate that approximately 1.7 acres may be considered seasonal wetland at present, subject to the conducting of a detailed wetland delineation.

(b) Lindsey Detention Basin. Portions of a large basin located in the northern portion of the study area also met the technical criteria of jurisdictional wetlands. Judging from the presence of emergent vegetation, this pond location experiences extended periods of inundation. Depending on the circumstances of its formation, vegetated portions of this pond may be considered jurisdictional wetlands. The remainder of the pond may also be considered a jurisdictional water.

The channel of East Antioch Creek is not presently considered to be a jurisdictional water.[70]

(2) Plants and Animals of Special-Status. Several plant and animal species known to occur in the vicinity of the project site have been given special status under federal or state endangered species legislation or otherwise have been designated as sensitive by state resource agencies or professional organizations whose lists are recognized by agencies when reviewing environmental documents. Such species are referred to collectively as "species of special-status". Table 29 summarizes the listing status for these species for habitats similar to those in the vicinity of the project site.

Federally-listed threatened and endangered species and their habitats are protected under provisions of the Endangered Species Act. Death, capture and similar actions affecting individuals of threatened and endangered animal species, conversion of their habitat or other actions that may adversely affect the survival of individuals or populations may be considered a "take". Activities which may "take" individuals and actively or potentially use habitat are regulated by the Endangered Species Office of the U.S. Fish and Wildlife Service (USFWS). Candidate species on Lists 1 and 2 also receive special attention from federal agencies during environmental review. Taxa for which the USFWS has sufficient biological information to support a proposal to list as Endangered or Threatened are placed in Category 1. Taxa, the listing of which may be warranted according to existing information, but for which substantial biological information to support a proposed rule is lacking, are placed in Category 2. Some candidate species have been petitioned for federal listing. These species are often treated by resource agencies as if they were actually listed during the environmental review process.

State-listed threatened and endangered species and their habitats are protected under provisions of California's Endangered Species Act. The California Department of Fish and Game can be expected to assert jurisdiction over activities which may "take" individuals and actively or potentially use habitat.

The Department of Fish and Game has also produced three lists of "species of special concern" which serve as "watch lists". Species on these lists either are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Thus, their populations should be monitored. They may receive special attention during environmental review but do not have statutory protection.

Raptors (e.g., eagles, hawks and owls) and their nests are protected under both federal and state regulations. The federal Migratory Bird Treaty Act[71] prohibits killing, possessing or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds and bird nests and eggs. Birds of prey are protected in California under the state Fish and Game Code, Section 3503.5, 1922. The Code states that it is "unlawful to take, possess or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess or destroy the nest or eggs of any such bird except as otherwise provided by the code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFG. Any loss of fertile eggs, nesting raptors, or any activities resulting in nest abandonment would constitute a significant impact. This would apply to Red-tailed Hawks, American Kestrel and other birds of prey.

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70 Thomas Coe, U.S. Army Corps of Engineers, personal communication.
71 16 U.S.C., Sec. 703, Supp. I, 1989.

Table 29

Special-Status Plant and Animal Species

COMMON NAME	SCIENTIFIC NAME	STATUS	POTENTIAL FOR OCCURRENCE ON SITE
ANIMALS			
State or Federally Endangered or Threatened Species			
Longhorn Fairy Shrimp	*Branchineacta longiantenna*	FE	No suitable habitat on site, presumed absent.
Vernal Pool Fairy Shrimp	*Branchinecta lynchi*	FT	No suitable habitat on site, presumed absent.
Vernal Pool Tadpole Shrimp	*Lepidurus packardi*	FE	No suitable habitat on site, presumed absent.
Alameda Striped Whipsnake	*Masticophis lateralis euryxanthus*	ST, FC2	No suitable habitat on site, presumed absent.
Swainson's Hawk	*Buteo swainsoni*	ST	Possible transient.
American Peregrine Falcon	*Falco peregrinus anatum*	FE, SE, ST	Potential foraging habitat; no breeding habitat
San Joaquin Kit Fox	*Vulpes macrotis mutica*	FE, ST	No denning habitat; no records from site or vicinity, unlikely.
California Species of Special Concern, State Protected, or Federal Candidate Species			
Curve-footed Diving Beetle	*Hygrotus curvipes*	FC2	Marginal habitat only; unlikely
Ricksecker's Scavenger Beetle	*Hydrochara ricksecker*	FC2	No suitable habitat on site; presumed absent.
Molestan Blister Beetle	*Lytta molesta*	FC2	Marginal habitat only; unlikely
California Tiger Salamander	*Ambystoma californiense*	FC1, S	Suitable breeding habitat on site; possible.
Western Spadefoot	*Scaphiopus hammondii*	FC2, S	No records from vicinity; presumed absent.
California Red-legged Frog	*Rana aurora draytoni*	FC1, SP, S	No suitable habitat on site.
Western Pond Turtle	*Clemmys marmorata*	FC2, S	Suitable habitat on site; possible.
California Horned Lizard	*Phrynosoma coronatum frontale*	S	No suitable habitat on site; presumed absent.
White-tailed Kite	*Elanus caeruleus*	SP	Pair observed in courtship display; potential breeder on site.
Northern Harrier	*Circus cyaneus*	S	No suitable breeding habitat; observed foraging on site.

Continued on next page

FE = Designated as an endangered species by the federal government.
SE = Designated as an endangered species by the California Fish and Game Commission.
ST = Designated as a threatened species by the California Fish and Game Commission.
FC1 = Designated as a candidate species by the federal government. Occurrence on list 1 indicates that U.S. Fish and Wildlife Service has sufficient biological information to support a proposal to list the species as Endangered or Threatened.
FC2 = Designated as a candidate species by the federal government. Occurrence on list 2 indicates that U.S. Fish and Wildlife Service has potential information for upgrading listing to endangered or threatened, but conclusive data on the biological vulnerability and threat are not currently available to support proposed listing.
FC3b = Species considered for proposed listing, but rejected.
S = Species of Special Concern, including species whose breeding populations in the state have declined severely or are otherwise so low that local extinction is a real possibility. There are no special legal statutes governing the protection of this group.
SP = Fully protected species in the state of California.
CNPS 1A = Plants presumed extinct in California.
CNPS 1B = Plants rare, threatened, or endangered in California, and elsewhere.
CNPS 2 = Plants rare, threatened, or endangered in California, but more common elsewhere.
CNPS 3 = Plants about which we need more information; a review list.

Table 29
(Continued)

Special-Status Plant and Animal Species

COMMON NAME	SCIENTIFIC NAME	STATUS	POTENTIAL FOR OCCURRENCE ON SITE
California Species of Special Concern, State Protected, or Federal Candidate Species (Continued)			
Sharp-shinned Hawk	*Accipiter striatus*	S	Transient and winter visitor on site.
Cooper's Hawk	*Accipiter cooperii*	S	No suitable breeding habitat; potential forager.
Ferruginous Hawk	*Buteo regalis*	FC2	No suitable breeding habitat; potential winter visitor.
Golden Eagle	*Aquila chrysaetos*	SP, S	No suitable breeding habitat; rare to occasional forager.
Merlin	*Falco columbarius*	S	Unlikely to rare winter visitor.
Prairie Falcon	*Falco mexicanus*	S	No suitable breeding habitat; rare to occasional forager.
Burrowing Owl	*Speotyto cunicularia*	S	No suitable habitat on site; potential migrant and forager.
California Yellow Warbler	*Dendroica petechia brewsteri*	S	No suitable breeding habitat on site; potential migrant and transient.
California Horned Lark	*Eremophila alpestris actia*	FC2	Suitable breeding habitat present; likely forager.
Loggerhead Shrike	*Lanius ludovicianus*	FC2	No suitable breeding habitat; marginal foraging habitat.
Salt-marsh Common Yellowthroat	*Geothlypis trichas sinuosa*	FC2, S	No records from Contra Costa Co.; no suitable habitat onsite; unlikely.
Tricolored Blackbird	*Agelaius tricolor*	FC2, S	Potential breeding habitat on site
Townsend's Big-eared Bat	*Plecotus townsendii*	FC2, S	Potential foraging habitat on site
Pallid Bat	*Antrozous pallidus*	S	Potential foraging habitat on site
San Joaquin Pocket Mouse	*Perognathus inornatus inornatus*	FC3b	Suitable habitat; potentially present.
American Badger	*Taxidea taxus*	S	No suitable habitat on site; presumed absent.

FE = Designated as an endangered species by the federal government.
SE = Designated as an endangered species by the California Fish and Game Commission.
ST = Designated as a threatened species by the California Fish and Game Commission.
FC1 = Designated as a candidate species by the federal government. Occurrence on list 1 indicates that U.S. Fish and Wildlife Service has sufficient biological information to support a proposal to list the species as Endangered or Threatened.
FC2 = Designated as a candidate species by the federal government. Occurrence on list 2 indicates that U.S. Fish and Wildlife Service has potential information for upgrading listing to endangered or threatened, but conclusive data on the biological vulnerability and threat are not currently available to support proposed listing.
FC3b = Species considered for proposed listing, but rejected.
S = Species of Special Concern, including species whose breeding populations in the state have declined severely or are otherwise so low that local extinction is a real possibility. There are no special legal statutes governing the protection of this group.
SP = Fully protected species in the state of California.
CNPS 1A = Plants presumed extinct in California.
CNPS 1B = Plants rare, threatened, or endangered in California, and elsewhere.
CNPS 2 = Plants rare, threatened, or endangered in California, but more common elsewhere.
CNPS 3 = Plants about which we need more information; a review list.

Table 29
(Continued)

Special-Status Plant and Animal Species

COMMON NAME	SCIENTIFIC NAME	STATUS	POTENTIAL FOR OCCURANCE ON SITE
PLANTS			
California Species of Special Concern, State Protected, or Federal Candidate Species			
Diamond-petaled California Poppy	*Eschscholzia rhombipetala*	FC2, 1B	Marginal habitat present, unlikely.
Showy madia	*Madia radiata*	1B	Marginal habitat present, unlikely.
Fragrant fritillary	*Fritillaria liliacea*	FC2, 1B	Habitat not appropriate, presumed absent.
Stinkbells	*Fritillaria agrestis*	FC3c, 4	Marginal habitat present, unlikely.
Caper-fruited tropidocarpum	*Tropidocarpum capparideum*	FC2, 1A	Marginal habitat present, unlikely.

FE = Designated as an endangered species by the federal government.
SE = Designated as an endangered species by the California Fish and Game Commission.
ST = Designated as a threatened species by the California Fish and Game Commission.
FC1 = Designated as a candidate species by the federal government. Occurrence on list 1 indicates that U.S. Fish and Wildlife Service has sufficient biological information to support a proposal to list the species as Endangered or Threatened.
FC2 = Designated as a candidate species by the federal government. Occurrence on list 2 indicates that U.S. Fish and Wildlife Service has potential information for upgrading listing to endangered or threatened, but conclusive data on the biological vulnerability and threat are not currently available to support proposed listing.
FC3b = Species considered for proposed listing, but rejected.
S = Species of Special Concern, including species whose breeding populations in the state have declined severely or are otherwise so low that local extinction is a real possibility. There are no special legal statutes governing the protection of this group.
SP = Fully protected species in the state of California.
CNPS 1A = Plants presumed extinct in California.
CNPS 1B = Plants rare, threatened, or endangered in California, and elsewhere.
CNPS 2 = Plants rare, threatened, or endangered in California, but more common elsewhere.
CNPS 3 = Plants about which we need more information; a review list.
CNPS 4 = Plants of limited distribution; a watch list.

Information concerning threatened, endangered or other special-status species that may occur in the area was collected from several sources.[72]

A search for published accounts of these species in the CNDDB was conducted for the Antioch South Quad (U.S. Geological Survey topographical Quadrangle Map) in which the project site is located and the eight surrounding quads.[73] In addition to the special-status species identified by the CNDDB search, all species listed as occurring in Alameda County in the CNPS *Inventory of Rare and Endangered Vascular Plants of California* and occurring on CNPS Lists 1A, 1B, 2 or 4 were reviewed.

Table 29 (above) summarizes the listing status of special-status plant and animal species that occur in the project vicinity in habitats similar to those on the project site. Also listed is the potential of occurrence onsite for each species. Expanded descriptions of those species for which potentially suitable breeding habitat occurs on the project site or for which surveys were or are being conducted are included in Appendix E.

(3) Protected Trees. The City of Antioch has adopted a Tree Ordinance with the purpose of protecting certain categories of trees on public and private property within the City of Antioch. This Tree Ordinance requires that a permit be obtained from the Department of Parks or approval be obtained as a part of the regular development application process. Guidelines for planting replacement trees are also provided. Categories of trees subject to protection include the following:

- ***Established Tree***. Any tree which is at least 10 inches in diameter, as measured 4.5 feet above natural or finished grade.
- ***Mature Tree***. Any tree which is at least 26 inches in diameter, as measured 4.5 feet above natural or finished grade.
- ***Landmark Tree***. Any tree of at least 48 inches in diameter and/or in excess of 40 feet in height.
- ***Indigenous Tree***. A naturally growing tree of the following species: blue oak (*Quercus douglasii*); valley oak (*Quercus lobata*); coast live oak (*Quercus agrifolia*); canyon live oak (*Quercus chrysolepis*); interior live oak (*Quercus wislizenii*); California buckeye (*Aesculus californicus*); California bay (*Umbellularia californica*).
- ***Street Tree***. Any tree planted within the public right-of-way and/or tree planting easement.

A tree survey was not conducted as a part of this study. Some orchard and ornamental trees observed within the planning area may meet the definition of "established trees". If so, their removal may be subject to provisions of the City tree ordinance. Mature trees, landmark trees, indigenous trees and street trees appear to be absent from the study area.

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72 These sources included the California Department of Fish and Game's Natural Diversity Data Base (CNDDB 1994), California Wildlife Habitat Relationships species notes (CDFG 1988, 1990a, 1990b) and miscellaneous information available through the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG) and technical publications. The California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plants of California*, the CNPS East Bay Chapter's *Status of Rare, Threatened and Endangered Vascular Plants in Alameda and Contra Costa Counties* (third edition draft, 1994) and *The Jepson Manual* supplied information regarding the distribution of vascular plants in the vicinity. Several local experts including Glen Coppe, Brad Olsen and Dianne Lake of the East Bay Chapter of CNPS; Jake Rugit of the Sonoma County Chapter of CNPS, Steve Edwards of the East Bay Regional Parks Botanical Garden at Tilden Park, Roxanne Bittman of the CDFG Endangered Plant Project and Dr. Bruce Pavlik of Mills College also provided information regarding local special-status plant species.

73 Includes Antioch North, Brentwood, Byron Hot Springs, Clayton, Honker Bay, Tassajara, Jersey Island and Diablo.

III.J.2 Impacts

a. Significance Criteria. When considering biological resources, CEQA has defined "significant effect on the environment" as "a substantial adverse change in the physical conditions which exist in the area affected by the proposed project". According to Appendix G of *CEQA, Statute and Guidelines*, a project's effects on biotic resources will be considered significant when the project will: (a) substantially affect a rare or endangered species of animal or plant or the habitat of the species; (b) interfere substantially with the movement of any resident or migratory fish and wildlife species; (c) substantially diminish habitat for wildlife or plants.

b. Effects Found to be Less Than Significant. The biological resources listed below are either unprotected by local, state or federal laws, or are considered sufficiently abundant throughout eastern Contra Costa County that impacts in the study area, whatever their magnitude, would not be considered substantial.

(1) Loss of Non-native Grassland. The specific plan provides for the development of approximately 300 acres of non-native grassland in the low hills west of East Antioch Creek. This development will eliminate approximately 65 percent of the non-native grassland in the study area. Approximately 162 acres of non-native grassland will remain as open space along ridgetops.

The diversity of native plants once associated with this grassland has been substantially reduced by periodic mowing and grazing. No special status plants are expected to occur within this habitat. Therefore, conversion of non-native grassland to the land uses proposed in the specific plan would not have a significant effect on native botanical resources.

Although the grasslands of the specific plan area provide habitat for a variety of small birds and mammals, their value to native animals has been reduced by current and historic land use practices and development on surrounding lands. Periodic mowing and grazing have reduced available cover required by many small animals. Furthermore, the study area has been somewhat isolated from large areas of grasslands in other parts of Contra Costa County, thus reducing the accessibility of the site to terrestrial animals dispersing from other undeveloped lands. Site development would reduce the available foraging habitat for various raptors, but large areas of such habitat to the south and west of the specific plan area are protected from future development by the 65/35 Land Preservation Standard in the Contra Costa County General Plan. Therefore, development within the grassland habitats of the planning area is not expected to have a significant effect on native wildlife resources.

(2) Loss of Orchards or Croplands. Implementation of the proposed plan would eliminate approximately 317 acres of orchard and cropland. These lands provide little or no habitat for native plants. Orchards provide habitat for a variety of birds and small mammals. Croplands provide limited habitat for small mammals and foraging birds. Both orchards and croplands will continue to be regionally abundant after development of the planning area. Special status animals, with the possible exception of the White-tailed Kite, are absent from orchards and fields of the specific plan area. Possible impacts to the White-tailed Kite are discussed below under "*Effects Found to Be Potentially Significant*". Otherwise, the loss of orchards and croplands will not have a significant effect on native botanical or wildlife resources.

(3) Loss of Plant and Animal Species of Special Status. Several plant and animal species of special status are known to occur regionally, but are not expected to occur within the planning area. Table 29 lists 5 plant and 13 animal species which are unlikely to occur in habitats of the planning area. For example, the seasonal wetland habitat required for three species of freshwater shrimp is absent from the planning area.

Therefore, the shrimp are presumed absent. These special status species will therefore not be affected by the development associated with the proposed plan.

An additional 13 special status animals may forage on the site from time to time. For example, several species of raptors and two species of bats could occasionally occur within the planning area. The planning area, however, does not provide these species breeding habitat or critically important foraging habitat. Even after development of the planning area, large tracts of suitable foraging habitats will remain for these species to the south and west. These areas are protected from future development by the 65/35 Land Preservation Standard in the Contra Costa County General Plan. Therefore, development of the planning area will not have a significant effect on these species.

The site provides some breeding habitat for three special status species of birds. Development of the planning area will have a less than significant effect on two of these species. Marginal breeding habitat for the Tri-colored Blackbird was present in East Antioch Creek. This artificial flood control channel is to be relocated and enlarged. Maintenance activities within this channel include the periodic removal of vegetation which could be used by Tri-colored Blackbirds. These activities will continue regardless of the land use plan eventually adopted for the planning area. Therefore, adoption of the specific plan will have no effect on potential breeding habitat for this species. Large areas of suitable habitat in eastern Contra Costa County will remain protected from future development by the 65/35 Land Preservation Standard. Possible impacts to White-tailed Kites are discussed in subpart c, below.

Western pond turtles and California tiger salamanders potentially occur in the freshwater marsh at the north end of the planning area on lands of the Contra Costa Water District. Because this freshwater marsh is within the proposed alignment of the Delta Expressway, the only potential habitat for these species within the planning area will be eliminated by highway construction. The loss of the freshwater marsh and associated impacts to reptiles and amphibians using it, while significant, cannot be attributed to the proposed specific plan.

(4) Loss of Ordinance Size Trees. Although no tree survey has been conducted in the planning area, it is apparent that trees meeting the definition of an "ordinance size tree" are largely absent. Most trees of the study area are orchard trees with relatively small dimensions. Some horticultural trees growing within landscaped yards of individual residences may meet the definition of "established trees". If so, the loss of these trees would be subject to the provisions of the City of Antioch tree ordinance. The loss of these trees, however, would not represent a significant impact to biological resources.

(5) Interference with the Movement of Resident and Migratory Fish and Wildlife Species. Development will interfere with the home range and dispersal movements of terrestrial vertebrates now resident in the planning area. As discussed above on subparts b(1) and b(2), foraging activities of some species within the planning area will be eliminated. However, dispersal to and from the site has already been affected by surrounding development and these effects are not considered significant impacts. Furthermore, no portion of the planning area serves as a movement corridor for migratory animals and development there will have no effect on the movements of migratory species passing through eastern Contra Costa County.

c. Effects Found to Be Potentially Significant. The biological resources listed below are limited in regional distribution, provide special habitat values, or are protected by state and federal law such that impacts to them are considered significant. Impacts to special status animals are considered significant according to guidance found in *CEQA, Statutes and Guidelines.*

(1) [Impact J1] *Wetland habitats within the planning area would be lost or periodically modified by development envisioned by the proposed plan.*

The freshwater marsh located on lands of the Contra Costa Water District is located within the alignment of the proposed Delta Expressway. Road construction will eliminate approximately 4.0 acres of marsh. This impact, however, cannot be attributed to the proposed specific plan.

Portions of East Antioch Creek will be enlarged and relocated. This artificial channel is periodically cleared of vegetation to maintain maximum capacity for flows of stormwater runoff. Construction and maintenance activities in East Antioch Creek are not directly attributable to the Specific Plan.

The proposed plan shows residential development within the seasonal wetland located in the southwest corner of the planning area. It is expected that approximately 1.7 acres of seasonal wetland will be eliminated by proposed residential development and associated infrastructure. Wetland habitats in California have been substantially diminished in number and areal extent by urban growth and agricultural activities. Loss of this wetland would be a significant adverse environmental impact.

Development of the project would eliminate approximately 1.7 acres of seasonal wetland habitat, creating a significant impact. Other potential impacts to wetland habitat resulting from development of the Delta Expressway and modifications made to Antioch Creek do not constitute direct impacts attributable to the Specific Plan.

(2) [Impact J2] *Water quality in East Antioch Creek would be degraded.*

Stormwater runoff generated from parking lots, streets, landscaping, etc. often contains silt, grease, oil, pesticides, herbicides and trace amounts of heavy metals. These pollutants may find their way into East Antioch Creek. Other chemical pollutants which could be flushed through the storm drain system into East Antioch Creek may be generated by industrial facilities. Although periodically maintained to convey stormwater runoff from the planning area and adjoining lands, East Antioch Creek provides some habitat for aquatic organisms. The decline of water quality in East Antioch Creek could reduce the number and diversity of aquatic invertebrate and vertebrate species in the creek itself, and in downstream creeks and wetlands to which it is tributary. In turn, the number of terrestrial vertebrates that prey on aquatic organisms would be expected to decline. Any discharge of polluted runoff into East Antioch Creek not meeting established state water quality standards would be considered a significant adverse environmental effect.

Polluted runoff resulting from development of the project could create a significant impact by reducing the number and diversity of aquatic invertebrate and vertebrate species living in East Antioch Creek and other connected wetland habitats. Degraded water quality may also threaten some terrestrial vertebrate species which feed on aquatic life.

(3) **[Impact J3]** ***Active raptor nests could be disturbed.***

Active raptor nests are protected by state and federal law. White-tailed Kites may breed in the planning area. Construction activities conducted during the breeding season which disturb nesting raptors, or destroy active nests, would be considered a significant adverse environmental impact.

> Construction of the project during breeding season may be considered a significant impact if construction activities disturb nesting raptors (including the White Tailed Kite) or destroy active nests.

III.J.3 Mitigation Measures

Under CEQA, mitigation measures to vegetation and wildlife focus upon: (1) avoiding the impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (3) rectifying the impact by repairing, rehabilitating, or restoring the impacted environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and/or (5) compensating for the impact by replacing or providing substitute resources or environments. The following mitigation measures are recommended to address significant impacts to vegetation and wildlife.

Impact J1

Development allowed by the proposed plan would affect wetland habitat located in the southwest corner of the planning area. Further study will be required to determine the exact boundaries of this wetland due to the existence of offsite drainage facilities of an interim nature.

Mitigation Measure J1

The developer of any subsequent project(s) shall be required to have a formal wetland delineation undertaken and verified by the Army Corps of Engineers. Based on the findings of that delineation, the developer may be required to have a wetland replacement plan prepared by a biologist qualified to prepare such plans, and shall commit to its implementation in a manner, and on a schedule, acceptable to the Corps and to the City of Antioch.

Impact J2

Water quality in East Antioch Creek would be degraded.

Mitigation Measure J2

A site management plan shall be developed to prevent water quality degradation. An acceptable site management plan would include the following elements:

- Baseline studies conducted prior to construction which establish existing water quality in East Antioch Creek during winter flows;
- Best management practices consistent with existing National Pollution Discharge Elimination System (NPDES) permits regulating non-point source pollution;
- Quarterly monitoring of water quality in East Antioch Creek to ensure that state water quality standards are met; and

- Remedial measures which would be implemented should water quality in East Antioch Creek diminish below state water quality standards

Impact J3 Active raptor nests could be disturbed.

Mitigation Measure J3 Construction activities during the nesting season (February through July) could disturb nesting raptors and should be preceded by surveys conducted by a qualified ornithologist. If nesting raptors are located in proposed construction areas such that nesting success will be doubtful, then construction should be postponed until the nesting season is over.

Implementation of the mitigation measures listed above would reduce the identified impacts on biotic resources to less-than-significant levels.

III.K CULTURAL RESOURCES[74]

III.K.1 Setting

a. Introduction. This report was prepared pursuant to the requirements the California Environmental Quality Act (CEQA) Supplementary Document J. The Secretary of the Interior's Standards and Guidelines for Archeology (36 CFR 61) were followed throughout the work.

b. Methodology. The focus of the work was to identify historic or prehistoric cultural resources within the project area. The work comprised two components: (1) a thorough review of state records and literature to identify known cultural resources (i.e. historic, prehistoric and architectural sites or objects) and previous cultural resource surveys within the project area; and (2) a field survey to determine whether any previously undiscovered historic properties exist within the area, and to examine any known properties in the area found during the record search. The subsequent evaluation phase involved assessment of any known or discovered historic properties in the project area in accordance with the criteria for importance as contained in CEQA Supplementary Document J.

c. Results of Record Search. A record search was conducted on September 21, 1993 at the California Archeological Inventory, Northwest Information Center at Sonoma State University. The search indicated that there were no known prehistoric sites and no National Register of Historic Places (listed) properties within the project area. No historic sites over 100 years in age were previously recorded within FUA #2.

d. Previous Cultural Resource Surveys. Three cultural resource surveys have been conducted partially within FUA #2, and six additional surveys are known to have been undertaken within one mile of the FUA #2 project area. These led to the recording of two sites in the general area of FUA #2, one prehistoric and one historic. The historic site, CA-CCo-532H, consists of an historic farm complex and is located approximately ½ mile north of the Sand Creek specific planning area and one mile west of FUA #2 adjacent to Lone Tree Way. The prehistoric site, CA-CCo-572, consists of a small lithic scatter and is also located along Lone Tree Way, roughly ¼ mile west of FUA #2.

e. Literature Search Results. Additional information on the project area was gathered from a variety of sources. The Contra Costa County Historical Society, with the help of Ms. Betty Maffei, provided background information including an 1873 map of the survey area, and many newspaper articles about the mines. The East Bay Regional Parks Black Diamond Mine District provided access to detailed information housed at park headquarters. These included 1890s voter registration lists for the towns of West Hartley, Empire, Judsonville and Star Mine in addition to numerous newspaper articles of that period. The earliest maps of the project area, dating to 1896 and 1911, were copied at the United States Geographic Survey in Menlo Park and carefully reviewed for historical information. Additional maps of the area, dating to later time periods, were collected at the Doe Library Map Room of the University of California, Berkeley. Structures that are depicted on these maps as being located within FUA #2 were examined during the ground survey for historic debris and structural foundations.

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74 A technical background report on the subject of *Cultural Resources* has been prepared by William Self & Associates. The full report is excerpted here in Chapter III and available for review at the City of Antoch, Planning Department..

III.K.2 Impacts

a. Significance Criteria. CEQA Supplementary Document J, Section III states that an "important archeological resource" is one which:

(1) is associated with an event or person of (a) recognized importance in California or American history, or (b) recognized scientific importance in prehistory;

(2) can provide information which is both of demonstrable public interest and useful in addressing scientifically consequential and reasonable or archeological research questions;

(3) has special or particular quality such as oldest, best example, largest, or last surviving example of its kind;

(4) is at least 100 years old and possesses substantial stratigraphic integrity; or

(5) involves important research questions that historical research has shown can be answered only with archeological methods.

To evaluate cultural resource sites against CEQA criteria requires consideration, among other things, of the overall integrity of the site, the regional cultural history (the types, ages, and distribution of other sites in the region), and the nature of questions that researchers are attempting to address regarding the history or prehistory of the region.

The evaluation of cultural resource sites assesses the potential of each site to meet one or more of the criteria for significance is based upon visual surface and subsurface evidence at each site location, information gathered during the literature and record searches, and the researcher's knowledge of, and familiarity with, the historic or prehistoric context associated with each site.

b. Effects Found to be Less than Significant. None identified.

c. Effects Found to be Potentially Significant. While the impacts described below do not qualify as significant under CEQA, the presence of additional (as yet undiscovered) subsurface resources cannot be discounted. Therefore, mitigation measures relating to construction period impacts are listed at the end of this section.

[Impact K1] ***Subsurface archaeological resources (as yet undiscovered), including human remains, could be present at the project site.***

Two additional cultural resource sites were discovered and recorded during the survey of FUA #2 (CA-CCo-691H and 692H). The first site (CA-CCo-691H) is the location of a collapsed historic building consisting of a foundation wall cut into a hillside, a pile of boards which exhibits the use of square-headed wrought nails, and a windmill, the latter of which is probably not over 100 years old. The second site (CA-CCo-692H) is the former location of the Lone Tree School; it first appears on the 1911 USGS topographic map of the area (thus pre-dating that time) and continues to appear through 1968 map editions. While both of the sites were historic in nature, both were found to fall short of the CEQA definition of significance.

Site CA-CCo-691H cannot provide information which is of public interest and useful in addressing scientifically consequential and reasonable or archeological research questions; it does not appear to be at least 100 years old; and it does not appear to contain data which could address important research questions that could

be answered only with archeological methods. However, the presence of earlier, subsurface resources cannot be discounted and, therefore, the mitigation measures outlined below require that the initial phases of ground disturbance at the site (if any) should be subject to archeological monitoring.

Site CA-CCo-692H appears to lack integrity due to disturbance that has occurred since the time it was originally occupied (ca. 1910). A lack of surficial artifacts, or evidence of features, suggests that no archeological aspect of the site remains intact. In addition, the site does not appear to meet the 100-year requirement of CEQA, and there is no evidence that the site was utilized prior to 1900.

In light of this analysis, additional cultural resource investigations within FUA #2 are not warranted as part of the specific plan process. However, provision should be made for the possibility of discoveries of cultural resources (including human remains) during the construction of individual development projects allowed under the proposed plan.

With the potential exception of subsurface resources within site CA-CCo-691H and human remains at any location within the planning area, development allowed under the proposed specific plan is not expected to create significant adverse impacts on cultural resources.

III.K.3 Mitigation Measures

Impact K1 Subsurface archaeological resources, including human remains, could be present at the project site.

Mitigation Measure K1a Initial ground-disturbing construction activities within the site boundaries shall be monitored by a qualified archeologist.

A qualified archeological monitor shall be present during excavation and grading at site CA-CCo-691H. The monitor shall be capable of recognizing and assessing potential historic archeological resources should they be discovered during excavation or grading. Onsite monitoring should include the following:

- ☐ In the event a potentially significant resource is uncovered during ground-disturbing activities, the machine operator should cease work until such time that the resource can be evaluated.
- ☐ In the event the resource is found to be significant (or a feature is encountered), mechanical excavation in the area should cease temporarily until formal site recording or data recovery, and compliance with the provisions of CEQA Supplemental Document J, is performed under the supervision of an archeologist meeting the criteria of applicable federal regulations.
- ☐ All archeological materials recovered shall be analyzed and reported upon in a manner consistent with state requirements and current professional standards.
- ☐ Significant historical artifacts recovered during mitigation should be curated in a professional facility meeting current state and federal standards for curation.

Mitigation Measure K1b Section 7050.5(b) of the California Health and Safety Code should be implemented in the event that human remains, or possible human remains, are located. It states:

> In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with Section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of Section 27492 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner and cause of death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code.

The County Coroner, upon recognizing the remains as being of Native American origin, is responsible to contact the Native American Heritage Commission within 24 hours. The Commission has various powers and duties to provide for the ultimate disposition of any Native American remains, as does the assigned Most Likely Descendant. Sections 5097.98 and 5097.99 of the Public Resources Code also call for "protection to Native American human burials and skeletal remains from vandalism and inadvertent destruction". To achieve this goal, it is recommended the construction personnel on the project be instructed as to the potential for discovery of cultural or human remains, and both the need for proper and timely reporting of such finds, and the consequences of failure thereof.

Implementation of the above mitigation measures would insure that potential impacts to cultural resources remain at less-than-significant levels.

III.L VISUAL RESOURCES

III.L.1 Setting

a. Natural Elements of the Visual Environment. FUA #2 lies at the extreme easterly edge of the Mount Diablo complex, an element of the Coast Range. The natural elements that shape the visual character of the site are topography, drainage and vegetation.

Toward the east lies the flat expanse of the San Joaquin-Sacramento River Delta. The ridge that bisects the planning area north to south is part of that topographical complex. East of the ridge, the land blends into the basically flat area to the east; west of the ridge, the topography is one of gently rolling hills through Antioch's Southeast Area. The highest point on the site is at the north end of the ridge. All along the ridge top there are views in various directions, principally to the north from the northern hilltop, to the east from the length of the main ridge form (separated from the northern hill by a natural "gateway" which is traversed by Laurel Avenue), and toward Mt. Diablo and the south from the southern slopes of the ridge. This potential for views is probably the planning area's chief visual asset.

The planning area is traversed by East Antioch Creek, an important visual feature. The creek flows from west to east in the southern part of the site, parallel to Lone Tree Way, then bending north (see the aerial photograph of the area, Figure 5, p. 18), separating the main body of the ridge described above from the isolated knoll in the southeast. As described elsewhere in this report, at present the creek serves exclusively drainage purposes; it has not been improved for recreational use or to serve as an attractive amenity.

Vegetation on the site is primarily grassland and low-lying shrubs, consistent with the most recent use of the land (grazing). Some non-native trees remain in the area accessible from Empire Avenue that are the surviving remnants of orchard production in years past.

b. Constructed Elements of the Visual Setting. There are three main types of constructed elements in the visual environment of FUA #2: infrastructure installations, transportation facilities and a small number of buildings.

The most visible constructed element of the setting is the water tank owned by the Diablo Water District, which is located on the northernmost ridgetop site, and which is visible from many vantage points throughout the general area. The Contra Costa Canal forms the northern boundary of the planning area. Along the west, an overhead utility line, and the clear path beneath the lines, establish a physical separation between the FUA and lands to the west.

A second constructed element consists of the roads and the railroad tracks. The Southern Pacific Railroad tracks, with Neroly Road beyond, creates the diagonal northeast boundary of the site. Empire Avenue aligns the rest of the eastern boundary, and Lone Tree Way establishes the southern boundary.

A final constructed element consists of scattered houses and outbuildings located primarily in the southeastern corner of the site.

None of the constructed elements of the environment constitute significant visual resources.

III.L.2 Impacts

a. Visual Characteristics of the Specific Plan. Development of the site as proposed by the Specific Plan would modify (generally, emphasize) certain elements of the visual environment that already exist, and add to that environment the development of two basically different types in the two basically different zones of the site.

Linear elements that would be retained and emphasized are the transportation and drainage corridors. Existing transportation routes would continue to be present (railroad tracks, Neroly Road, Empire Avenue, Laurel Avenue); Sunset would be constructed to form another north-south route in the eastern part of the site. The most dramatic change would be the construction of the SR 4 Bypass, which would occupy a north-south corridor in virtually the center of the FUA.

Giving further emphasis to this north-south axis, East Antioch Creek would be re-aligned along the route of the Bypass, and the Las Vaqueros Pipeline would be constructed in that same corridor. The effects of these changes – some of which have been planned outside the planning process reflected in this EIR – would be to emphasize further the distinction between the eastern portion of the FUA and the western, a distinction that their different topographical characteristics already clearly establish.

Added to the visual environment would be buildings constructed of essentially two different types: residential, primarily in the form of single-family homes west of the ridge, and non-residential, primarily in relatively large floor plate buildings (a) east of the ridge and (b) in the area between the channel of East Antioch Creek and Lone Tree Way in the southern portion of the planning area.

The Specific Plan also calls for provision of certain open space and recreational amenities that would enhance the visual quality of the site as it develops. These include (a) a ridgetop trail, affording views in various directions as noted above, (b) improvement of the channel of East Antioch Creek for aesthetic and, potentially, recreational purposes, (c) design of the bridge over East Antioch Creek as a major visual amenity, and (d) support for expansion of the Lindsey Detention Basin (Contra Costa Water District) for increased flood control and recreational purposes. These elements of the Specific Plan would contribute to an improved visual framework for the urban development that is also proposed by the Specific Plan.

b. Significance Criteria. Evaluation of aesthetic/visual impacts is guided by CEQA Guidelines (this subsection) and public agency plans and policies (subsection c, below).

CEQA Guidelines (Appendix B) state that an adverse environmental impact occurs if a project will "have a substantial, demonstrable negative aesthetic effect". The Environmental Checklist Form (Guidelines, Appendix I) specifies the issue as whether the proposal would result in "the creation of an aesthetically offensive site open to public view" or "the obstruction of any scenic vista or view open to the public".

These standards are narrow: few projects that are otherwise acceptable to most communities will be demonstrably negative in aesthetic effect, or create an aesthetically offensive site open to public view. However, the criteria are helpful, as project consideration goes forward, in providing a structure for considering the detailed design and operation of a particular project in order to avoid otherwise unforeseen and undesirable visual impacts.

The final standard cited in the Guidelines has to do with obstructing scenic vistas. No detailed perspective studies have been undertaken of the proposed site plan but, given site location and topography, it is unlikely that views from any presently-existing building or open public space would be adversely affected by the project: the combination of the building dimensions and the distance from existing development make it unlikely that obstruction (if any) would be significant.

c. Antioch Requirements. Antioch's General Plan sets forth overall goals for community design that are "intended as a policy framework guiding the City's Design Review process..." (p. 41).

One of the important policies of the General Plan (p. 14) affecting FUA #2 is that on hillside areas. Hillside areas are to be reserved for low residential density to retain the natural environmental features; hilly slopes are seen as contributing to the unique identity of residential neighborhoods. To the greatest extent possible, building and pad elevations should reflect the natural contour of the hillside through the use of reduced street sections, split building pads and limitations on the size of flat pad area.

A second set of City policies affecting the planning area relates to East Antioch Creek, which would be subject to Antioch's Creek Policy. That policy (General Plan, p. 51; Creek Development Policy, p. 10) calls for the revegetation of creek banks, a program that has been incorporated into the Specific Plan.

Finally, Antioch policy addresses the visual appearance of future construction, especially of residential construction, in the neighborhoods of the urbanizing parts of the city. The present predominance of low-density residential development in the city is to be preserved and maintained in future urbanizing areas (General Plan, p. 13). Appropriate design features are encouraged for residential developments to establish identity and a sense of community (Housing Element, p. 74), and each neighborhood is intended to have its particular design features (landscaping, entry ways, wall treatments, architecture) in order to distinguish one neighborhood from another and to give residents a greater "sense of place" (Housing Element, p. 75).

The General Plan calls for continued implementation of Antioch's Design Review Guidelines, which address site and building design (including guidelines specific to residential, commercial and industrial use areas), landscaping, signage and other visual features (such as fencing). Implementation of design review is accomplished by an appointed Design Review Board, supported by staff of the Development Services Department, based on the Final Development Plan submitted for a project.

d. Visual Impact Evaluation. Impacts of the proposed Specific Plan on visual resources should be considered in the light of the previous discussion, which defines the ridge as the most outstanding visual feature of the planning area, and which does not identify other natural or constructed features that call for protection as visual resources.

e. Effects Found to be Less than Significant. None identified.

f. Effects Found to be Potentially Significant. Two effects of the Specific Plan would be potentially significant.

(1) **[Impact L1]** ***Potential adverse impact on important visual resources of the site.***

The Specific Plan, if not responsive to City policies with regard to the protection of important visual resources, could reduce the value of those resources and fail to take advantage of the aesthetic and amenity value that they can contribute to urban development.

Development of the Specific Plan could reduce the value of visual resources and minimize the potential use of visual resources as aesthetic amenities.

(2) **[Impact L2]** ***Potential for elements of Specific Plan development to create adverse visual impacts or demonstrably negative aesthetic effects.***

Sound walls, resulting from construction of the SR 4 bypass, would result in adverse visual impacts that are not directly associated with the Specific plan itself. The provision of such barriers may be subject to City review and mitigation at the time the highway is designed and constructed. There is a remote possibility, however, that other elements of future development might result in adverse visual effects. The elements proposed – residences, non-residential buildings, collector streets, a new park, improvement of East Antioch Creek and the Lindsey Detention Basin – are not of themselves unattractive, but it is possible that siting particular activities and facilities (such as storage or utility areas) might result in unattractive views from on- or offsite locations.

Direct and indirect elements of the Specific Plan would result in potentially adverse visual impacts.

III.L.3 Mitigation Measures

Impact L1 Potential adverse impact on important visual resources of the site.

Mitigation Measure L1 Site planning and grading plans shall respect the integrity of the ridge that is an important visual resource of the planning area.

The Draft Specific Plan has been particularly attentive to the retention of the ridge as an important aesthetic feature within FUA #2. The Specific Plan recognizes that some residential sites would abut the ridgetop open space, and seeks means to assure that these edges be given a natural appearance. The Specific Plan sets forth guidelines (grading specifications and illustrations) to provide guide site and grading plan review to assure that the intention of the Specific Plan – to maintain the visual quality and integrity of the ridge – will be achieved. The Specific Plan also calls for the improvement of the channel of East Antioch Creek as an amenity to future development.

Impact L2 Potential for elements of Specific Plan development to create adverse visual impacts or demonstrably negative aesthetic effects.

Mitigation Measure L2a Utilize site plan review and design review to mitigate any adverse aesthetic impacts of the Specific Plan.

The design provisions of the Specific Plan are intended to assure that the quality and appearance of development will not only satisfy the visual criteria of CEQA and the aesthetic standards of the City, but also the short- and long-term desire of residents for distinct and attractive neighborhoods. That has been a strong element in the evolution of the Specific Plan design guidelines, which will provide on-going guidance to the Design Review Board, the City Planning Commission and the City Council as individual projects are proposed for consideration and approval once the Specific Plan is adopted.

The City's Design Review Board will be the principal implementing agency of the design guidelines in the Specific Plan. All projects and specific development that come before the Board will be considered in light of those guidelines. The Board may refine a project's site layout, building plans, landscaping, building design and handling of specific site and project features in the course of design review, to assure consistency of individuals projects with the direction adopted the Specific Plan.

Mitigation Measure L2a The City of Antioch should take steps, as part of its participation in planning for the SR 4 Bypass, to assure that sound attenuation elements of the Bypass satisfy the city's design guidelines.

Implementation of Mitigation Measures L1, L2a and L2b would reduce potential visual impacts of the project to a less-than-significant level.

CHAPTER IV

OTHER ENVIRONMENTAL CONSIDERATIONS

IV.A SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF THE PROJECT IS IMPLEMENTED

The proposed Specific Plan incorporates measures that would avoid or reduce potential impacts to the environment. This EIR also recommends additional mitigation measures throughout the technical analyses of Chapter III. The combined effect of these two groups of mitigation measures would reduce to a level of insignificance all but one adverse impact expected to result from implementation of the proposed Specific Plan.

The impact on regional air quality resulting from implementation of the proposed Specific Plan cannot be mitigated to a less than significant level. Even with the adoption of mitigation measures requiring compliance with the air quality policies set forth in the Antioch General Plan, and implementation of the City's Transportation Demand Management ordinance, regional air quality impacts would only be reduced 10 to 15 percent. This reduction is not enough to mitigate the impact on regional air quality to a less than significant level.

IV.B SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES WHICH WOULD BE INVOLVED IN THE PROPOSED PROJECT SHOULD IT BE IMPLEMENTED

The only technically irreversible changes associated with the proposed project would stem from consumption of non-renewable energy resources (gasoline, natural gas and electricity) and the commitment of materials (wood, concrete, metal and plastic) during construction and operation of the project. Other impacts would be irreversible in a practical sense – that is, they would be technically capable of being reversed, but the cost of doing so would make the likelihood of such a change very low. None of these changes constitute a significant adverse impact as defined by CEQA.

IV.C ENVIRONMENTAL EFFECTS FOUND NOT TO BE SIGNIFICANT

This environmental impact report addresses, in Chapter III, the impacts of the project on those environmental topics which, through project scoping, were expected to pose the possibility of significant environmental effects. Significant environmental impacts have been identified in all environmental subject areas addressed in Chapter III except Land Use.

A number of environmental topics that are included in the standard CEQA checklist have not been addressed under separate subject headings in Chapter III. Those topics, and the reasons for their absence as specific subjects in Chapter III, are as follows:

- ❒ Light and Glare — The potential for light and glare impacts is addressed in subchapter III.L, Visual Resources. Antioch's design review policies and procedures are expected to mitigate any possible light and glare impacts to a less-than-significant level.

- ❒ Natural Resources, Energy — The project is not expected to have an adverse effect upon natural resources and energy beyond those identified in subchapter IV.B.

- ❒ Risk of Upset — Any risk of upset associated with the project is encompassed within the review of potential public health impacts in subchapter III.G.

- ❒ Population and Housing — Encompassed within the land use assessment, subchapter III, A.

- ❒ Recreation — The site area is not currently a recreational resource, so no adverse effects on existing recreational resources would result from implementation of the project. In fact, implementation of the project would create new recreational resources (a neighborhood park and the development of the Lindsay Detention Basin as a community recreational facility).

CHAPTER V

CUMULATIVE AND GROWTH INDUCING IMPACTS

V.A CUMULATIVE IMPACTS

V.A.1 Definition of Cumulative Impacts

The California Environmental Quality Act (CEQA) requires that EIRs contain an evaluation of a project's cumulative impacts. Cumulative impacts occur when the environmental effects of the proposed project, in conjunction with impacts resulting from other closely related past, present or reasonably foreseeable future projects, increase existing impacts or combine to yield new impacts. Cumulative impact analysis required by CEQA is based on the recognition that the environmental impacts of a proposed project cannot be considered in a vacuum. Rather, changes in the environment could result from the incremental impact of what could be two or more individually minor but collectively significant projects taking place over a period of time.

V.A.2 Approach

This EIR examines cumulative impacts for those topical areas addressed in Chapter III which hold the potential to produce significant adverse impacts. Potential cumulative impacts in the areas of land use, transportation, air quality, noise, infrastructure and wildlife and vegetation impacts are analyzed below, using the same letter designation for each topic as is used in Chapter III, and discussing the topics in the same sequence. Cumulative impacts in the following topical areas would not be significant, as the potential impacts of the proposed Specific Plan, together with impacts of the other development considered in the cumulative impact analysis, can all be mitigated to levels of insignificance: geology, soils and seismicity; flooding and drainage; pubic health and safety; public services; cultural resources; visual resources; and energy.

a. Land Use. Cumulative analysis of land use impacts relates to the conversion of lands historically in agricultural use (grazing), in combination with other conversions anticipated to occur over the planning horizon for the project. Mitigation of cumulative impacts relies on planning agency policies and their implementation.

b. Transportation. The cumulative analysis of impacts on transportation is based on the levels of growth projected to occur by the year 2010 under the East County Model Forecast (1994). Methodology, project phasing, and access/circulation assumptions for the cumulative condition are discussed in Chapter III, *Transportation* (pp. 22-70).

Documentation of specific growth assumptions in the East County traffic model for cumulative analysis is presented in Appendix C.

c. Air Quality. Cumulative conditions for air quality are accounted for in Bay Area Air Quality Management District standards for determination of significance, which are reflected in the Chapter III air quality analysis.

d. Noise. The basis for the assessment of cumulative transportation noise impacts is the same as that described for cumulative transportation impacts, described above.

i. Infrastructure. The approach to cumulative impacts on infrastructure is to identify those areawide services—specifically, water supply and wastewater treatment—which could potentially face capacity limitations over the time frame of development within the planning area, and evaluate whether there is sufficient capacity to accommodate the growth anticipated. Local and site related infrastructure impacts are identified in Chapter III. Both infrastructure analyses were undertaken by the EIR infrastructure consultant, McGill·Martin·Self.

j. Vegetation and Wildlife. Cumulative effects on vegetation and wildlife have been examined using both a list approach and a projection approach: a list of past, present, and reasonably foreseeable projects has been prepared and the Contra Costa County General Plan open space element (65/35 Plan) has been consulted.

(1) List Approach. Projects considered in the list approach are located within or immediately to the east of the foothills of the Inner Coast Ranges (see Figure 32, p. 168, and Table 30, p. 167). Past projects are shown within the city limits of Brentwood and Antioch, but not detailed within Table 30. Current and reasonably foreseeable projects are listed in Table 30 and shown on Figure 32. Most of the projects are located in eastern Contra Costa County, although one project in western San Joaquin County has also been included (i.e., Mountain House).

Most of the acreage on each property will be developed, with the exception of the Byron Sand Plant where only 50 additional acres of the approximately 1,400 acres owned or leased by the Unimin Corporation are proposed for expansion (Contra Costa County 1992).

(2) Projection Approach. Contra Costa County voters adopted Measure C (1990) in November 1990, which established a 65/35 Land Preservation Standard. This standard limits urban development in the County to no more than 35 percent of the land in the County, irrespective of future amendments to the County General Plan. The County General Plan established an Urban Limit Line (ULL), the location of which is described in Chapter II.G (p. 14), as a major vehicle to implement the 65/35 plan. The potential cumulative effects of development within that ULL are also discussed.

V.A.3 Cumulative Impact Summary

a. Land Use. Cumulative land use impacts would occur as a result of the conversion of agricultural lands to urban use, which would contribute incrementally to the loss of agricultural lands on a region-wide basis (*Antioch Infrastructure Plan* EIR, p. 214). Antioch's designation of Future Urbanization Area #2 for development is not inconsistent with the County's agricultural and open space preservation policy, because it lies on the side of the line within which urban development may be considered. Given the continued commitment of Contra Costa County to the 65/35 planning concept, and the fact that designation of this site for urban uses is not inconsistent with that concept, cumulative impacts on agricultural resources are considered to be reduced to a less-than-significant level.

Continued implementation of Contra Costa County's 65/35 planning concept, together with implementation of local jurisdiction land use policies consistent with that standard, would reduce cumulative impacts on agricultural lands to a less-than-significant level.

b. Cumulative Transportation Impacts.

(1) Trip Generation and Distribution. As with the Long Term (Recent Trends) scenario, the cumulative condition (East County Model Forecast) would generate about 5,000 vehicle trips in the AM peak hour.

Table 30

Cumulative Project List

Project/Site	Acreage
Cowell Ranch	4,277
Antioch Future Urban Area #1	2,700
Antioch Future Urban Area #2	800
A.G. Spanos Brentwood Hills Country Club	750
Brentwood General Plan Area (outside of city limits)[a]	14,720
Byron Sand Plant/Unimin Corporation	50
Kellogg Reservoir Site[b]	2,510
Los Vaqueros Reservoir Site[b]	4,816
Mountain House New Town	4,667

[a] This is a comprehensive total that includes all of the Spanos property and portions of the Cowell Ranch.
[b] Alternate sites, only one to be developed.

Table 31

Trip Generation Summary
AM and PM Peak Hours

	AM Peak Hour			PM Peak Hour		
	External Trips	Internal Trips	Total	External Trips	Internal Trips	Total
Long Term (East County Model Forecast - Phase II)	4,575	428	5,003	5,704	732	6,436

Source: DKS Associates

About 428 trips would be internal to the project site. The project would generate about 6,436 vehicle trips in the PM peak hour, of which 732 trips would be internal to the project site. Table 31 presents these trip generation projections.

Trip distribution for travel to and from the planning area in the Long Term is shown in Table 32. Approximately 8 to 12 percent of the project's peak period traffic is expected to remain onsite. By far the greatest trip distribution is to other areas of Antioch, with over 40 percent of AM and PM peak hour trips.

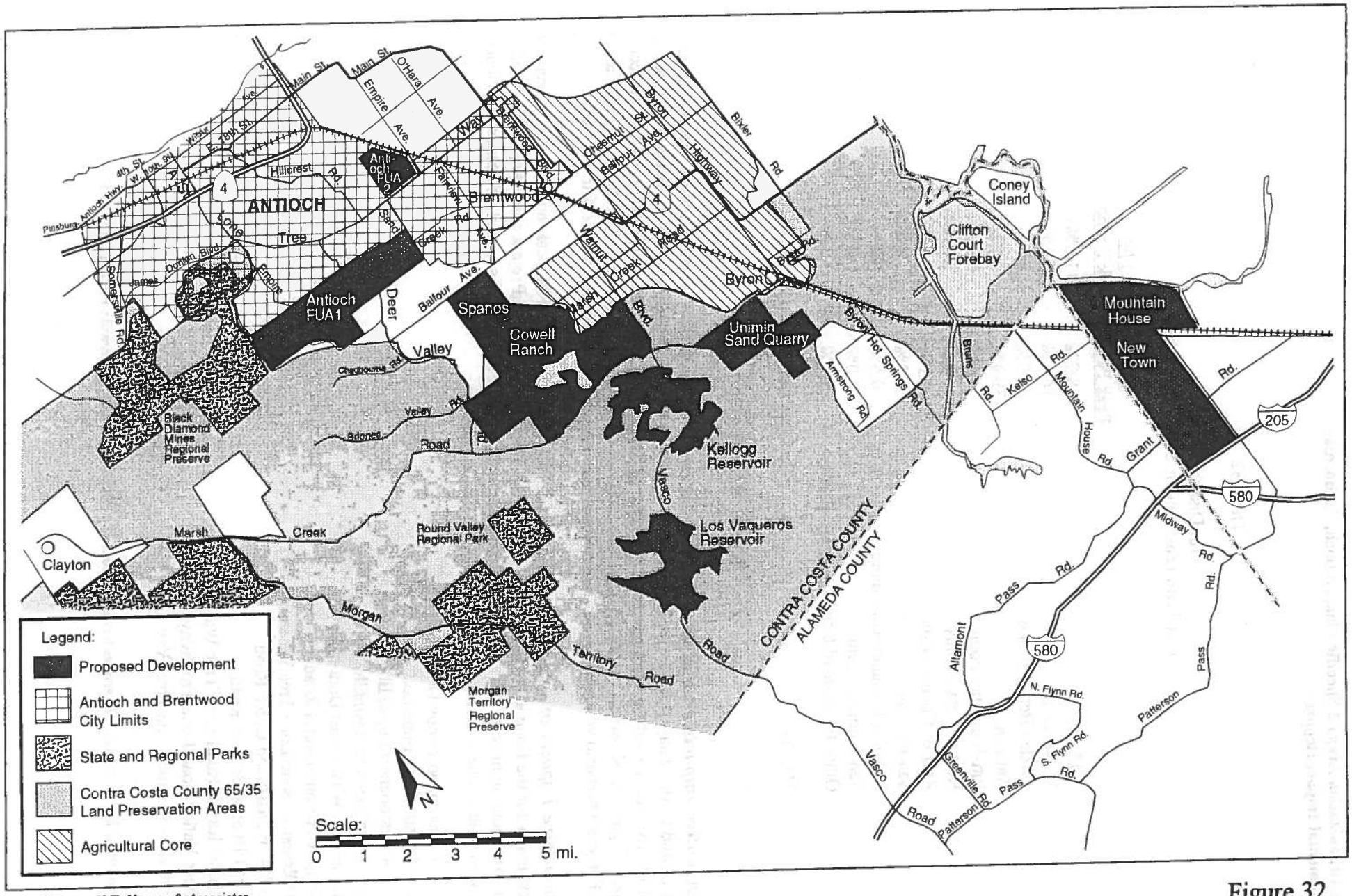

Legend:
Proposed Development
Antioch and Brentwood City Limits
State and Regional Parks
Contra Costa County 65/35 Land Preservation Areas
Agricultural Core
Scale:
0 1 2 3 4 5 mi.
N
ANTIOCH
Brentwood
Antioch FUA1
Antioch FUA2
Spanos
Cowell Ranch
Unimin Sand Quarry
Byron
Clifton Court Forebay
Coney Island
Mountain House
New Town
Kellogg Reservoir
Los Vaqueros Reservoir
Round Valley Regional Park
Morgan Territory Regional Preserve
Black Diamond Mines Regional Preserve
Clayton
CONTRA COSTA COUNTY
ALAMEDA COUNTY
Main St.
Empire Ave.
O'Hara Ave.
Hillcrest Rd.
Lone Tree Way
Deer Valley Rd.
Balfour Ave.
Marsh Creek Rd.
Byron Hwy.
Byron Hot Springs Rd.
Bruns Rd.
Kelso Rd.
Mountain House Rd.
Grant Line Rd.
Midway Rd.
Altamont Pass Rd.
N. Flynn Rd.
S. Flynn Rd.
Greenville Rd.
Patterson Pass Rd.
Vasco Road
Morgan Territory Road
Marsh Creek
Kellogg Creek
Sand Creek
Walnut Blvd.
Somersville Rd.
Contra Loma Blvd.
Empire
Hillcrest
Chichibou
Valley
Bldonee
Armstrong Rd.
Vasco
Pittsburg Antioch Hwy
4th St.
W. 10th St.
E. 18th St.
Wilbur Ave.
James Donlon Blvd.
Lone Tree Way
Sand Creek Rd.
Fairview Ave.
Brentwood Blvd.
Chestnut St.
Balfour Ave.
Byron Highway
Bixler Rd.
Walnut Creek
Marsh Creek Rd.
Byron Hot Springs Rd.
Armstrong

Table 32

Trip Distribution
Long Term (East County Model Forecast)

	AM Peak Period	PM Peak Period
FUA #2	8.7%	11.5%
Brentwood	16.8%	16.1%
Oakley/Bethel Island	15.9%	13.7%
Antioch	39.4%	44.5%
Pittsburg/Bay Point	4.5%	4.2%
Rest of East County	2.2%	1.6%
Rest of Contra Costa	5.0%	3.5%
San Ramon	3.3%	1.4%
Dublin/Pleasanton/Livermore	0.5%	0.4%
San Joaquin County	0.0%	0.0%
Other (Outside of Contra Costa County)	3.8%	3.1%
TOTAL	100.0%	100.0%

Source: DKS Associates

(2) Cumulative Impacts on Highways Traffic Service Objectives.[67] Table 33 shows the estimated travel time and traffic delay index for Without Project and Project traffic volumes on five regional roadways. None of the five study roadways exceeds the traffic index threshold for either the Without Project or Project scenarios. Figure 33 shows the local peak hour traffic volumes on study roadways for Long Term (East County Forecast) scenario with and without Project traffic and Figure 34 shows regional traffic volumes.

(3) Cumulative Impacts on Intersections. Table 34 shows the AM and PM peak hour level of service (LOS) estimates for the Long Term (East County Forecast) Without Project and Project conditions. Figure 35 shows intersections significantly impacted by the project. A total of 12 intersections would operate at deficient conditions in at least one peak hour for the Without Project scenario:

- SR 4 westbound ramps/Lone Tree Way
- SR 4 eastbound ramps/Lone Tree Way
- SR 4 westbound ramps/Hillcrest Avenue
- SR 4 eastbound ramps/Hillcrest Avenue
- Lone Tree Way/James Donlon Boulevard
- Empire Avenue/Laurel Road
- Hillcrest Avenue/Lone Tree Way
- SR 4 Bypass/Sand Creek Road
- SR 4 Bypass/Balfour Road
- Dallas Ranch Road/Lone Tree Way
- Deer Valley Road/Lone Tree Way
- Fairview Avenue/Lone Tree Way

[67] The *Action Plan Traffic Service Objectives* have been formally adopted into the Countywide Plan in July 1995.

Table 33

Travel Time and Traffic Delay Index Summary
Long Term (East County Model Forecast)

		Travel Times[a]						
		Off-Peak Hour		AM Peak Hour		Traffic Delay Index[b]		
Location	Peak Direction	Without Project	Project	Without Project	Project	Without Project	Project	Thres -hold
SR 4 Freeway Between SR 160 & Kirker Pass Rd	West-bound	8.33	8.33	14.69	13.62	1.76	1.64	3.0
SR 4 Bypass Between SR 160 & Balfour Rd	South-bound	5.63	5.63	5.66	5.69	1.01	1.01	3.0
Marsh Creek Rd Between Deer Valley Rd & Kirker Pass Rd	West-bound	20.69	20.69	27.04	27.18	1.31	1.31	2.0
Vasco Rd Between Camino Diablo Blvd & I-580	South-bound	19.67	19.67	43.61	40.05	2.22	2.22	3.0
Kirker Pass Rd Between SR 4 & Clayton Rd	South-bound	12.05	12.05	13.63	13.78	1.13	1.14	2.0

[a] In minutes.
[b] Calculated by dividing the AM peak hour travel time by the off-peak travel time.

Source: DKS Associates

The addition of project traffic would worsen deficient conditions at all 12 locations listed above **[This would be a significant impact]**.

The following intersections would deteriorate to deficient level of service conditions as a result of the Project:

- Deer Valley Road/New Sand Creek Road
- Sunset Drive/Lone Tree Way
- Sand Creek Road/Lone Tree Way
- Empire Avenue/Laurel Road
- Hillcrest Avenue/Laurel Road
- Dallas Ranch Road/New Sand Creek Road
- Deer Valley Road/Hillcrest Avenue

[Deterioration of conditions to deficient levels of service at the above listed seven intersections would constitute a significant impact].

Traffic conditions at several intersections would improve as a result of the project. All of these intersections would continue to operate at acceptable conditions. It is noted that Sunset Drive/Wild Horse Drive would operate at deficient conditions in the Near Term Project scenario and acceptable conditions in the Long Term (East County Forecast) Project scenario.

The following intersections would meet the peak hour signal warrant in at least one peak hour in the Without Project scenario:

- Lone Tree Way/Sand Creek Road
- Fairview Avenue/Sand Creek Road
- Empire Avenue/Laurel Road
- O'Hara Avenue/Laurel Road
- O'Hara Avenue/Lone Tree Way
- Empire Avenue/Lone Tree Way
- Sunset Drive/Laurel Road

The seven intersections listed above would also meet the peak hour warrant for the Project scenario [**This would be a significant impact**].

The following intersections would meet the peak hour warrant (in at least one peak hour) for the Project scenario:

- Deer Valley Road/New Sand Creek Road
- Deer Valley Road/Balfour Road
- Sunset Drive/Lone Tree Way
- Canada Valley Road/Lone Tree Way
- Dallas Ranch Road/New Sand Creek Road
- Hillcrest Avenue/New Sand Creek Road
- New Sand Creek Road/Kaiser Driveway
- New Sand Creek Road/Zone 451 Residential Access
- New Sand Creek Road/South Dallas Ranch Road
- Dallas Ranch Road/Zone 434 Residential Access
- Deer Valley Road/Kaiser Access
- Deer Valley Road/Zones 434/455 Residential Access
- Hillcrest Avenue/Zones 459/460 Residential Access
- Lone Tree Way/Regional Commercial Driveway
- Lone Tree Way/Regional Commercial Driveway

[Deterioration of conditions to deficient levels of service at the above listed fifteen intersections would constitute a significant impact].

Significant adverse transportation impacts would result from cumulative levels of development. A variety of intersections would deteriorate to deficient levels of service or meet signal warrants.

Table 34

Peak Hour Levels of Service and V/C Ratios
Long Term (East County Model Forecast)

		AM Peak Hour				PM Peak Hour			
		No Project		With Project		No Project		With Project	
Intersection	Control	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
1 Somersville/Buchanan	s	0.52	A	0.53	A	0.67	B	0.71	C
2 SR 4 WB Ramps/Lone Tree Way	s	0.87	D	**0.98**	E	0.67	B	0.73	C
3 SR 4 EB Ramps/Lone Tree Way	s	0.65	B	0.73	C	1.00	E	**1.11**	F
4 Dallas Ranch Rd./Lone Tree Way	u	0.74	C	**1.16**	F	1.02	F	**1.43**	F
5 SR 4 WB Ramps/Hillcrest Ave.	u	1.09	F	**1.16**	F	0.98	E	**1.04**	F
6 SR 4 EB Ramps/Hillcrest Ave.	u	1.04	F	**1.19**	F	1.60	F	**1.67**	F
7 Deer Valley Rd./Hillcrest Ave.	s	0.51	A	0.55	A	0.81	D	**0.89**	D
8 Deer Valley Rd./Lone Tree Wy.	s	0.66	B	**0.86**	D	0.86	D	**1.13**	F
9 Deer Valley Rd./Balfour Rd.	u	0.38	A	0.49	A	0.46	A	0.61	B
10 Walnut Blvd/Balfour Rd	s	0.31	A	0.31	A	0.36	A	0.36	A
11 Fairview Ave./Sand Creek Rd.	u	0.53	A	0.54	A	0.47	A	0.56	A
12 Walnut Blvd./Marsh Creek Rd.	s	0.69	B	0.66	B	0.61	B	0.59	A
13 Empire Ave/Laurel Rd	u	1.13	F	**1.22**	F	0.86	D	**0.96**	E
14 O'Hara Ave/Laurel Rd	s	0.39	A	0.38	A	0.38	A	0.37	A
15 SR 4/Laurel Rd	u	0.22	A	0.22	A	0.27	A	0.27	A
16 O'Hara Ave/Lone Tree Wy	u	0.68	B	0.84	D	0.63	B	0.71	C
17 Fairview Ave/Lone Tree Wy	s	0.68	B	0.80	C	0.90	D	**0.99**	E
18 SR 4/Lone Tree Wy	s	0.41	A	0.48	A	0.53	A	0.58	A
19 Hillcrest Ave./Laurel Rd.	s	0.46	A	0.64	B	0.64	B	**0.92**	E
20 Hillcrest Ave/Lone Tree Wy	s	0.91	E	**0.96**	E	0.91	E	**1.06**	F
21 Sand Creek Rd/Lone Tree Wy	u	0.44	A	0.78	C	0.55	A	**0.91**	E
22 Empire Ave/Lone Tree Wy	u	0.52	A	0.67	B	0.47	A	0.60	A
23 Canada Valley Rd. /Lone Tree Wy	u	0.23	A	0.46	A	0.27	A	0.63	B
24 Hillcrest Ave./New Sand Creek Rd. *	u	-		0.52	A	-		0.65	B
25 Deer Valley Rd./New Sand Creek Rd.*	u	-		0.68	B	-		**1.02**	F
26 Canada Valley Rd./Laurel Rd.	u	0.13	A	0.20	A	0.14	A	0.21	A
27 Sunset Drive/Laurel Rd.*	u	0.63	B	0.71	C	0.59	A	0.73	C
28 Lone Tree Wy./J. Donlon Blvd.	s	0.94	E	**1.12**	F	1.12	F	**1.41**	F
29 SR 4 Bypass sb ramp/Laurel Rd.	s	0.35	A	0.68	B	0.64	B	0.73	C
30 SR 4 Bypass nb Ramp/Laurel Rd.	s	0.59	A	0.56	A	0.47	A	0.51	A

* Intersection does not exist in No-project scenarios

(*Continued on next page*)

† Not an intersection in Phase I

Numbers in **bold** denote a significant impact.

Abbreviations

V/C = Volume/capacity ratio
LOS = Level of service
s = signalized control
u = unsignalized control

Table 34

Peak Hour Levels of Service and V/C Ratios
Long Term (East County Model Forecast)
(*Continued*)

		AM Peak Hour				PM Peak Hour			
		No Project		With Project		No Project		With Project	
Intersection	Control	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
31 SR 4 Bypass sb Ramp/Lone Tree Wy	s	0.31	A	0.52	A	0.60	A	0.66	B
32 SR 4 Bypass nb Ramp/Lone Tree Wy	s	0.44	A	0.56	A	0.40	A	0.55	A
33 SR 4 Bypass/Sand Creek Rd.	s	1.25	F	**1.29**	F	1.16	F	**1.31**	F
34 SR 4 Bypass/Balfour Rd.	s	1.63	F	**1.74**	F	1.62	F	**1.70**	F
35 Neroly Rd./Laurel Rd	u	0.19	A	0.20	A	0.22	A	0.22	A
36 Sunset Drive/Wild Horse Rd.	u	0.18	A	0.19	A	0.26	A	0.30	A
37 Sunset Drive/Lone Tree Way	u	0.45	A	**0.94**	E	0.41	A	0.67	B
38 Empire Avenue/Sand Creek Rd.	u	0.34	A	0.38	A	0.37	A	0.48	A
39 Dallas Ranch /New Sand Creek Rd.*	u	-		**0.92**	E	-		**0.93**	E
40 South Dallas Ranch Road/New Sand Creek Rd.*	u	-		0.46	A	-		0.52	A

* Intersection does not exist in No-project scenarios
† Not an intersection In Phase I
Numbers in **bold** denote a significant impact.

Note: The intersections of Hillcrest Avenue with the State Route 4 ramps are currently unsignalized, with poor levels of service on minor street approaches. They are shown in this table as if they were signalized in order to facilitate comparison among alternatives.

Abbreviations

V/C = Volume/capacity ratio
LOS = Level of service
s = signalized control
u = unsignalized control

Source: DKS Associates

c. Cumulative Air Quality Impacts. The Bay Area is experiencing continued growth in population and vehicle use that will affect the emissions of regional pollutants, such as reactive organic gases and nitrogen oxides. Despite the cumulative growth anticipated for population and vehicle use, regional emissions of these pollutants are projected to decrease in the future. This expected decrease is due to regional programs that are currently in place or under consideration. Continued improvement in regional air quality is projected through the year 2000, although attainment of all air quality standards throughout the entire Bay Area air basin is not projected by the year 2000.

The FUA #2 Specific Plan would contribute to the projected continuation of the violation of standards for emissions of regional pollutants in the Bay Area, which would constitute a significant cumulative air quality impact.

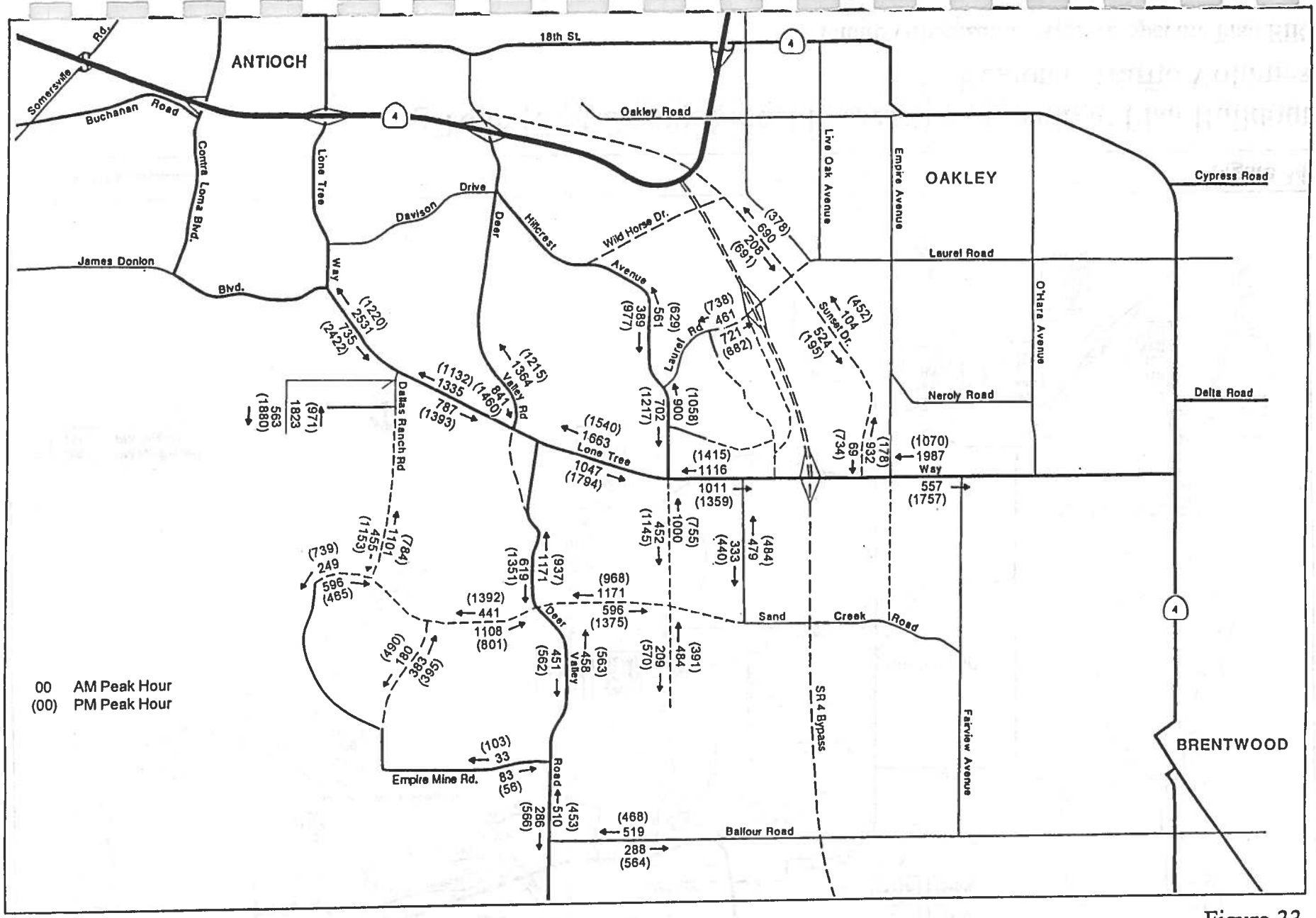


Figure 33

Source: DKS Associates

Long Term (East County Model Forecast) with Plan Buildout Local Traffic Volumes

Future Urbanization Area #2 Specific Plan EIR

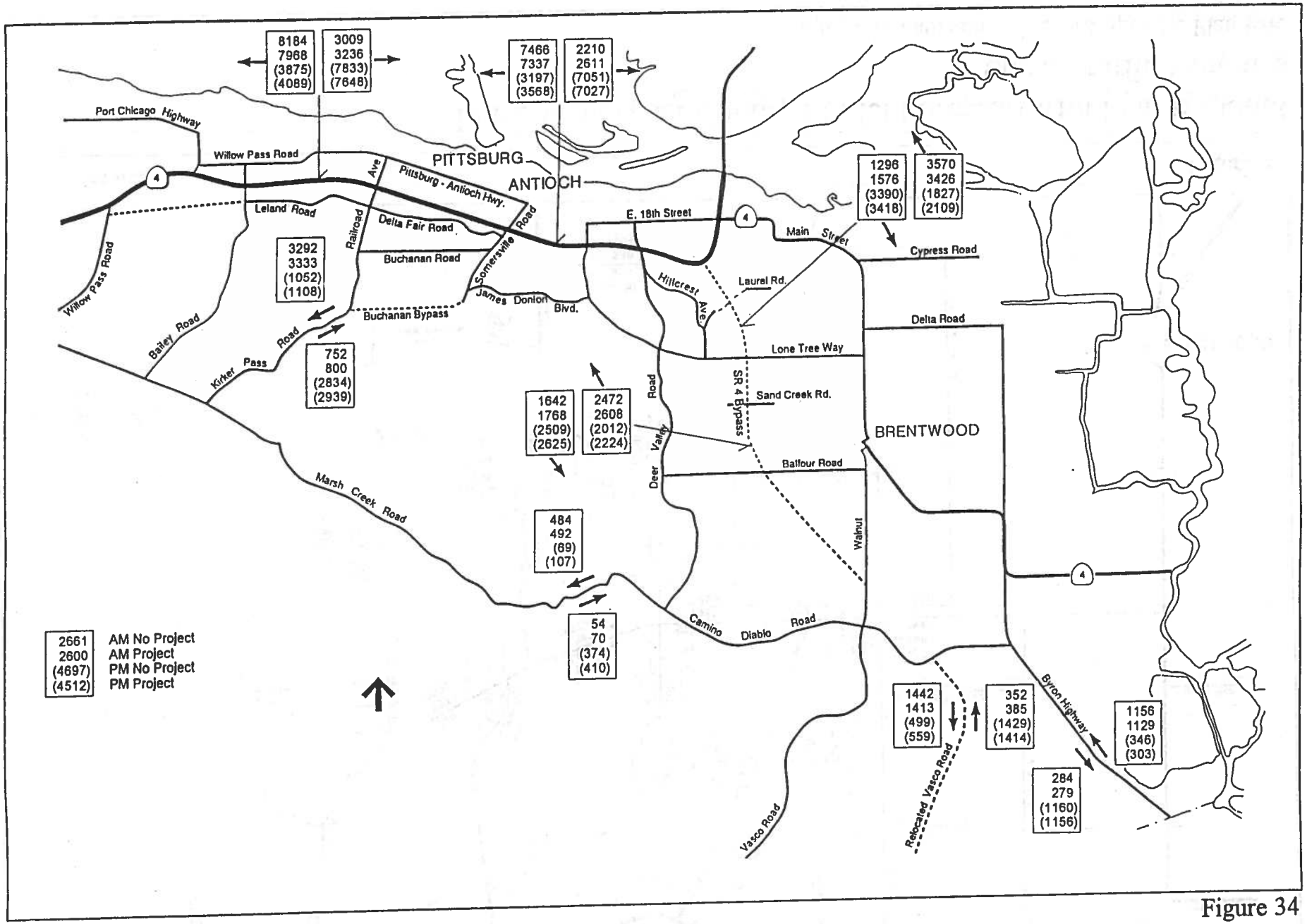


Figure 34

Source: DKS Associates

Long Term (East County Model Forecast) with/without Plan Buildout Regional Traffic Volumes

Future Urbanization Area #2 Specific Plan EIR

d. Cumulative Noise Impacts. The noise analysis presented in Chapter III (pp. 81-90) is based on noise sources that include cumulative levels of traffic (Long Term - East County Model Forecast) as defined in this chapter. Two impacts were found to be potentially significant: (1) construction noise impacts; and (2) exposure of residential developments (primarily along the east side of the SR 4 Bypass) to noise in excess of 60 dBA CNEL. Mitigation measures are recommended to reduce any impacts to less-than-significant levels.

The proposed Specific Plan would add to the cumulative noise levels experienced in the vicinity of the planning area. However, implementation of recommended mitigation measures would reduce the potential impacts to less-than-significant levels.

i. Cumulative Infrastructure Impacts.

(1) Water Supply. The total water use in FUA #2 would likely not exceed the total addressed in the *Antioch Infrastructure Plan* EIR; the total actual use in FUA #2 will be subject to the level of non-residential and residential development ultimately approved.

Antioch has two potential sources to satisfy future water demand within the city: increased use of raw water sources (purchases from Contra Costa Water District and/or withdrawals from the San Joaquin River) combined with treatment at the city's water treatment plant, or purchase from Contra Costa Water District of water treated at CCWD's new Randall-Bold Plant. The latter facility currently has approximately 25 million gallons per day (MGD) available for purchase. Increased use of raw water would require expansion of Antioch's water treatment capacity beyond approximately the year 2000. The city was using about 22 MGD of the 28-30 MGD capacity of its treatment plant at the time the *Antioch Infrastructure Plan* was prepared in 1992. According to the Water System Master Plan Update prepared by Brown and Caldwell in 1991, the configuration of the plant can accommodate expansion up to 61-66 MGD, which is more than adequate for expected maximum day demand through 2030. If the city chooses to expand its supply by acquiring raw water and treating it, a decision to expand the treatment plan would have to be made by 1997, so that the expansion could be brought on line in advance to projected demand.

Given the choices available, no adverse cumulative impact is found for development as envisioned by the proposed FUA #2 Specific Plan.

(2) Wastewater Treatment. The total wastewater generation in FUA #2 would likely not exceed the total addressed in the *Antioch Infrastructure Plan* EIR; the total actual generation in FUA #2 will be subject to the level of non-residential and residential development ultimately approved.

Wastewater treatment for Antioch is the responsibility of the Delta-Diablo Sanitation District (DDSD), which operates a 16.5 MGD capacity plant of which, at the time the *Antioch Infrastructure Plan* was prepared (1992), approximately 11.0 MGD was being used. Infrastructure assessment work by Brown and Caldwell for the *Infrastructure Plan* EIR indicated that the DDSD could accommodate FUA #2 growth at the time the *Plan* was prepared, and had plans to expand its capacity to serve buildout of both FUAs #1 and #2; the design capacity of the plant is approximately 22.5 MGD.

Given the availability of existing and potential treatment capacity, no adverse cumulative impacts are found for development envisioned by the proposed FUA #2 Specific Plan.

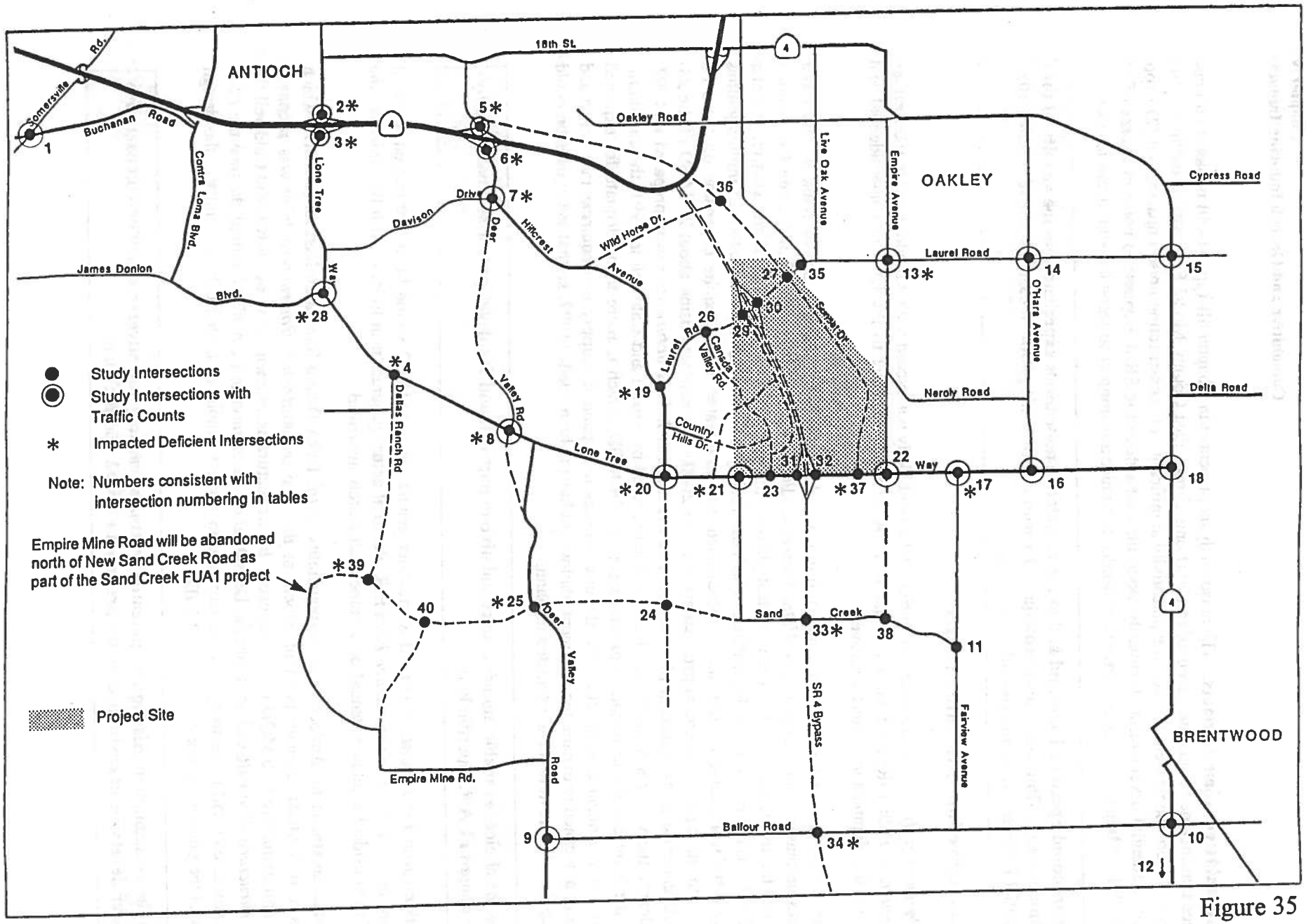


Figure 35

Source: DKS Associates

Long Term (East County Model Forecast) with Plan Buildout
Study Intersections Significantly Impacted by the Project

Future Urbanization Area #2 Specific Plan EIR

j. Cumulative Vegetation and Wildlife Impacts.

(1) Loss of Biotic Habitats. The developments listed in Table 29 (p. 167) would together convert 30,474-32,779 acres of open space to developed uses during the time of their scheduled construction. Habitat losses could include agricultural lands (orchards, row crops, pastures), non-native annual grassland, blue oak woodland/savanna, valley sink scrub, vernal pools, freshwater marsh, and mixed riparian forest. Additional, unquantified acreage, would be lost if development extended to the limits of the ULL.

Blue oak woodland, Valley sink scrub, vernal pools, freshwater marsh, and mixed riparian forest are absent from FUA #2. Therefore, the development of some or all of the planning area would not exacerbate losses to these habitats. Development in FUA #2 could contribute to the regional loss of agricultural lands, non-native annual grassland, and chamise chaparral, depending on the configuration of site development. Impacted habitats have been substantially modified by past land use practices (tilling, grazing, rodent control programs, etc.). Relatively few native plants are found in these habitats. Grazing has so reduced the cover provided by annual grasses that the value of these habitats to wildlife is relatively low. Thus, the regional effects on these biotic habitats resulting from the development of FUA #2 are expected to be less than significant.

(2) Special-Status Species. There are no site-specific impacts to special status plants predicted for FUA #2, therefore no cumulative effects are anticipated.

The planning area provides degraded habitat of marginal value for a number of special status animals. These species have special status for a variety of reasons, but generally numbers of individuals are low and populations are scattered. In some cases, this is because the species are adapted to a narrow niche of environmental conditions which do not commonly occur. In others, native habitats which were once abundant have been eliminated for agriculture or development. Generally, any additional losses of these species are cumulatively significant. Therefore, no attempt was made to quantify losses per the "list approach" at other developments. Full development of FUA # 2 may contribute to the regional decline in the populations of these species, to the extent that these species may occur on the project sites. Any contribution made to this decline by the development of FUA #2 is considered a significant cumulative effect.

An aggressive rodent control program begun in the 1950s and continued into the late 1970s apparently virtually eliminated California ground squirrels from all of FUA #2, and on-going control has prevented recolonization. Therefore, predators dependent on this rodent for prey are unlikely to extensively use this site for foraging. Other species which dwell in ground squirrel burrows are generally absent as well. FUA #2 is likely to see limited use, at most, by the Burrowing Owl, Golden Eagle, and badger. Burrows created by fossorial (burrowing) mammals were absent. No Burrowing Owls were observed in the entire study area.

Therefore, the development of FUA #2 will make no significant contribution to the decline of these species within eastern Contra Costa County.

A number of other species (Ferruginous Hawk, Townsend's western big-eared bat, and California mastiff bat) may use the study area incidentally. FUA #2 does not, however, provide these species critical habitat. Development of the area will not contribute significantly to the loss of important habitat for these species.

FUA #2 provides breeding and foraging habitat for the California Horned Lark and the Loggerhead Shrike. The California Horned Lark is widespread in rural habitats of central California, breeding in agricultural fields and grazed annual grasslands. The Loggerhead Shrike population has declined in some portions of the United

States during the past 20 years. This species is still common in California. Development of FUA #2 will eliminate some breeding and foraging habitat for these two species. Considerable habitat of suitable quality will remain for both species in designated open space areas and agricultural lands, even if all the proposed projects in Table 29 are constructed. Therefore, the development of FUA #2 will make a less than significant contribution to the cumulative effects of regional development on these species.

The proposed project would not contribute significantly to any cumulative impacts on wildlife habitat or special status plant and animal species.

V.B GROWTH INDUCING IMPACTS

V.B.1 Definition of Growth Inducing Impacts

The California Environmental Quality Act (CEQA) requires (§15126(g)) that an EIR address the ways in which the proposed project could either directly or indirectly lead to economic or population growth, or the construction of additional housing in the surrounding environment. A project may be considered growth-inducing if it removes obstacles to growth or encourages other activities that cause significant environmental effects. Analysis of growth-inducing impacts must evaluate both individual and cumulative environmental effects.

V.B.2 Approach

The *Antioch Infrastructure Plan* provides a blueprint for growth within the study area. Whether the proposed Specific Plan would generate growth in the surrounding environment depends largely on whether infrastructure needed for development under the plan would be used by, or extended to, lands outside of the study area.

The potential for growth to occur on lands near the study area would also be determined by the land use policies that govern those lands.

V.A.3 Growth Inducing Impacts Summary

The public services and infrastructure impacts analysis presented in Chapter 3 of this report describe the system expansions that are envisioned as assuring the adequacy of community facilities and services to the Specific Plan area. Some planned infrastructure improvements may be designed with sufficient capacity to serve both FUA #2 and portions (or all) of the Sand Creek Specific Plan Area (FUA #1), at least on a temporary basis, to assist in the coordinated phasing of development in the two areas. This relationship is reciprocal: certain capital facilities in the Sand Creek Specific Plan Area may be designed with capacity to serve all of part of FUA #2 on a temporary (or permanent) basis. The capital facilities for the two areas have been engineered in tandem, consistent with the concept of joint planning for these areas which has been Antioch's consistent approach.

Since both these areas not only are within the planning area and the sphere of influence, but also have been annexed to the City, the infrastructure extensions required to serve them represent the implementation of Antioch's General Plan of 1988. This is planned growth, rather than growth unintentionally induced.

East and south of FUA #2 lie lands within the planning area of Brentwood, which would have the responsibility of directing growth there. Antioch will not extend urban services or roads into Brentwood. Similarly, extension of roads or urban services in a northeasterly direction (toward Oakley) is not planned by the City, but would be under the aegis of Contra Costa County.

In conclusion, while the FUA #2 Specific Plan would accommodate the growth the plan itself provides for, it would not be growth inducing with regard to other areas.

CHAPTER VI

ALTERNATIVES

VI.A INTRODUCTION

VI.A.1 Background

The California Environmental Quality Act (CEQA) requires (1) that an EIR describe a range of reasonable alternatives to the proposed project, or to its location, that could feasibly attain the project's basic objectives, and (2) that it evaluate the comparative merits of each alternative (*Guidelines* §15126(d); Public Resources Code §21100(d)).

The discussion of alternatives is intended to focus on alternatives capable of either eliminating any significant adverse environmental effects or reducing remaining adverse effects to a level of insignificance, even if such alternatives would be more costly or to some degree would impede the project's objectives. One of the alternatives must be the "no project" alternative. The identification of alternatives need not be exhaustive, but rather is governed by the "rule of reason" which requires an EIR to set forth only those alternatives necessary to permit a reasoned choice.

In addition to analyzing a reasonable range of alternatives to the project, the alternatives must be feasible (that is, capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors). Ultimately, the key is to select and discuss alternatives that will foster informed decision-making and informed public participation (CEQA §21100(d); *Guidelines* §15126(d); see *California Environmental Quality Act*, Remy *et al.*, 1993 edition, pp. 206-209).

VI.A.2 Selection of Alternatives

The project alternatives evaluated in this chapter include a range of land use programs and variety in siting sufficient to illustrate differences in impacts compared to the proposed Specific Plan.

Alternative 1 is the no project alternative, consideration of which is required by CEQA.

Alternatives 2, 3 and 4 are based on the three preliminary alternative plans that were formulated by the Specific Plan consultant, ELS/Elbasani and Logan. Each of these plans was structured to illustrate the array and amounts of land uses that could be included given a different emphasis in FUA #2 consistent with adopted City plans and policies for the area. Alternative 2 emphasizes employment, Alternative 3 regional-serving commercial development and Alternative 4 residential development while maintaining a substantial employment base.

Alternative 5 considers qualitatively the consequences of developing a project of equivalent scale somewhere else in eastern Contra Costa, or in western San Joaquin, southern Solano or southern Sacramento County.

VI.A.3 Discussion of Alternatives

In the remainder of this chapter, each alternative is described and its potential impacts are reviewed. The format for consideration of each alternative is similar to that employed for evaluating the proposed Specific Plan in Chapter III, in order to facilitate comparisons between each alternative and the Specific Plan. Where impacts of an alternative are similar to those of the Specific Plan, the reader is referred to the applicable discussion in Chapter III. Similarly, where recommended mitigation measures are the same as for the Specific Plan, those measures are identified in this chapter but the discussion is not repeated.

VI.B ALTERNATIVE 1: NO PROJECT

VI.B.1 Project Description

In this "no project" alternative, no urban development would be permitted in FUA #2. The State Route 4 Bypass, Contra Costa Water District (Las Vaqueros project) pipeline and County facilities (court and judicial facilities) described in Chapter II (p. 8) would not be affected; they could all still be built at some time in the future. Antioch Creek would not be improved and Lindsey Basin would remain at its current size (5 acres) rather than expanded to 30 acres.

VI.B.2 Impacts

Land Use. Alternative 1 would have no effect on land uses in or surrounding FUA #2. Whether and how long the site would remain in its current agricultural uses (grazing on the hills of the western portion, orchards and row crops on the flatter eastern portion) would depend on the continuing financial feasibility of those uses.

Transportation. Alternative 1 would leave trip generation from the planning area at its current levels and not require the various roadway/intersection improvements called for as mitigation for the proposed plan. The SR 4 Bypass could still go forward at some time in the future as an independent project.

Air Quality. Alternative 1 would have no effect on air quality which would remain as it is at present or subject to gradual improvements on the basis of changing technologies and emissions controls.

Noise. The noise environment under this alternative would remain in its current state. Relatively high noise levels exist at points along Lone Tree Way and Hillcrest Avenue in the vicinity of FUA #2 due to the heavy existing traffic volumes on those roadways. Operations on the SPRR tracks would continue to generate noise along the eastern portion of the area. Within the planning area itself, noise would continue at the relatively low levels typical of rural and agricultural land uses in eastern Contra Costa County.

Geology, Soils and Seismicity. This alternative would not result in any change to existing soil or seismic hazards; however structures would not be constructed and additional people would not be exposed to the geologic hazards present in the planning area.

Flooding and Drainage. Under this alternative, the planning area would remain as is, mostly comprised of permeable surfaces allowing infiltration of rain water. This alternative would not require the drainage

infrastructure proposed as part of the specific plan, though the continuing work on the Lindsey Basin and on East Antioch Creek could go forward.

Public Health and Safety. Under this alternative, potential risks associated with construction and with the introduction of new residents and employees to the area would not occur. Any existing sources of hazardous materials (e.g., fuel or agricultural chemical leaks or spills, asbestos-containing materials, abandoned water wells, gas exploration and production wells) would remain in place, but the public health risks associated with development (and prior to mitigation) would not increase as it would under any of the development alternatives.

Public Services. The present relatively low level of demand for public services (typical of rural areas) would continue under this alternative. In the absence of more than 1,300 new dwelling units, 200± acres of employment generating uses and 200± acres of public/quasi-public uses, mitigation such as parks, recreational facilities and schools shown in the proposed plan would not be necessary.

Infrastructure. As with public services, maintaining the planning area in its present land uses would obviate the need for infrastructure improvements called for by the proposed plan.

Vegetation and Wildlife. Impacts on biotic resources associated with urban development would not occur if the "no project" alternative were to be adopted. The seasonal wetlands in the southwestern corner of the property would not be converted to residential or commercial uses, and water quality in East Antioch Creek would not decline from stormwater runoff polluted with grease, oil, heavy metals or other chemical pollutants. Nesting raptors would not be disturbed from construction activities during the breeding season.

If current or future property owners convert existing non-native grassland to orchards, vineyards or croplands, environmental impacts would be similar to those described for the proposed plan. Stormwater runoff entering East Antioch Creek may contain increased amounts of fertilizer, pesticides and herbicides. The expansion of agricultural lands could also eliminate the freshwater seep in the southwestern corner of the planning area. Loss of this small wetland would be considered a significant environmental impact.

Cultural Resources. Adoption of this alternative would have no effect on cultural resources in the planning area.

Visual Resources. This alternative would maintain the present visual characteristics of the planning area until such time as the SR 4 Bypass and County's court and judicial facilities are developed (independently of the specific plan).

II.C ALTERNATIVE 2: EMPLOYMENT EMPHASIS

VI.C.1 Project Description

Alternative 2 emphasizes employment uses and devotes more land area to those uses than does the proposed Specific Plan. Employment uses would occupy 236.1 acres (compared to 122.0 acres in the Specific Plan), and would be located on both sides of the State Route 4 Bypass. Retail uses totaling 51.7 acres (compared to 96.5 acres in the Specific Plan) would be located along Lone Tree Way, and would serve both regional and local markets.

Alternative 2 also includes residential development: it would accommodate a total of 1,022 housing units (compared to 1,322 in the Specific Plan). Of the total, 860 units would be detached single family homes, built at a density of 6 units per acre, and 162 would be attached single family homes, townhouses, garden apartments or similar units, with a density of 10 units per acre.

The remainder of FUA #2 would be devoted to public facilities (12.3 acres), parks (13.7 acres), roadways (134 acres), water district uses (34.1 acres) and open space (143.1 acres), which would be located along the ridgelines and in the vicinity of Lindsey Basin.

The arrangement of land uses in Alternative 2 is shown in Figure 35. The amount of land devoted to each use in Alternative 2 is compared to the distribution in the Specific Plan and the other alternatives in Table 35.

VI.C.2 Impacts

Land Use. The description of Alternative 2 (VI.C.1 and Table 35) summarizes the land uses included in this alternative. When compared to either the existing conditions in the planning area or to the no project alternative, this "employment emphasis" would represent a change in land uses that would be substantial. Compared with the proposed specific plan, this alternative would shift future development toward uses in the *employment*, *community commercial* and *medium density residential* categories and away from *low medium density residential* and *regional commercial* categories. Its *public/quasi-public* uses would remain about the same as the proposed plan, with the exception that no *school* site would be included.

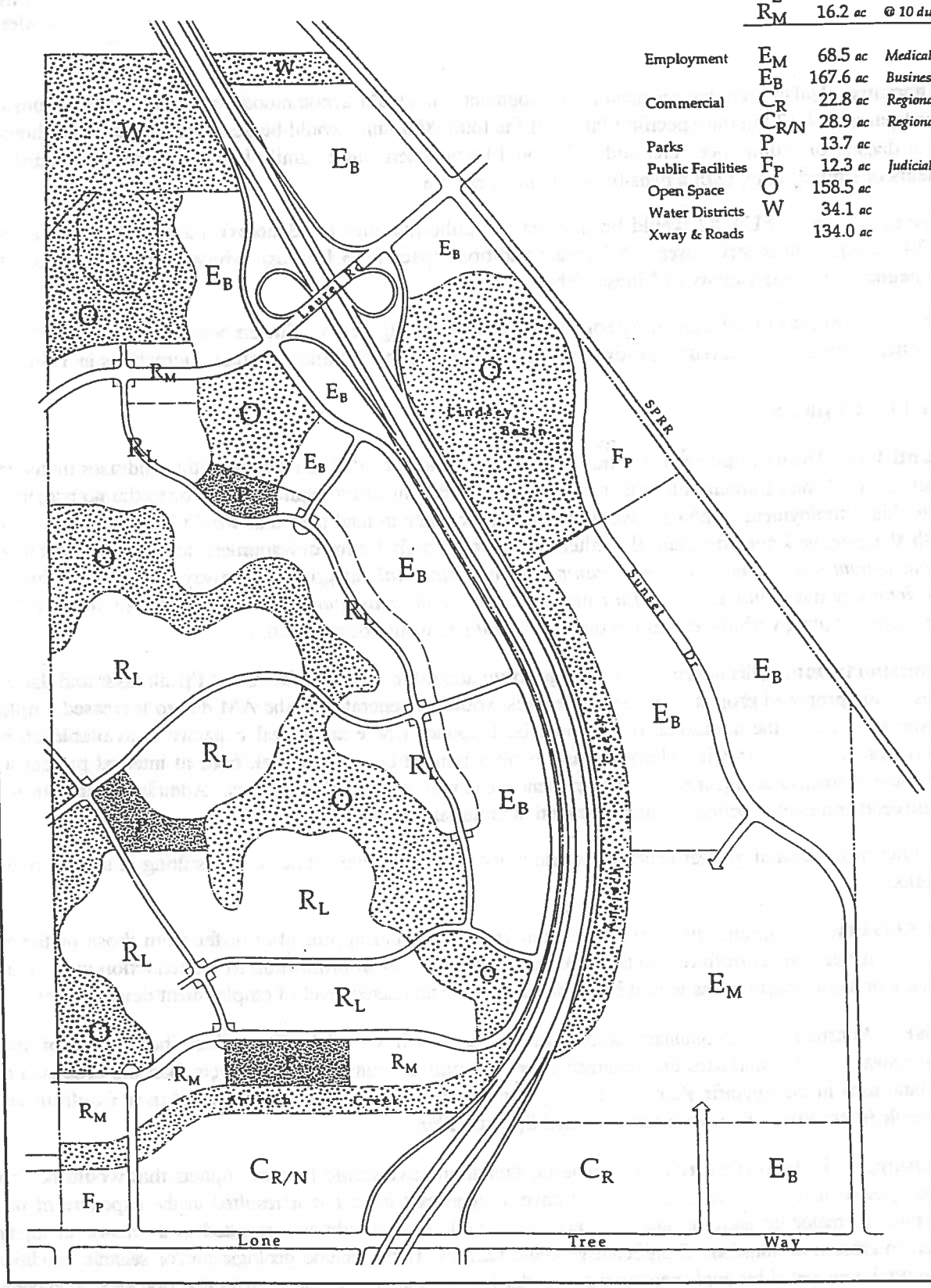
Transportation. This alternative would generate about the same number of PM peak hour and daily vehicle trips as the proposed project. More vehicle trips would be generated in the AM due to increased employment. However, most of the additional trips would be inbound, where additional capacity is available on regional roadways. Increased traffic volumes would be experienced in the AM peak hour at internal project intersections and roadways adjacent to the employment areas west of the SR 4 Bypass. Additional turn lanes may be required at some intersections to accommodate additional AM peak hour traffic.

A higher proportion of project residents would work at the employment centers, resulting in shorter overall trip lengths.

Air Quality. Air quality impacts of Alternative 2 would not appreciably differ from those of the Specific Plan. While emissions from residential sources would be lower in proportion to the reduction in the number of housing units, total emissions would be higher due to the increased level of employment development.

Noise. Alternative 2 emphasizes employment uses which would be located on both sides of the Delta Expressway. These land uses are generally more compatible with high noise levels than the proposed residential land uses in the Specific Plan. Noise impacts resulting from noise sensitive land uses would therefore be less with Alternative 2 than with the proposed Specific Plan.

Geology, Soils and Seismicity. In general, this alternative would lead to impacts that would be similar to the proposed plan. This alternative would have a significant impact if it resulted in the exposure of people or structures to major geologic hazards, resulted in unstable earth conditions, resulted in a change in topography, increased erosion or siltation. Significant geologic hazards would include geologic and/or seismic conditions that could not be mitigated by implementation of standard engineering design or construction practices, non-compliance with Federal and State safety laws and regulations, and/or local grading/excavation regulations. Potential impacts at the project include unstable slopes, erosion, fill settlement, expansive soils and seismic hazards.



Source: ELS/Elbasani & Logan

Figure 36

Land Use Plan for Alternative 2: Employment Emphasis

0 500 1000 2000

Antioch Future Urbanization Area #2 EIR

Table 35

Land Uses: Specific Plan and Alternatives

	Specific Plan ("*Proposed Project*")		Alternative 2 ("*Employment Emphasis*")		Alternative 3 ("*Regional Retail Emphasis*")		Alternative 4 ("*High Density Residential Emphasis*")	
	Acres	Housing Units	Acres	Housing Units	Acres	Housing Units	Acres	Housing Units
Residential								
Low Medium Density[a]	137.4	549						
Medium Density[b]	91.3	548	143.3	860	155.5	933	154.3	926
Medium High Density[c]	15.0	225	16.2	162	23.2	232	46.2	462
High Density[d]					8.3	166	8.2	164
Subtotal	243.7	1,322	159.5	1,022	187.0	1,331	208.7	1,552
Private Nonresidential								
Employment	122.0		236.1		202.6		188.1	
Community Comm'l[e]	24.2		28.9				8.3	
Employment Ctr. Comm'l	11.4							
Regional Comm'l	60.9		22.8		55.9		37.2	
Subtotal	218.5		287.8		258.5		233.6	
Public/Quasi-Public								
Public Facility	10.8		12.3		10.1		10.1	
School	11.3							
Park	9.4		13.7		16.2		17.1	
Open Space	130.0		143.1		144.0		141.9	
Water District Land	34.5		34.1		34.1		34.1	
Subtotal	196.0		203.2		204.4		203.2	
Roadways								
State Route 4 Bypass	83.0							
Arterials & Collectors	43.3							
Subtotal	126.3		134.0		134.6		139.0	
Total	**784.5**	**1,322**	**784.5**	**1,022**	**784.5**	**1,331**	**784.5**	**1,552**

[a] Density up to 4 units per acre.
[b] Density up to 6 units per acre.
[c] Density up to 15 units per acre in Specific Plan, 10 units per acre in alternatives.
[d] Density up to 20 units per acre.
[e] Includes some regional commercial.

Source: ELS/Elbasani & Logan; Mundie & Associates.

Flooding and Drainage. In general, this alternative would lead to impacts that would be similar to the proposed plan. This alternative would result in intensified development of a rural environment. Portions of the planning area are within 100-year flood hazard zones, presenting potential hazards to human safety and property. Development of impervious surfaces would increase runoff, increasing flood flows. Impacts on the flow, quality, or availability or groundwater are not expected.

Public Health and Safety. In general, this alternative would lead to impacts that would be similar to the proposed plan. Development allowed under this alternative could result in significant adverse public health and safety impacts on construction workers and to residents/employees.

Public Services. In general, this alternative would lead to demand for public services that would be similar to the proposed plan. The increased number of employees and decrease in residents could effect the mix of calls received by the police department and fire district, but the overall marginal differences between this alternative and other development alternatives are probably very minor. Park usage could increase during mid-day periods when employees are at lunch, but would likely diminish in the evenings and on weekends, when compared with either the proposed plan or the residential emphasis alternative. The number of school age children generated by development in the planning area would be lowest under this alternative. However, a portion of this alternative's new employees would live in within the boundaries of the AUSD.

Infrastructure. In general, this alternative would lead to impacts that would be similar to the proposed plan. The onsite roadway network would be noticeably different, but the facilities for water supply, wastewater collection and treatment, and other utilities would not vary substantially.

Vegetation and Wildlife. Impacts on non-native grassland, agricultural areas, special status plant and animal species, ordinance size trees, and wildlife movement patterns would be essentially the same under this alternative as under the proposed plan. Such impacts would not be considered significant. The site plan would still involve loss of seasonal wetlands, water quality in East Antioch Creek would be expected to decline, and nesting raptors could be disturbed if construction is conducted during the breeding season. These impacts would be considered significant. Mitigation for these impacts would be the same as those identified for the proposed plan.

Cultural Resources. The potential for significant impacts on cultural resources within the planning area would be the same for the employment emphasis alternative as for the proposed plan. The alternative development pattern and intensity would still involve the potential unearthing of subsurface resources throughout the planning area.

Visual Resources. The visual effects of emphasizing land uses for employment over residential (especially low medium residential) would be similar to the proposed plan. In some portions of the planning area, the higher density uses or clustering of buildings could be noticeable, when compared to the proposed plan, with its greater acreage of lower density residential.

II.D ALTERNATIVE 3: REGIONAL RETAIL EMPHASIS

VI.D.1 Project Description

Alternative 3 focuses on capturing the regional retail market potential that would be created by the construction of the State Route 4 Bypass through FUA #2 in combination with planned residential growth in Antioch, Oakley and Brentwood. In this alternative, regional commercial uses would occupy approximately 60 acres of land on the north side of Lone Tree Way, between the State Route 4 Bypass and Empire Road. The land use plan for this alternative is shown in Figure 36.

As no local-serving commercial centers are indicated on the plan map, it is assumed that some neighborhood-oriented uses such as supermarkets and drug stores would be located in the regional center.

Employment uses would be located north of the commercial center on both sides of Sunset Drive and on the west side of the Bypass, similar to Alternative 2. These uses would encompass a total of 202.6 acres, compared to 236.1 acres in Alternative 1 and 122 acres in the Specific Plan.

Alternative 3 would provide for 1,331 housing units at densities ranging from 6 units to 20 units per acre. Most of the units (933) would be built at the lowest density; they would spread throughout most of the western portion of FUA #2. As many as 232 medium density units (10 per acre) would be located along Laurel Road, Lone Tree Way and the new arterial west of the Bypass. An estimated 166 high density units would be clustered on Lone Tree Way immediately west of the Bypass.

Water district and public facilities would be similar to those in Alternative 2, but would occupy slightly less land (10.1 acres for public facilities, compared to 12.3 acres in Alternative 2).

VI.D.2 Impacts

Land Use. The description of Alternative 3 (VI.D.1 and Table 35) summarizes the land uses included in this alternative. When compared to either the existing conditions in the planning area or to the no project alternative, this "regional retail emphasis" would represent a change in future land use that would be substantial. Compared with the proposed specific plan, this alternative would shift future development toward uses in the *employment, regional commercial, medium density residential, medium high density residential and high density residential* categories and away from *low medium density residential, community commercial* and *employment center commercial* categories. Its *public/quasi-public* uses would include a slightly increased acreage for *park* and *open space* uses than the proposed plan. No *school* site would be included.

Transportation. This alternative would generate slightly more PM peak hour and daily vehicle trips than the proposed project. However, these additional trips are not expected to create additional project impacts or require additional mitigation. More vehicle trips would be generated in the AM due to increased employment. However, most of the additional trips would be inbound, where additional capacity is available on regional roadways. Increased traffic volumes would be experienced in the AM peak hour at internal project intersections and roadways adjacent to the employment areas west of the SR 4 Bypass. Additional turn lanes may be required at some intersections to accommodate additional AM peak hour traffic.

A higher proportion of project residents would work at the employment centers, resulting in shorter overall trip lengths.

Air Quality. Air quality impacts of Alternative 3 would not appreciably differ from those of the Specific Plan. Emissions from residential sources would be lower in proportion to the reduction in the number of housing units, total emissions would be higher due to the increased level of nonresidential development.

Noise. Alternative 3 emphasizes a regional retail development. In this Alternative, regional commercial uses and employment uses would be located along State Route 4. From a noise and land use planning standpoint, this Alternative is similar to Alternative 2, and also preferable to the proposed Specific Plan.

Geology, Soils and Seismicity. In general, this alternative would lead to impacts that would be similar to the proposed plan. This alternative would have a significant impact if it resulted in the exposure of people or structures to major geologic hazards, resulted in unstable earth conditions, resulted in a change in topography, increased erosion or siltation. Significant geologic hazards would include geologic and/or seismic conditions that could not be mitigated by implementation of standard engineering design or construction practices, non-compliance with Federal and State safety laws and regulations, and/or local grading/excavation regulations. Potential impacts at the project include unstable slopes, erosion, fill settlement, expansive soils and seismic hazards.

Flooding and Drainage. In general, this alternative would lead to impacts that would be similar to the proposed plan. This alternative would result in intensified development of a rural environment. Portions of the planning area are within 100-year flood hazard zones, presenting potential hazards to human safety and property. Development of impervious surfaces would increase runoff, increasing flood flows. Impacts on the flow, quality, or availability or groundwater are not expected.

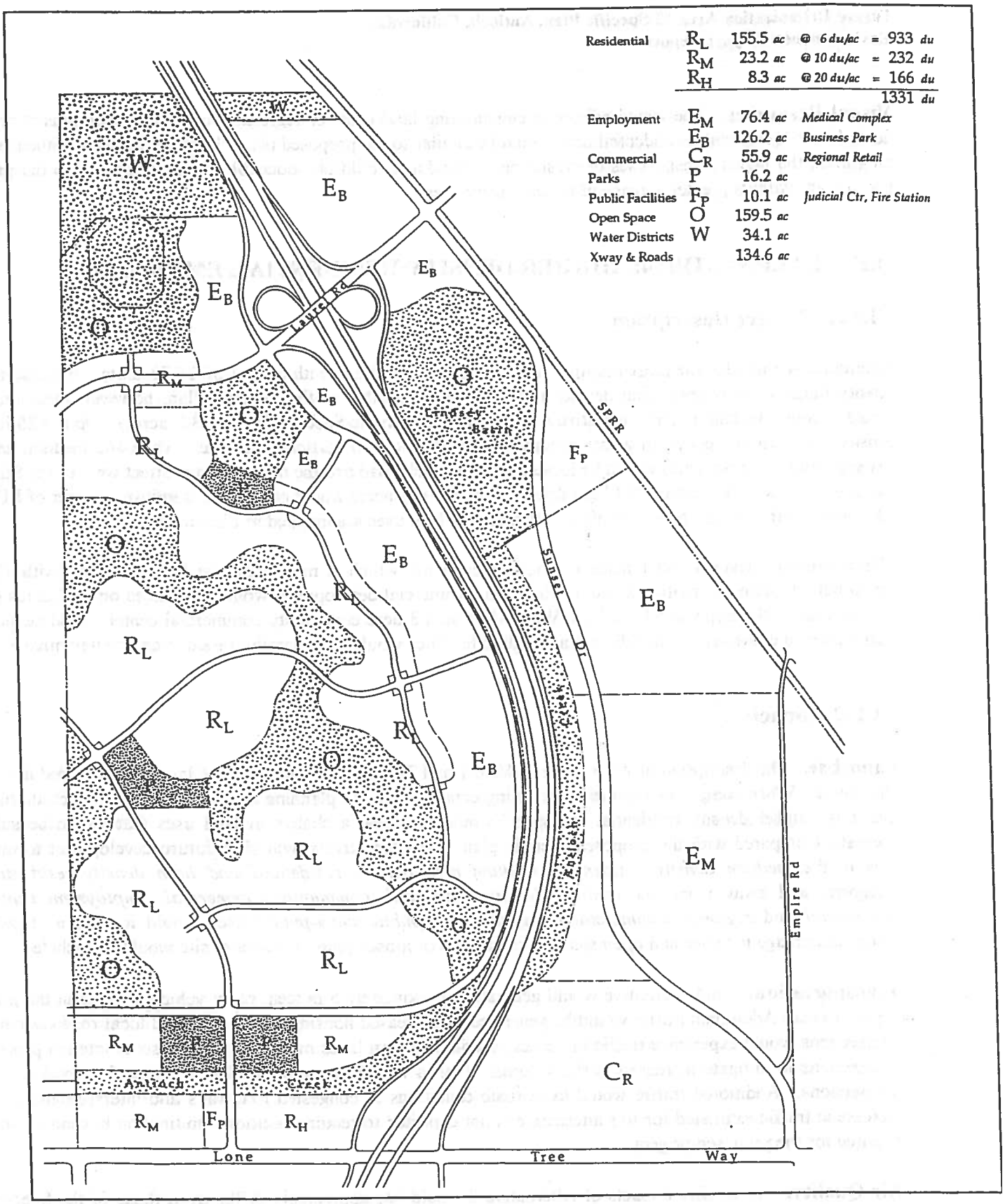
Public Health and Safety. In general, this alternative would lead to impacts that would be similar to the proposed plan. Development allowed under this alternative could result in significant adverse public health and safety impacts on construction workers and to residents/employees.

Public Services. In general, this alternative would lead to demand for public services that would be similar to the employment emphasis alternative. The number of school age children generated by development in the planning area under this alternative would fall in the middle of the three alternatives.

Infrastructure. In general, this alternative would lead to impacts that would be similar to the proposed plan. The onsite roadway network would be most different in the southern portion of the planning area, but the facilities for water supply, wastewater collection and treatment, and other utilities would not vary substantially.

Vegetation and Wildlife. Impacts on non-native grassland, agricultural areas, special status plant and animal species, ordinance size trees, and wildlife movement patterns would be essentially the same as for the proposed plan. Such impacts would not be considered significant. The site plan would still involve loss of seasonal wetlands, water quality in East Antioch Creek would be expected to decline, and nesting raptors could be disturbed if construction is conducted during the breeding season. These impacts would be considered significant. Mitigation for these impacts would be the same as those proposed for the proposed plan.

Cultural Resources. The potential for significant impacts on cultural resources within the planning area would be the same for the regional retail emphasis alternative as for the proposed plan. The alternative development pattern and intensity would still involve the potential unearthing of subsurface resources throughout the planning area.



Source: ELS/Elbasani & Logan

Figure 37

Land Use Plan for Alternative 3: Regional Retail Emphasis

0 500 1000 2000

Antioch Future Urbanization Area #2 EIR

Visual Resources. The visual effects of emphasizing land uses for regional retail and higher density residential over low medium residential uses would be similar to the proposed plan. In some portions of the planning area, the higher density uses or clustering of buildings could be noticeable, when compared to the proposed plan, with its greater acreage of lower density uses.

II.E ALTERNATIVE 4: HIGHER DENSITY RESIDENTIAL EMPHASIS

VI.E.1 Project Description

Alternative 4 provides the most housing units of any of the plans, with a total of 1,552 units. Because the density range for this residential development is higher than that of the Specific Plan, however, these units would occupy less land in this alternative (208.7 acres) than in the Specific Plan (243.7 acres). Up to 926 low density units (up to 6 per acre) would occupy most of the western portion of the area, while 462 medium density units (up to 10 per acre) would be located along Laurel Road and the new collector street west of the State Route 4 Bypass. A cluster of 164 high density units (20 per acre) would occupy the southwest corner of FUA #2, on the north side of Lone Tree Way. Alternative 4 land uses are mapped in Figure 37.

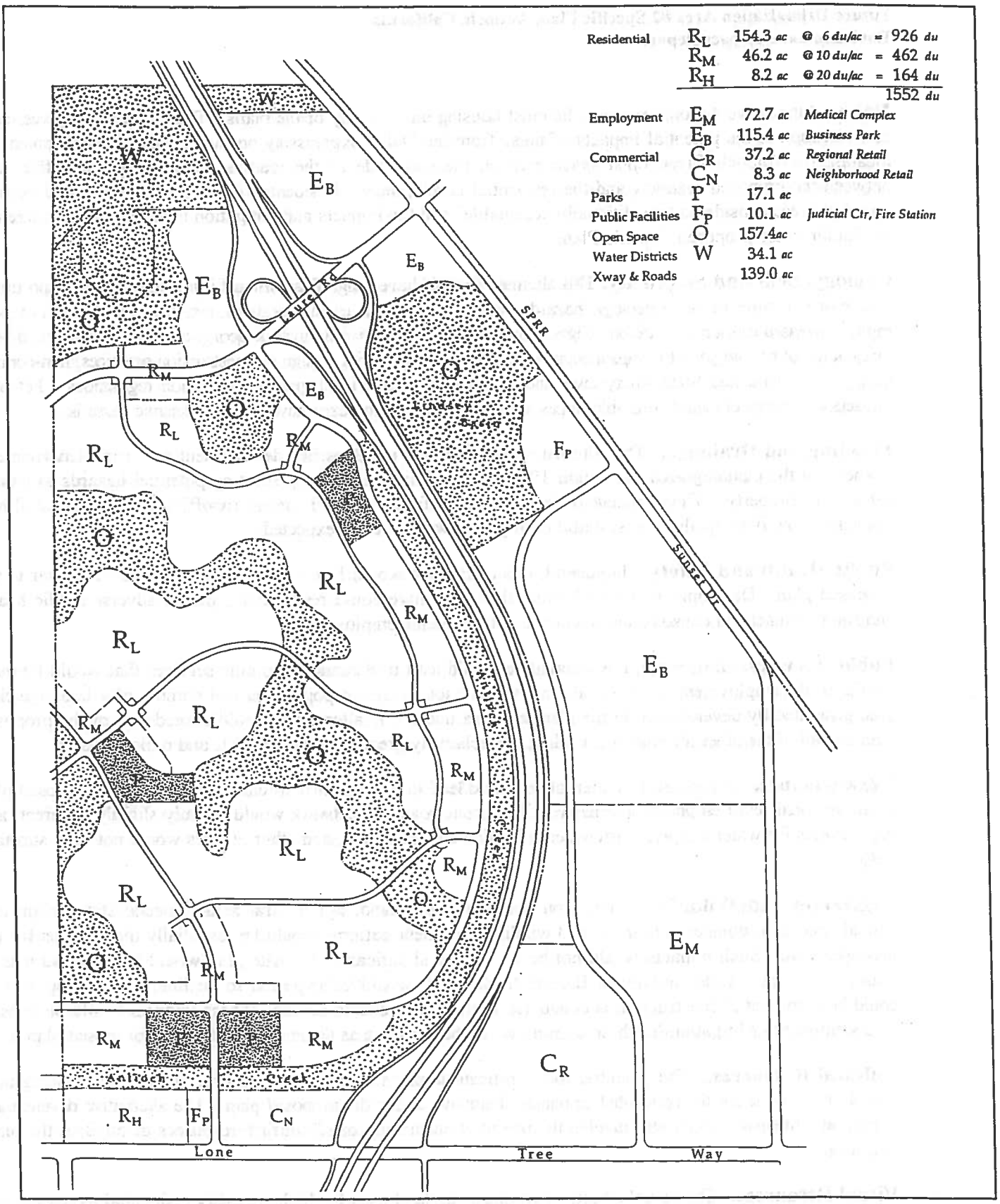
This alternative devotes 188.1 acres to employment uses, which is more than the Specific Plan (with 122 acres) but less than Alternative 2 and 3. Regional commercial development would be located on 37.2 acres on the east side of the Bypass at Lone Tree Way, while an 8.3-acre community commercial center would be situated west of the Bypass. Water district and public facilities would be generally the same as in Alternative 3.

VI.E.2 Impacts

Land Use. The description of Alternative 4 (VI.E.1 and Table 35) summarizes the land uses included in this alternative. When compared to either the existing conditions in the planning area or to the no project alternative, this "higher density residential emphasis" would represent a change in land uses that would be substantial. Compared with the proposed specific plan, this alternative would shift future development toward uses in the *medium density residential, medium high density residential and high density residential* categories and away from *low medium density residential, community commercial, employment center commercial* and *regional commercial* categories. Its *public/quasi-public* uses would include a slightly increased acreage for *park* and *open space* uses than the proposed plan. No *school* site would be included.

Transportation. This alternative would generate approximately 5 percent more vehicle trips than the proposed project. Additional traffic would be generated by increased housing onsite. Internal local roadways and intersections would experience traffic increases. Additional turn lanes may be needed at some internal project intersections to mitigate increased traffic volume. Traffic would increase slightly on regional roadways and intersections. Additional traffic would exacerbate conditions at congested roadways and intersections. The increase in traffic estimated for this alternative is not expected to require additional mitigation beyond what is required for the proposed project.

Air Quality. Air quality impacts of Alternative 4 would not appreciably differ from those of the Specific Plan. Emissions from residential sources would increase in proportion to the higher number of housing units proposed, and total emissions would be higher since this alternative also involves more nonresidential development.



Source: ELS/Elbasani & Logan

Figure 38

0 500 1000 2000

Land Use Plan for Alternative 4: Higher Density Residential Emphasis

Antioch Future Urbanization Area #2 EIR

Noise. Alternative 4 would provide the most housing units of any of the plans. This Alternative gives more consideration to the potential impacts of noise from the Delta Expressway on the residential development by locating the Antioch Creek open space area on the west side of the roadway, increasing the buffer zone between the proposed roadway and the residential development. Residential development would still be proposed in areas considered "conditionally acceptable" and the impacts and mitigation measures would therefore be similar to the proposed Specific Plan.

Geology, Soils and Seismicity. This alternative would have a significant impact if it resulted in the exposure of people or structures to major geologic hazards, resulted in unstable earth conditions, resulted in a change in topography, increased erosion or siltation. Significant geologic hazards would include geologic and/or seismic conditions that could not be mitigated by implementation of standard engineering design or construction practices, non-compliance with Federal and State safety laws and regulations, and/or local grading/excavation regulations. Potential impacts at the project include unstable slopes, erosion, fill settlement, expansive soils and seismic hazards.

Flooding and Drainage. This alternative would result in intensified development of a rural environment. Portions of the planning area are within 100-year flood hazard zones, presenting potential hazards to human safety and property. Development of impervious surfaces would increase runoff, increasing flood flows. Impacts on the flow, quality, or availability or groundwater are not expected.

Public Health and Safety. In general, this alternative would lead to impacts that would be similar to the proposed plan. Development allowed under this alternative could result in significant adverse public health and safety impacts on construction workers and to residents/employees.

Public Services. In general, this alternative would lead to demand for public services that would be most similar to the employment emphasis alternative. The total resident population and number of school age children generated by development in the planning area under this alternative would exceed that of the proposed plan and all of the other alternatives, leading to a relatively greater level of schools and parks impacts.

Infrastructure. In general, this alternative would lead to impacts that would be similar to the proposed plan or the regional retail emphasis alternative. The onsite roadway network would be only slightly different, and the facilities for water supply, wastewater collection and treatment, and other utilities would not vary substantially.

Vegetation and Wildlife. Impacts on non-native grassland, agricultural areas, special status plant and animal species, ordinance size trees, and wildlife movement patterns would be essentially the same as for the proposed plan. Such impacts would not be considered significant. The site plan would still involve loss of seasonal wetlands, water quality in East Antioch Creek would be expected to decline, and nesting raptors could be disturbed if construction is conducted during the breeding season. These impacts would be considered significant. Mitigation for these impacts would be the same as those proposed for the proposed plan.

Cultural Resources. The potential for significant impacts on cultural resources within the planning area would be the same for the residential emphasis alternative as for the proposed plan. The alternative development pattern and intensity would still involve the potential unearthing of subsurface resources throughout the planning area.

Visual Resources. The visual effects of emphasizing land uses for higher density residential uses would be similar to the proposed plan. In some portions of the planning area, the higher density uses or clustering of buildings could be noticeable, when compared to the proposed plan, with its greater acreage of lower density uses.

II.F ALTERNATIVE 5: OFF-SITE ALTERNATIVE

VI.F.1 Project Description

Designating a similarly-sized parcel or assemblage of parcels (of roughly 800 acres) elsewhere in eastern Contra Costa County or nearby counties would be a difficult task. The FUA #2 planning area is currently the subject of the specific planning process because of its locational characteristics and other resources, including its proximity to major roadways and other infrastructure.

VI.F.2 Impacts

If a feasible site could be located elsewhere in eastern Contra Costa County, or in western San Joaquin, southern Solano or southern Sacramento County, the types of impacts identified in Chapter III for the proposed specific plan would almost surely apply. A large-scale site planning and development project on lands not previously urbanized would raise the same general issues wherever development occurred, and the same general categories of mitigations would be needed.

What distinguishes the FUA #2 site from many others is the fact that the development of this site has long been envisioned as part of Antioch's future. The site was included in the city's most recent general plan, and the provision of urban services to the site was addressed in the 1992 Antioch Infrastructure Plan. For most rural sites, no equivalent level of planning preparation has been accomplished.

Furthermore, this site lies on the "urban" side of Contra Costa County's urban limit line, meaning that the appropriateness of urban development is not ruled out. Investments by various non-city public agencies would support or contribute to urban development here: the SR 4 Bypass would lie partially within the specific plan area , the Lindsay detention basin would be expanded and developed in a manner suitable for joint flood control and recreation use; the County of Contra Costa envisions a development project within the FUA #2 area. These are all indicators of readiness to meld these 800 acres into the future fabric of urban Antioch.

Compared with other theoretically-possible sites, this one is almost certainly closer to existing urban development, better served by infrastructure, and more capable of a mixed-used development pattern that would contribute to local and regional planning goals (such as jobs/housing balance). Other sites are likely to be more remote, and as a result would have less favorable land use consequences (more lower density residential development and less potential for intensive employment development); more adverse transportation effects (higher average trip lengths); and greater adverse effects on air quality (less within-community commute potential).

Site-specific impacts (such as on noise and biology and cultural resources) and project-specific impacts (such as on visual resources) cannot be evaluated in the absence of a specific site and plans for a specific project. However, the advantages of the FUA #2 site and specific plan as compared with the disadvantages attendant on sites more remote and less fully integrated into community planning make it unlikely that an alternative site would be found environmentally superior to this one.

VI.G ENVIRONMENTALLY-SUPERIOR ALTERNATIVE

CEQA (§15126(d)(2)) requires that an EIR identify the "environmentally superior alternative" from among those considered, and that, if the "environmentally superior alternative" is the no-project alternative, the EIR shall also identify an environmentally superior alternative from among the other alternatives.

Because Alternative 1 (no project) would not alter the existing environment, it would have the least impact on the physical environment as defined by CEQA. However, the Specific Plan offers environmental benefits to Antioch and the region in providing suitable sites for and accommodating future employment development in a manner that would assist in realizing a greater level of within-community commuting, and reduction in the commute load on the regional roadway network. Since the three development alternatives (Alternatives 2, 3 and 4) to some degree share in the economic development emphasis of the Specific Plan, all three would also contribute to these transportation benefits, but it is likely that Alternative 2 (employment emphasis) would contribute most and Alternative 4 (residential emphasis) would contribute least.

CHAPTER VII

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VII.C BIBLIOGRAPHY

American Ornithologist's Union. Thirty-seventh Supplement to the Checklist of North American Birds. July 1989.

Antioch *Ledger*. "Mines Yielded Richer." Antioch Centennial *Ledger*, Section of Vol. LXXXI, No. 13, July 3, 1951, pages 10 - 12. 1951.

Association of Bay Area Governments (ABAG). Map of *Dam Failure Inundation Areas, San Francisco Bay Region*, March 1980.

_____. Liquefaction Susceptibility, San Francisco Bay Region, map 1:250,000. 1980.

_____. Bay Area Regional Earthquake Preparedness Project, Earthquake Preparedness Checklist for Hospitals. 1986

Baker, Suzanne. Archaeological Reconnaissance of the Horse Valley Estates, Contra Costa County, California (Archaeological Consultants) NWIC #S-6927. 1984.

_____., and Laurence H. Shoup. Archaeological Reconnaissance of the Brentwood Country Club Project, near Brentwood, Contra Costa County, California (Archaeological/Historical Consultants). NWIC #S-11841. 1990.

Ballard, Margaret. History of Coal Mining in the Mount Diablo Region, 1859-1885, Master's Thesis on file at the University of California at Berkeley, California. 1931.

Baumhoff, Martin A. Ecological Determinants of Aboriginal California Populations. *University of California Publications in American Archeology and Ethnology* 49(2):155-236. Berkeley. 1963.

Beck, W.A. and Y.D. Haase. *Historical Atlas of California* (Third Printing). University of Oklahoma Press. Norman. 1974.

Beeler, Madison S. Saclan once more. *International Journal of American Linguistics* 25:67 -68. 1959.

Bennyhoff, James A. The Ethnography of the Plains Miwok. *Center for Archeological Research at Davis. Publication 5.* University of California, Davis. 1977.

Black Diamond Mines Regional Preserve. *100 Years Ago At Black Diamond Mines.* Flyer available at the East Bay Regional Parks District, Black Diamond Mines Regional Preserve. n.d.

Bramlette, Allan G. *An Archaeological Study for the Pusser Parcel near Brentwood Contra Costa County, California.* (Sonoma State University) NWIC #S-6661. 1984

Bramlette, Alan; Mary Praetzellis, Adrian Praetzellis, Katherine M. Dowdall, Patrick Brunmeier and David A. Fredrickson. *Archaeological Resources Inventory for Los Vasqueros Water Conveyance Alignments*, Contra Costa County, California (Sonoma State University) NWIC #S-13256. 1991.

Brown, Lauren, editor. Grasslands. *The Audubon Society Nature Guides*. Alfred A. Knopf, Inc. New York. 1985.

Brown, William M. III. *Historical Setting of the Storm: Perspectives on Population, Development, and Damaging Rainstorms in the San Francisco Bay Region,* in Landslides, Floods, and Marine Effects of the Storm of January 3-5, 1982, in the San Francisco Bay Region, California, Stephen D. Ellen and Gerald F. Wieczorek, Eds., U.S. Geological Survey Professional Paper 1434. 1988.

California, State of. Storm Water Quality Task Force. *California Storm Water Best Management Practice Handbooks: Municipal, Construction Activity and Industrial/Commercial.* March. 1993.

_____. Department of Fish and Game. California Natural Diversity Database (CNDDB). 1994.

_____. Department of Fish and Game. State and Federal Endangered and Threatened Animals of California. Revised April 1990

_____. Department of Fish and Game. Natural Diversity Data Base. Special Animals. April 1990.

_____. Department of Fish and Game. Los Vaqueros - Fish and Wildlife Impacts. 264 pp. 1983.

Chavez, David. *Cultural Resource Evaluation of the Hillcrest Development Location in the City of Antioch,* (Sonoma State University) NWIC #S-1451. 1979.

_____. *Archaeological Resources Evaluation for the Hillcrest Avenue Bridge Reconstruction and Widening Project*, (Sonoma State University), NWIC #S-8178. 1986.

_____. Letter to Kristina A. Schierenbeck of Environmental Science Associates, Inc., re: Parcels "A" and "B", North American Development Corporation, (David Chavez and Associates) NWIC #S-9776. 1988a.

_____. Cultural Resources Investigations for the Contra Costa Water District Treatment Plant Project, Contra Costa County, California (David Chavez and Associates) NWIC #10413. 1988b.

Contra Costa, County of. Flood Control District, *Draft Subsequent Environmental Impact Report, Marsh Creek Watershed Regional Drainage Facility, Sand Creek Improvements*, January 1992.

_____. Contra Costa County General Plan, 1990-2005, Appendix I. 1991.

Contra Costa *Gazette*. Judsonville and Its Mining Development: A Flying Trip to Judsonville. December 28, 1877.

_____. "The Empire Coal Mine", November 24, 1877.

_____. "Work Suspended", Contra Costa Gazette, February 28, 1880.

_____. "The Reported Disturbance in the Coal Mines", March 20, 1880.

_____. "Hazardous Service", March 5, 1881.

Contra Costa Historical Society. Illustrations of Contra Costa Co. California, with Historical Sketch. Smith and Elliott, Oakland. 1952

Cook, Sherburne F. The Epidemic of 1830-1833 in California and Oregon. *University of California Publications in American Archeology and Ethnology* 43(3):303-326. Berkeley. 1955.

Cruikshank, J.T. The Coal and Other Resources of the County East of the Mt. Diablo Meridian, Contra Costa Gazette, July 8, 1876.

Emcon Associates. S & J Investments Company, East Contra Costa Sanitary Landfill, Contra Costa County, California. NWIC #S-7133. 1985.

Farris, Glenn, Kathleen Davis, and John McAleer. The John Marsh Stone House Archeological Project. Unpublished paper Available through the State Parks and Recreation. 1988

Fowler, Douglas N. The Demise of the Black Diamond Coal Mining Community, unpublished manuscript, California State University, Hayward. 1981.

Fredrickson, David. Early Cultures of the North Coast Ranges, California. Ph.D. Dissertation, University of California Davis. 1973.

Gifford, E.W. Miwok Moieties. *University of California Publications in American Archeology and Ethnology* 12(4):139-194. Berkeley. 1916.

Goodyear, W. A. The Coal Mines of the Western Coast of the United States. A.L. Bancroft & Company, San Francisco. 1877.

Grabowicz, Paul "Mines Were Opened in 1855". Oakland Tribune, December 4, 1980.

Grinnell, J. and A. H. Miller. Distribution of the birds of California. Pacific Coast Avifauna No. 27, Cooper Ornithological Society, Berkeley, CA.

Grinnell, J., J. S. Dixon, and J. M Linsdale. Furbearing mammals of California. Vol. 2. Univiversity of California Press, Berkeley, California. 1937.

Harmon, Robert M and Donna m. Garaventa with Angela M. Banet. Cultural Resources Assessment of The Bedford Estates, Subdivision #7090, Oakley, Contra Costa County, California (Basin Research Associates, Inc.) NWIC #S-10770. 1989.

Heizer, Robert F. The Archaeology of Central California I: The Early Horizon. *University of California Anthropology Records*, Volume 12, No.1:1-84. Berkeley. 1954.

H. T. Harvey and Associates. Antioch Infrastructure Plan EIR, Project 668-02. 1992.

_____. Garravanta Parcel San Joaquin Kit Fox Survey, Project 440-02. 1988b.

_____. Kaiser Project, San Joaquin Kit Fox Survey, Project 668-06. 1994

Higgins, Chris T. Underground at Black Diamond Mines. California Geology, vol 42, No. 10, October 1989, Pp. 228-230.

Holman, Miley Paul. Archaeological Field Inspection of the hancock Specific Plan Property, Brentwood, Contra Costa County, California (Holman and Associates), NWIC #S-13813. 1990.

Hoover, Mildred Brook. Historic Sports in California: Counties of the Coast Range. Stanford University Press, Stanford, CA. 1937.

Jensen and Associates. Class III Intensive Archaeological Field Reconnaissance of the Kellogg Reformulation Unit Highline Canal Alternative, Contra Costa and Alameda Counties, California. NWIC #S-10509. 1986.

Jerabek, Harold. "Century-Old Ghosts Roam Contra Costa Coal Mines." Oakland *Tribune*, Feb 22, page 29D. 1957.

Johnson, J.J.(ed.), with C. Assad, G.Greenway, B. Poswall, W. Soule, W. Wiant, K. Wilson, H. Keesling, J. Wood, D. Sumner, and P. Morgan. Archeological Investigations at the Blodgett Site (CA-SAC-267), Sloughhouse Locality, California. Submitted to the National Parks Service, California. 1976.

Jones, P.M. Mound Excavation Near Stockton. *University of California Publications in American Archaeology and Ethnology* 20(7):113-122. Berkeley. 1922.

Jones and Stokes. Los Vaqueros/ Kellogg Project. Jones and Stokes Associates, Inc. 1986.

Kroeber, Alfred. *Handbook of the Indians of California*. Third Edition. California Book Company, Berkeley. 1970.

Levy, Richard. Eastern Miwok. In *Handbook of North American Indians*, Volume 8, California, Robert F. Heizer, Ed., pp. 398-413. Smithsonian Institution. Washington. 1978a.

_____. Costanoan. In *Handbook of North American Indians*, Volume 8, California, Robert F. Heizer, Ed., pp. 485-413. Smithsonian Institution, Washington. 1978b.

Lillard, J.B and W.K. Purves. The Archeology of the Deer Creek - Cosumnes Area, Sacramento County, California. Sacramento Junior College, Department of Anthropology Bulletin 1. Sacramento. 1936.

Lillard, J.B., R.F. Heizer and F. Fenenga. An Introduction to the Archeology of Central California. Sacramento Junior College, Department of Anthropology Bulletin 2. Sacramento. 1939.

Maidment, D.R. *Handbook of Hydrology*. McGraw Hill, Inc. 1993

McGill-Martin-Self. Constraints Map, Lone Tree Valley, Antioch, California. 1 inch equals 400 feet. 1989.

McGrew, J. C. Vulpes macrotis. Mammalian Species No. 123. 6 pp. 1979.

Milliken, Randall T. The Spatial Organization of Human Population on Central California's San Francisco Peninsula at the Spanish Arrival. M.A. Thesis, Sonoma State University. 1983.

Moratto, M. J. *California Archeology*. Academic Press. Orlando. 1984.

Morrell, S. Life history of the San Joaquin kit fox. CDFG, Wildlife Management Branch. 25 pp. 1972.

_____. San Joaquin kit fox distribution and abundance in 1975. Admin. Report 75-3, CDFG, Sacramento, CA 28 pp. 1975.

Mortimer, Alice. Coal Mine "Ghost Towns" of Nortonville, Somersville Recalled by Miner's Daughter, Contra Costa Gazette, February 7, 1959.

Mualchin, L. and Jones, A.L. Peak Acceleration from Maximum Credible Earthquakes in California (Rock and Stiff-Soil Sites). California Division of Mines and Geology Open-File Report 92-1, 53 p. + map. 1992.

Neuenschwander, Neal. Archeological Isolate Record for site Kellogg Unit Isolate #1 (1/86). (Jensen and Associates) NWIC #C-1090. 1986.

O'Farrell, T. P. and P. Mccue. Inventory of the San Joaquin kit fox on BLM lands in western San Joaquin Valley. Final Report ECC 1183-2416, EG&G, Santa Barbara Operation, U.S. Dept. of Energy, Goleta, California. 1981.

O'Farrell, T.P., T. Kato, P. Mccue and M. S. Sauls. Inventory of San Joaquin kit fox on BLM lands in southern and southwestern San Joaquin Valley. Final report, ECC 1183-2400, EG&C, Santa Barbara Operations, U.S. Dept. of Energy. Goleta, California. 1980.

Orloff, S., F. Hall, and L. Spiegel. Distribution and habitat requirements of the San Joaquin kit fox in the northern extreme of their range. Trans. Western Section Wildlife Society. 22:60-70. 1986.

Pape, Janet. An Archaeological Survey of Williamson/Shannon Homestead, Antioch, Contra Costa County, California. NWIC #S-7983. 1986.

Praetzellis, Adrian. National Register of Historic Places Registration Form for Black Diamond Mines Regional Preserve (Sonoma State University), NWIC #S-13591. 1991.

Radin, Rick. "Pittsburg: A Look Back". The Tribune, Oakland CA August 12, 1988.

Rantz, S.E. *Mean Annual Precipitation and Precipitation Depth-Duration-Frequency Data for the San Francisco Bay Region, California*, U.S. Geological Survey, Open File Report 3019-12, October 1971.

Ragir, S.R. The Early Horizon in Central California Prehistory. *Contributions of the University of California Archeological Research Facility* 15. Berkeley. 1972.

Regional Water Quality Control Board, San Francisco Bay Region (RWQCB). *SF Bay Regional Water Quality Control Board Staff Recommendations for New and Redevelopment Controls for Storm Water Programs*, 24 February 1994.

RESNA Industries Inc. *Oxy USA Inc. Brentwood Oil and Gas Field, Antioch, California, Phase II Remedial Investigation/Feasibility Study*, 25 June 1992.

San Francisco *Chronicle.* "Open House at Black Diamond Mines." August 14, 1989. 1989.

Schenck, W. E. and E.J. Dawson. Archeology of the Northern San Joaquin Valley. *University of California Publications in American Archeology and Ethnology* 25(4):289-413. Berkeley. 1929.

Shipley, William. Native Languages of California. In *Handbook of North American Indians*, Volume 8, California, Robert F. Heizer, Ed., pp. 80-90. Smithsonian Institution. Washington. 1978.

Silva, Gary M. "Old Mines Were Boon To County," Sunday, May 11, 1969, page 12-13.

Slocum, W.A & Co. History of Contra Costa County California (Originally published in 1882 by W.A. Slocum & Co., San Francisco). Republished by Brooks-Sterling Company, Oakland, Ca 1974.

Smith, Michael and Suzanne Baker. Archaeological Reconnaissance of the Highway 4 Widening Project Near Oakley, Contra Costa County, California (Archaeological/Historical Consultants), NWIC #S-11385. 1990

Stein, Louis L. Personal Notes of Louis Stein Retained in the Contra Costa Historical Society, Pleasant Hill, CA. n.d.

Stewart, Suzanne B. Cultural Resources Review, East Contra Costa County Sanitary and Landfill Project, South of Antioch, Contra Costa County, California (Sonoma State University) NWIC #S-7803. 1985.

Sullivan, R. and Waters, J. Mount Diablo Coal Field, Contra Costa County, California, California Geology, v. 33, n. 3, pp. 51-59. 1980.

U.S. Government. Department of Agriculture (USDA). Soil Survey of Contra Costa County, California, 122 p. + plates. 1977.

_____. Department of Agriculture. *Soil Survey of Contra Costa County.* 1977.

_____. Federal Emergency Management Agency (FEMA). Flood Insurance Rate Map (FIRM), City of San Jose, Community Panel Number 060025 0335B, 16 July, 1987.

_____. Geological Survey (USGS), *Working Group on California Earthquake Probabilities, Probabilities of Large Earthquakes in the San Francisco Bay Region,* Circular 1053. 1990.

_____. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants. 50 CFR 17.11 &17.12 April 15, 1990.

_____. Department of the Interior, Fish and Wildlife Service and Department of Commerce, National Oceanic and Atmospheric Administration (50 CFR Part 402 Interagency Cooperation-Endangered Species Act of 1973, as Amended; Final Rule.

Veale, R.R. Letter with Short History of New York Landing, Nortonville, Pittsburg Landing, Somersville and Empire. On file at Contra Costa County Historical Society, Pleasant Hill. 1933.

Voigt, Randall. A Somersville Artifact Distribution Pattern: The 1980 Test Strip and the Town Plan. A Senior Honors Thesis, University of California at Berkeley, California. 1982.

Wallace, W.J. Northern Valley Yokuts. In *Handbook of North American Indians*, Volume 8, California, Robert F. Heizer, Ed., pp. 462-470. Smithsonian Institution. Washington. 1978.

Wesnousky, S.G. *Earthquakes, Quaternary Faults and Seismic Hazards in California.* Journal of Geophysical Research, V.91, N. B12. 1985.

Wills, C.J. The Elusive Antioch Fault, in Proceedings of the Second Conference on Earthquake Hazards in the Eastern San Francisco Bay Area. California Division of Mines and Geology, Special Publication 113, pp. 325-331. 1992.

Wong, I.G., Ely, R.W., and Kollmann, A.C. Contemporary Seismicity and Tectonics of the Northern and Central Coast Ranges-Sierran Block Boundary Zone, California. Journal of Geophysical Research, v. 93, pp. 7813-7833. 1988.

DEIR Errata

This DEIR has been prepared over a period of more than a year, completing a program of research and analysis during the period of time the Specific Plan has taken shape and has been subject to a series of staff and public reviews.

Some of the maps prepared for this DEIR have utilized as their base map a version of the base map for the Specific Plan that was superseded by a more recent base map.

For this reason, some of the mapped information in this document is presented on background base maps that are no longer current. Figures 27 and 28 reflect this situation.

CHAPTER VIII

APPENDICES

This chapter includes sources of information used for technical support during the production of this document. These sources include the following:

APPENDIX A Notice of Preparation

APPENDIX B Memorandum to Members of the Planning Commission: Study Session on FUA #2 (11/29/94)

APPENDIX C Description of the East Contra Costa County Travel Model

APPENDIX D Fundamentals of Acoustics

Appendix E, the Vegetation and Wildlife Technical Background Report, is available for public review at the City of Antioch Development Services Department.

APPENDIX A

NOTICE OF PREPARATION

TO:

FROM: City of Antioch
LEAD AGENCY
P.O. Box 130
Antioch, CA 94509

DIRECT RESPONSE TO: Mundie & Associates
ENVIRONMENTAL COORDINATOR
3452 Sacramento Street
San Francisco, CA 94118

DATE: November 3, 1993

SUBJECT: Notice of Preparation (NOP) of a Draft Environmental Impact Report (EIR)

The City of Antioch will be the Lead Agency for the preparation of an EIR for the project identified below.

This EIR follows the preparation and certification of a Draft and Final EIR (in June 1992 and August 1992, respectively) for the *Antioch Infrastructure Plan* (State Clearinghouse #91123021). That EIR addressed the potential impacts of a plan for providing major infrastructure to two future urbanization areas. The preparation of the Specific Plan and EIR represents the next tier in the planning and environmental review process.

This NOP solicits responses which will assist in determining the scope and depth of project-level environmental analysis. If yours is a public agency with statutory responsibilities in connection with the proposed project, your agency will need to use this EIR when considering your permit or other approval for the project.

A location map and project description are attached. An Environmental Checklist is not attached.

Due to the time limits mandated by State law, we ask that you respond at the earliest possible time, **but not later than 30 days** after receipt of this notice. Please send your response to Roberta Mundie, Environmental Coordinator, at the address shown above. We will need the name of a contact person in your agency or organization.

Project Title: Specific Plan for Future Urbanization Area (FUA) #2

Project Applicant: Landowners and/or potential developers of property

Project Description: See attachments.

Signature: *Roberta M. Mundie*
Roberta M. Mundie

Title: Environmental Coordinator
Telephone: (415) 441-9640
FAX: (415) 441-9683

PROJECT LOCATION

The study area is located on the eastern edge of the City of Antioch, and is bounded on the west by the developing Antioch Southeast Area, on the south by Lone Tree Way, on the east by Empire Avenue and Neroly Road, and on the north by the Contra Costa Canal.[1] The study area is a single contiguous tract of approximately 800 acres, designated in the General Plan as FUA #2. Part of the area was annexed to Antioch in September 1993; annexation of the balance will be proposed to LAFCo within the coming months.

Figure 1 shows the study area in its regional setting, and Figure 2 indicates the locations of FUAs #1[2] and #2.

BACKGROUND

Antioch General Plan

The 1988 Antioch *General Plan* update contains policy direction for the project area and designates the Specific Plan area for eventual urban uses. Development in this area is intended to serve as a major employment center with most of the land to be set aside for future suburban business parks incorporating major offices and light industrial uses. The *General Plan* does not provide land use designations for the FUA, but defers that process to the Specific Plan.

Antioch Infrastructure Plan

Antioch has completed extensive planning and engineering work relating to FUA #2. That previous work culminated in the preparation of the *Antioch Infrastructure Plan* and its associated *Draft* and *Final EIR*s in 1992. The following documents relate to the earlier work:

- Draft and Final EIR, 1992 (Mundie & Associates)
- Opportunities and Constraints Report, 1991 (Mundie & Associates)
- FUA #2 Service Area Plan, 1992 (McGill·Martin·Self)
- Antioch Infrastructure Plan Fiscal Considerations, 1992 (Mundie & Associates)

The 1992 *Infrastructure Plan* EIR analyzed potential development in FUA #2 through the use of three alternative development scenarios which ranged widely in terms of their types and levels of development (the land acreage for commercial and employment uses ranged from 227 to 313 acres and the number of dwelling units ranged from a low of approximately 1,300 to a high of over 2,600). The EIR recommended mitigation measures to address environmental impacts of development in FUA #2, some of which were procedural mitigations or requirements for additional studies to be undertaken at the time of Specific Plan preparation.

This Specific Plan EIR then, represents the third tier of the envisioned planning and environmental review process and will be undertaken both to complete some of those earlier studies and to more completely review the environmental impacts that can be expected given the types, magnitude and location of development envisioned by the Specific Plan.

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[1] FUA #2 occupies approximately the west 1/2 and southeast 1/4 of Section 34, T2N, R2E and the north 1/2 of Section 3, T1N, R2E (Mount Diablo Meridian).

[2] FUA #1 is also the subject of a Specific Plan and EIR process. A Notice of Preparation will be distributed separately.

DESCRIPTION OF PROJECT

Planning Process

The process of preparing and adopting the Specific Plan will draw upon all of the planning and environmental analysis for FUA #2 that has been undertaken as part of the City's *General Plan* and the *Infrastructure Plan* for the FUA (described above). Based on the earlier work, on updated information and on detailed site analysis, the Specific Plan consultant will formulate three alternative development scenarios. The alternative scenarios will be presented to landowners from the area and the City Council. After review and discussion, a preferred concept will be selected and the Specific Plan prepared on that basis.

The EIR on the Specific Plan would analyze the three plan alternatives at an equal level of detail. A separate Fiscal and Financial Analysis would be undertaken for the Specific Plan.

Early in the planning process, Kaiser Permanente may select a site within this FUA and propose a specific development project (preliminarily described in greater detail below). If a site in this FUA is selected, the analysis provided in this EIR would address a land use plan consistent with the type of project Kaiser proposes (see p. 4).

Specific Plan Content

The Specific Plan will be the key planning document for FUA #2 and will set forth a vision for the area in terms of land uses, urban design objectives and criteria, infrastructure and public facilities needed to serve new development, open space and landscaping concepts. A critical element of the plan will be its implementation program that will outline the development approval process, project phasing and financing arrangements for both capital and operating costs. The Plan will be the subject of a fiscal and financing study to be published separately.

Land Use. The predominant land use for FUA #2 will be employment, followed by residential (with potential densities ranging from moderate density single-family homes to high density multi-family units). Open space (in the form of both ridge lands and a creek corridor) will also be designated. Lands immediately adjacent to Lone Tree Way may also be designated for local-serving commercial/retail uses.

Urban Design. The plan will recommend urban design objectives and design guidelines by land use type. Criteria for the evaluation of new development will be set forth and illustrated in the Plan.

Infrastructure and Circulation. Major infrastructure needs (roadways and intersections, water supply, wastewater disposal and treatment, and stormwater runoff) were addressed in the earlier *Infrastructure Plan* and its associated EIR. The Specific Plan will refine plans for those systems on the basis of the plan's land use designations and their spatial layout. The Plan will also address several additional infrastructure categories such as lighting, energy and other utilities.

Public Facilities. The plan will consider the need for and may include the designation of sites for public uses.

Open Space and Landscaping. The open space and landscaping element would address a variety of issues that are very important to future development in FUA #2. Key issues include treatment of the ridge and minor peaks, hillsides, and the proposed water facilities (East Antioch Creek and the Lindsey Detention Basin). Similarly, landscaping schemes for private projects within the FUA will be considered and recommendations made with an eye toward achieving city objectives. Provision of public open spaces as well as the management of reserved open space lands along hillsides, ridgelines and the creek would be part of the Plan.

Implementation. The implementation program will include a phasing plan depicting how development and infrastructure will occur and how capital and operating costs will be financed.

Potential Kaiser Project

This project would be constructed on a site of up to approximately 75 acres and would include a medical office facility and associated commercial, office and retail uses. The project would involve an initial phase in which a medical office building (of approximately 75,000 square feet), surface parking and landscaping would be developed. The timing and composition of future phases would be based on the demand for medical care and the needs of Kaiser members in Antioch and surrounding East Contra Costa County communities. Full buildout of the site could involve up to 950,000 square feet of built space, including a hospital of approximately 300 beds.

ACTIONS AND APPROVALS REQUIRED

The project addressed by CEQA review at this time is a Specific Plan. Actual development of infrastructure and of other urban uses would have to be preceded by the following actions:

- ☐ Certification of a Final EIR on the Specific Plan;
- ☐ Completion of detailed surveys for jurisdictional wetlands;
- ☐ Adoption of Specific Plan;
- ☐ Amendment of Antioch *General Plan* (if needed);
- ☐ Construction of capital improvements to serve planned FUA development in conformance with the Specific Plans;
- ☐ Possible establishment of public financing districts and development fee programs to finance said construction;
- ☐ Other City land use approvals and development permits consistent with the Specific Plans;
- ☐ Possible general or individual permit(s) from U.S. Army Corps of Engineers for activities involving dredging or fill within waters of the U.S.; and
- ☐ Streambed alteration permit(s) from the California Department of Fish and Game.

APPENDIX B

MEMORANDUM

#3
12/7/94

TO: Members of the Planning Commission

FROM: Victor Carniglia, Deputy Director Community Development

DATE: November 29, 1994

SUBJECT: STUDY SESSION ON FUTURE URBANIZATION AREA #2 (FUA #2)

INTRODUCTION

As the Planning Commission is aware, Specific Plans are currently underway for Future Urbanization Areas #1 and #2. In August of this year a Study Session was held on FUA #1. The purpose of this meeting is to conduct a similar exercise with FUA #2.

Attached is a copy of the agenda for this item. The issues identified and the format resembles in many respects those raised with FUA #1. However, while some of the issues may be similar, the physical setting of FUA #2, City policy direction for the area, and development constraints are substantially different than FUA #1. These are discussed in detail in the staff report.

BACKGROUND

The following is a brief chronology of City actions in relation to FUA #2.

- 1981: Southeast Specific Plan: FUA #2 was actually included as a part of the Southeast Specific Plan as Planning Subarea III. However, the Plan did not give it any land use other than classifying it as interim agricultural. The Plan did show road connections and had policies concerning having employment uses in the area.

- 1988 General Plan: The new General Plan designated the area as FUA #2 and included a number of policies concerning the area's future development. Attached is a copy of the "Policy Paper" document summarizing the relevant General Plan policies.

- 1992 Infrastructure Plan: An infrastructure plan was prepared to document that City services could be provided to both FUA #1 and #2 under a range of development scenarios. Three different scenarios were looked at with varying amounts of acreage devoted to employment uses and residential yields from

1326 to 2607 units. These scenarios are described in detail in the Infrastructure Plan EIR that was previously distributed to you.

- September, 1993: Based on the documentation contained in the Infrastructure Plan EIR, approximately 270 acres of FUA #2 was annexed to the City. The entire area was not annexed at this time due to complications with the tax transfer agreement we have with the County.

- November 1993: The Specific Plan was formally initiated with the work funded by property owners.

- September, 1994: Annexation agreements were approved by the City Council.

- October, 1994: LAFCO approved the annexation of the balance of FUA #2 to the City of Antioch. A public hearing will be held in January, 1995 to formally bring this area into the City.

PLANNING OVERVIEW

A good place to start when discussing the planning for FUA #2 is the opportunities and constraints, both man made and natural, that affect planning in FUA #2. It is instructive to note that this is much different than the situation in FUA #1, which is a virtual "blank slate" from a planning perspective. The following are some of the "givens" that have to be worked with and around in FUA #2.

Highway 4 Bypass (Delta Expressway):

This is the single most important component of FUA #2 and substantially affects both land use and circulation in the area. The location of the roadway as depicted on the enclosed Land Use Plan represents the road's precise alignment. This alignment is for all intents and purposes fixed due to the engineering constraints imposed by needing to make connections both north and south of FUA #2. The road right-of-way is substantial, with a cross section of 250 feet. This is to handle up to eight lanes of travel with the future possibility of light rail. There are two interchanges located at Laurel and Lone Tree. These interchanges take up a significant amount of real estate, particularly the Lone Tree Interchange. The roadway is tucked up next to the hills, and in a number of areas would result in significant grading to the hills' eastern slopes. Construction of the Bypass will be

partially funded by the recently adopted Regional Traffic Fee. Initially the road would consist of two to four lanes with at grade crossings at Laurel and Lone Tree. The interchanges will follow when funding allows. Timing of construction is uncertain but would likely commence within the next three to five years.

The Bypass effectively bisects FUA #2 creating two separate planning subareas. Aside from the Bypass there are other infrastructure components that reinforce this split as noted below.

Contra Costa Water District Pipeline: The Water District plans to run a major water pipeline from the new Los Vaqueros Reservoir to the canal and pumping station located in the northwesterly portion of FUA #2. The pipeline easement would be approximately 85 feet wide and would parallel the Highway 4 Bypass on its east side. This easement is shown on the attached Land Use Plan. While structures could not be built on this easement parking would be allowed on it.

Flood Control Channel: There is currently a Flood Control channel running through FUA #2 to a detention basin (known as the Lindsey Basin) in the northeast corner of the site. This is part of the East Antioch Creek system that drains the majority of Southeast Antioch. The existing drainage channel is temporary and will be relocated and widened when the area develops. The existing five acre detention basin is the first phase of a larger basin of approximately 30 acres. In its ultimate configuration the channel will parallel Lone Tree Way, cross under the Highway 4 Bypass, and run north "sandwiched" between the Bypass and the CCWD pipeline.

The channel cross section is approximately 140 to 180 feet wide. This is significantly wider than the upstream portion of the channel located in the Southeast Area, which has a width of approximately 110 feet as it flows through the Seeno Meadow Creek property. This additional width will allow for more vegetation and a more "natural" looking creek. Bicycle/pedestrian paths will be incorporated along the channel. The detention basin will provide opportunities for active recreation areas. The question of recreation facilities is discussed later in this report.

Taken together the three major rights-of-way (Highway 4 Bypass, CCWD pipeline, Flood Control channel) create a swath over 500 feet wide that cuts FUA #2 in half.

Hills: The other significant opportunity/constraint affecting planning in FUA #2 are the hills located in the western portion of

FUA #2. As previously mentioned, the Highway 4 Bypass "hugs" the base of these hills resulting in a situation where the land on the west side of the Bypass is predominantly hilly, while the land to the east is largely flat. Employment-based uses (office, light industrial, etc.) typically develop in flatter areas given their site constraints while residential uses are more flexible and can develop where there is some topography. This, when combined with the fact that residential development exists on the west boundary of FUA #2, tends to create a situation where residential uses "want" to go west of the Bypass and employment-based uses on the east side of the Bypass.

LAND USE PLAN

Staff over the last several months has been working with property owners to prepare a conceptual Land Use Plan for the area. Enclosed is a copy of that Plan. To a large extent the Plan "fell out" of the issues just discussed in relation to the "givens" in FUA #2. The Plan is also based on the following broad concepts which are derived from relevant General Plan policies:

- Employment-based uses would be east of the Bypass and residential uses predominantly west of the Bypass.

- That the possibility to capture retail uses be maximized given the opportunity created by the presence of the Bypass and major arterials.

- That the residential development be seen as an extension of the Southeast Area (it is part of the Southeast Plan), but with better neighborhood definition.

- That there be enough development in the Plan so that it "pencils out" given infrastructure costs.

- That the hills be utilized to create more distinct neighborhoods and provide a visual and open space amenity.

- That the amount of usable employment-based land be maximized with sites sized and configured to attract desirable tenants.

However, the Plan could clearly change depending on how you emphasized or de-emphasized any of these factors. The primary purpose of the Study Session is to get some direction from the Planning Commission on the concepts underlying the Plan and specific comments on the components of the Plan itself. Staff does

not expect the Planning Commission to "bless" the Plan as is without changes or comment. However, it is a good place to start as staff feels the Plan presented represents a reasonable balance of the issues just discussed.

The following is a discussion of the various components of the Plan.

Employment Uses: At this point in time this is a generic term with the intention that it allow office, light industrial, and similar uses. The Plan contains 122 acres of such uses, all of it located east of the Bypass. A key feature to note is the presence of Sunset Drive which divides this area up into buildable sized parcels. Without such a road the parcel configuration would be unwieldy for most users. At buildout given typical site utilization the City could expect over two million square feet of office/light industrial development in this area with approximately 6000 employees.

Regional Commercial: The presence of the Highway 4 Bypass and the projected residential development in Brentwood, Oakley, as well as in Antioch creates the possibility of capturing regional commercial uses. The Plan shows 60 acres of this type of use at the intersection of the Highway 4 Bypass and Lone Tree. The sites are configured to work with "big box" retail but could accommodate a shopping center. This amount of acreage could deliver over one-half million square feet of retail.

Community Commercial: There are three possible Community commercial sites totaling about 40 acres located off of the Lone Tree and Laurel interchanges. These would be less regional in scope and geared toward more traditional shopping center type uses (grocery, drug, restaurant, etc.). It's likely from a market standpoint that the area would only support one or two such centers, and the Specific Plan will need to incorporate a requirement of a market analysis for these properties to develop.

Residential: The plan would allow up to 1322 residential units. Three density ranges are proposed, RL (up to four units/acre), RM (up to six units/acre), and RH (up to 15 acres/acre). These densities are similar to those in the Southeast Area. The attached maps show densities for properties with residential designations, and for adjacent properties currently being developed in the Southeast Area.

In terms of product type the RL designation would deliver 6000 square foot minimum lots while the RM would result in primarily 4500 to 5000 square foot lots. RH would be apartments or similar development.

Public Facilities

Schools: The School District has indicated that they would need an elementary school site within FUA #2. A ten acre site is shown south of Laurel Road. This location was selected as it provides appropriate separation from the Meadow Creek School site and is easily accessible. One complication in relation to school facility planning for FUA #2 is that roughly half of the area lies in the Brentwood School District. There have been discussions between the school districts on this jurisdictional question, but so far no resolution. The Antioch Unified School District is also currently in the process of updating its projected needs for FUA #1 and FUA #2.

Fire Station: A three acre Fire Station site is shown in the southwest corner of FUA #2. This is an ideal site for such a facility as it would have direct access to a signalized intersection on an arterial, and would be separated from surrounding properties by the Flood Control channel, roadways, and a PG&E easement. However, since the Fire District consolidation there is some uncertainty as to whether they want this site. This should be resolved within the next month.

County Land: Next to the Lindsey Flood Control basin is a roughly 11 acre site designated for public facilities (it has an Fp designation). This is land owned by the County, and County staff has indicated that new court and judicial facilities would be developed to serve East County.

Open Space

A key component of any plan is how it treats open space. As previously mentioned there are some substantial hill forms that need to be preserved. The East Antioch Creek and Lindsey Detention Basin provide an open space opportunity. The location and distribution of parks is also a key component to any plan. Attachment 3 provides a graphic overview of the open space components for FUA #2. These aspects are discussed separately below:

Hills: There is a ridgeline of hills located west of the Bypass that runs in a generally north/south direction. The most prominent of these hills range from 200 to 250 feet above sea level, and are a full 100 to 150 feet higher than the surrounding areas. The Plan proposes to preserve this prominent ridgeline and incorporate a trail system linking up these open space areas. This has the following benefits:

- Preserves the dominant ridgeline.
- Provides a visual and physical separation between neighborhoods, thereby reinforcing neighborhood identity.
- Allows for a trail system that ties FUA #2 together, linking parks, schools, and neighborhoods. This trail also will link to the Antioch Creek Trail which connects the Prewett Community Park in Southeast Antioch.

It should be noted that while this concept preserves the highest hills and ridges, it does involve some substantial grading of lower land forms. A graphic will be presented at the meeting to give the Planning Commission a general feeling for the grading that would be involved with this plan.

Antioch Creek and Detention Basin: The creek area will be improved in accordance with the City's Creek Policy, which primarily involves planting the channel with riparian vegetation and the installation of a trail system. As already mentioned, the creek trail will hook up with the existing creek trail system to the west. The channel cross section will be wider through FUA #2 to allow for more vegetation than exists to the west. The Lindsey Detention Basin could accommodate active recreational opportunities such as baseball and soccer fields. This is similar to the approach planned for the detention basin in FUA #1, although the Lindsey Basin at 30 acres is roughly half the size of the 50-60 acre FUA #1 facility.

Parks: The City's park code requires five acres of parks per 1000 population. Based on the number of units allowed by the proposed plan, 1322 units would generate the need for 20 acres of parkland. The plan as presented shows the following park facilities:

- A seven-acre park located at the southerly end of the open space spine. This location allows easy access to the East Antioch Creek Trail system. This location also provides approximate separation (¼ mile) from the nearby Meadow Creek Park. The location of this park is approximate and could

shift slightly to allow a more "equitable" distribution between properties.

- A small 1-2 acre mini park adjacent to the elementary school site. Leisure Services staff is hesitant about this site given its small size and would either like to see the park enlarged or be deleted.

- As already stated, the 30 acre Lindsey Basin could be utilized for active recreation facilities such as soccer and baseball. The land would be owned by the Flood Control District and improved by the City through park-in-lieu fees. While there are maintenance complications with a joint use flood control/ park facility, Leisure Services staff are generally supportive of the concept.

It should be noted that some property owners feel that FUA #2's park needs can be adequately met by the nearby, recently constructed Meadow Creek Park, the proposed small park adjacent to the elementary school, and the Lindsey Basin without having to build the seven-acre park shown on the plan. This is a policy issue that revolves primarily around how much emphasis from a park perspective the City wishes to place on the Lindsey Basin.

Highway 4 Bypass Buffer: The plan depicts an open space area between the Highway 4 Bypass and the proposed collector road that parallels the west side of the Bypass. This is primarily a downslope created by the construction of the Bypass. The treatment of this area from a design and landscape standpoint will be important given its high visibility from the Bypass. Sound attenuation for the residential units to the west will also need to be addressed in this area.

INFRASTRUCTURE

Aside from land use, the other key component of a plan is the infrastructure system. Part of this system has already been described in the overview of the Land Use Plan. The following is a brief summary of the key infrastructure components of FUA #2.

Roadways: The Highway 4 Bypass is the dominant roadway improvement and has previously been described . Lone Tree Way will be widened to six lanes west of the Bypass and four lanes east of the Bypass. Laurel Road will be extended to a four lane arterial and will connect over the railroad tracks to Laurel Road in Oakley. The

1992 Infrastructure Plan EIR provides an estimate of projected traffic volumes on these roadways.

The collector roads (Country Hills Drive, Vista Grande Drive, Canada Valley Road) currently "stubbing out" at the west boundary of FUA #2 will be extended. A new collector road paralleling the west side of the Bypass is also proposed to facilitate north/south traffic flow. Engineering is concerned about the intersection spacing this creates. A map is attached showing how the alignment of the Country Hills extension could be modified to correct this problem. As previously mentioned, a collector named Sunset Drive would be built on the east side of the Bypass to provide access to the employment parcels. This road would ultimately be extended to Sunset Drive on Hillcrest Avenue. The radius of Sunset will need to be tightened slightly in the proximity of the Lindsey Basin to accommodate Flood Control concerns. Empire Road would likely remain in its current configuration.

Drainage: Storm water would be handled with the East Antioch Creek improvements already discussed.

Sewer: A major trunk sewer line serving the Southeast Area is proposed to run through FUA #2. This line will run down Lone Tree Way, up Empire, and then head north paralleling the west side of the railroad tracks. This line is being sized to handle FUA #2 development, and will likely be under construction in 1996.

Infrastructure Costs and Financing: As discussed in the FUA #1 Study Session there is not a linear relationship between the cost of an infrastructure system and the amount of development it is designed to serve. The major expense is sticking the pipe in the ground or building the road in the first place, and not upgrading from one size to another. It therefore takes a certain amount of development to create a viable infrastructure system where the per unit costs are reasonable. In FUA #2 this situation is complicated by the fact that a significant amount of the developable acreage (about 45 percent) is devoted to employment and/or retail uses. While the City would like to see these areas develop as soon as possible, historically they tend to lag behind residential development. Given this it is not practical or fair for the City to require these employment/retail properties to bear significant "up front" infrastructure expenditures through assessment districts or other means. As you may recall, this is the problem the City is currently facing with the Zimmerman church property in Southeast Antioch. Additionally, the Annexation Agreement with the owners of these properties specifically prohibits such an imposition.

The result of all of this is that there needs to be enough residential development to get the infrastructure system off the ground initially. Additionally, the residential development needs to "jump start" the infrastructure in the employment areas, primarily through the construction of Sunset Drive. The intention is to also use some funding from FUA #1 to help accomplish this. The end result is a delicate balancing act between the amount of residential development allowed, infrastructure costs, and the desire to see the employment and retail uses develop as soon as possible without unduly burdening them. The preliminary infrastructure cost figures show that the Land Use Plan roughly achieves this balance. More information will be presented at the meeting on this issue.

RECOMMENDATION

Staff recommends that the Planning Commission review the enclosed material and provide comments to staff at the Study Session.

VC:sjs

Enclosures

cc: D. Rowlands
L. Fadda
R. Mundie, Mundie & Associates
Kerry O'Banion, ELS
Mike McGill, McGill Martin Self

FUA 2

AGENDA

Planning Commission Study Session
December 7 1994

Introduction & Background

- Work to date on FUA 2
- Objectives of commission study session

Site & Land Use Context

- Natural features
- Existing land use
- Planned public projects

Objectives for FUA 2

- General plan context
- Employment center
  - Goals
  - Strategies
- Residential villages
  - Goals
  - Strategies

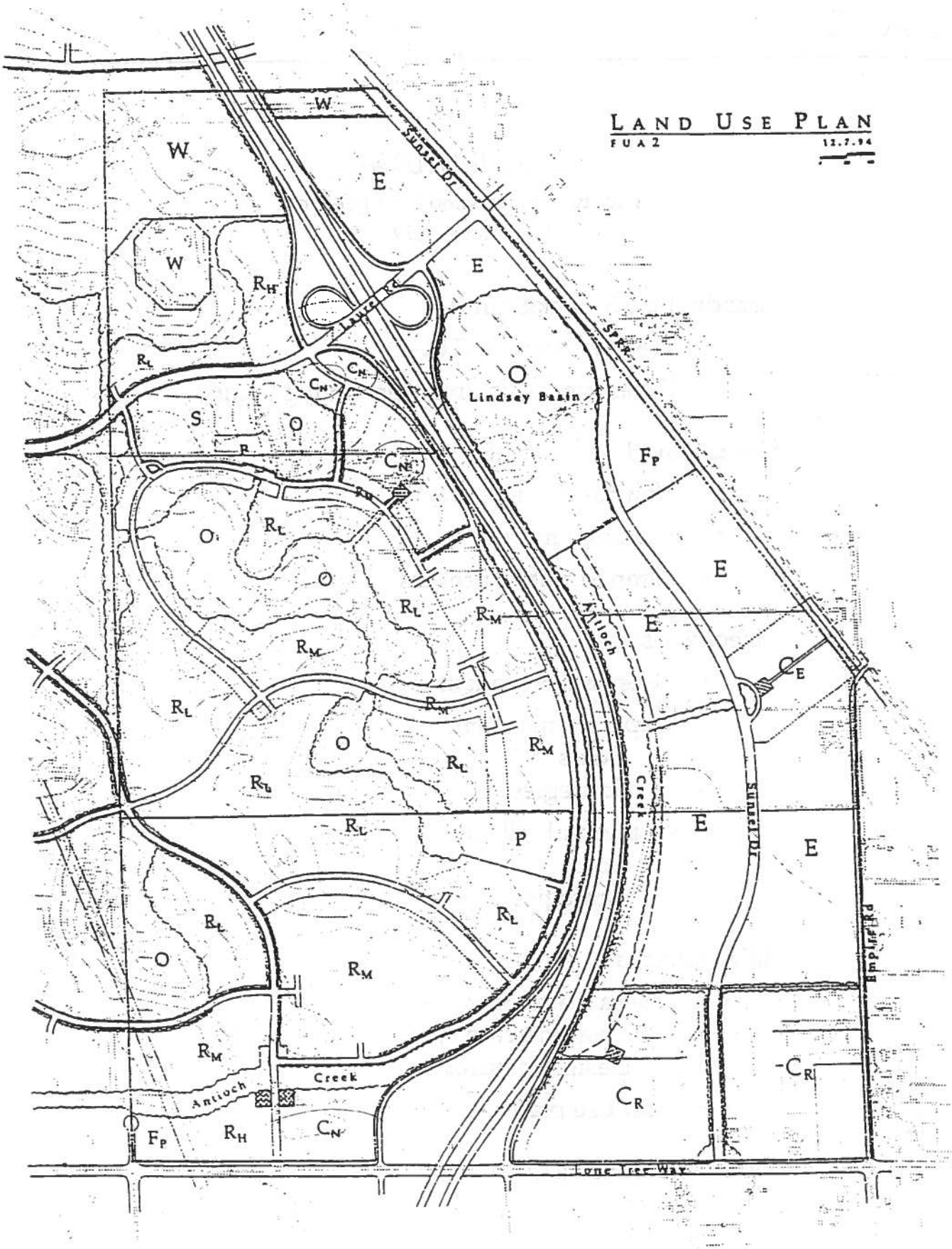
Plan Concepts

- Design framework
  - Open space system
  - Design features
- Land use plan

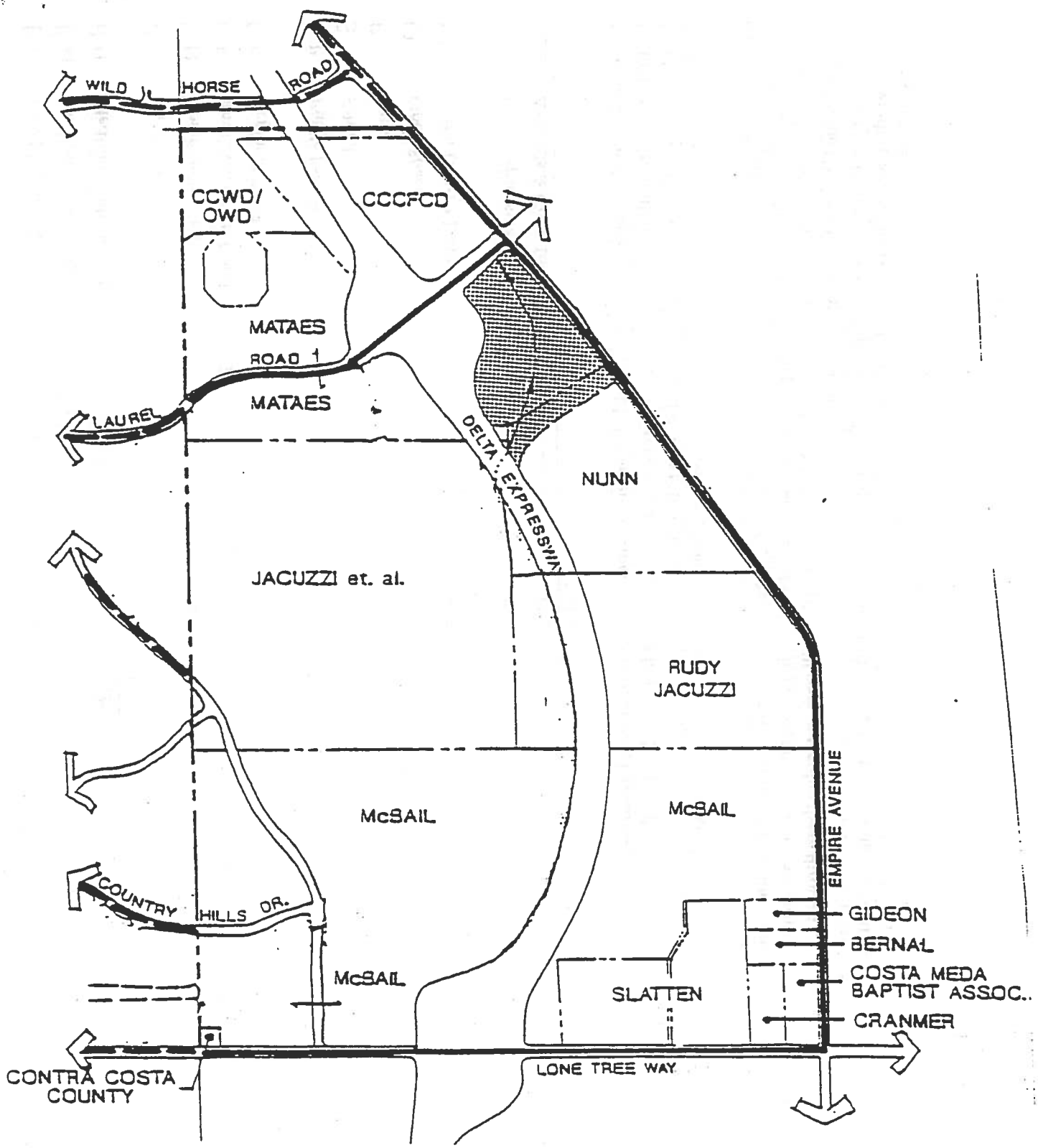
Commission Discussion

Next Steps

AGENDA FOR STUDY SESSION



FUA #2 LAND USE PLAN



FU#2 PROPERTY OWNERSHIP

Land Use Summary

			Ac	Units
R L	Low Medium Density Res	4 u/acre	137.4	550
R M	Medium Density Res	6 u/acre	91.3	548
R H	Medium High Density Res	15 u/acre	15.0	225
				1322
E	Employment		122.0	
C N	Community Coml		24.2	
C E	Employment Ctr Coml	1	11.4	
C R	Regional Coml		60.9	
F P	Public Facility	2	10.8	
S	School	3	11.3	
P	Park		9.4	
O	Open Space	4	130.0	
W	Water District Land		34.5	
	Delta Expressway		83.0	
	Arterials & Collectors		43.3	
			784.5	

1 Includes a limited range of services suitable for an employment center: restaurants, banks, etc.
2 Includes a fire station at Lone Tree & Sand Creek and a County Courts facility at Lindsey Basin.
3 Normal site ± 10 acres; extra area required due to rolling terrain.
4 Includes improved Antioch Creek and Lindsey Basin; ridgetop view trail; and other natural open space.

Notes: The breakouts for individual parcels on the following pages include a few instances where the land-use boundaries do not coincide with parcel boundaries; most of these instances are due to the awkwardly shaped parcels created by the Delta Xway ROW. The specific plan will seek to resolve these through like-value lot line adjustments wherever feasible.

The exact boundary of the ridgetop view trail openspace will be determined through the design standards for grading and sitting contained in the specific plan, and may vary slightly from the boundary shown in the alternatives.

Mateas

			Ac	Units
R L	Low Medium Density Res	4 u/acre	5.6	22
R M	Medium Density Res	6 u/acre		0
R H	Medium High Density Res	15 u/acre	8.8	132
			14.4	154
E	Employment			
C N	Community Coml		8.8	
C E	Employment Ctr Coml			
C R	Regional Coml			
F P	Public Facility			
S	School		9.9	
P	Park		1.3	
O	Open Space		18.2	
	Delta Expressway		8.1	
	Arterials & Collectors		4.3	
			65.0	

R Jacuzzi

			Ac	Units	
R L	Low Medium Density Res	4 u/acre	1.6	6	
R M	Medium Density Res	6 u/acre	11.4	68	
R H	Medium High Density Res	15 u/acre		0	
			13.0	75	
E	Employment		34.6		
C N	Community Coml				
C E	Employment Ctr Coml		11.4		
C R	Regional Coml				
F P	Public Facility				
S	School				
P	Park				
O	Open Space		6.1		
	Delta Expressway		8.6		
	Arterials & Collectors		7.5	*Note*	
			81.2		

Note: This category includes land lying between Country Hills Rd & Delta Xway

V Jacuzzi

			Ac	Units
R L	Low Medium Density Res	4 u/acre	77.0	308
R M	Medium Density Res	6 u/acre	35.0	210
R H	Medium High Density Res	15 u/acre		0
			112.0	518
E	Employment			
C N	Community Coml		7.3	
C E	Employment Ctr Coml			
C R	Regional Coml			
F P	Public Facility			
S	School		1.4	
P	Park		1.2	
O	Open Space		35.6	
	Delta Expressway		1.7	
	Arterials & Collectors		0.8	
			160.0	

Nunn

			Ac	Units
R L	Low Medium Density Res	4 u/acre		0
R M	Medium Density Res	6 u/acre	1.3	8
R H	Medium High Density Res	15 u/acre		0
			1.3	8
E	Employment		21.8	
C N	Community Coml			
C E	Employment Ctr Coml			
C R	Regional Coml			
F P	Public Facility			
S	School			
P	Park			
O	Open Space		2.1	
	Delta Expressway		3.4	
	Arterials & Collectors		2.7	
			31.3	

McBail

			Ac	Units
R L	Low Medium Density Res	4 u/acre	53.2	213
R M	Medium Density Res	6 u/acre	43.6	262
R H	Medium High Density Res	15 u/acre	6.2	93
			103.0	567
E	Employment		39.8	
C N	Community Coml		8.1	
C R/N	Community/Regional Coml			
C R	Regional Coml		10.3	
F P	Public Facility		2.4	
S	School			
P	Park		6.9	
O	Open Space		31.9	*Note*
	Delta Expressway		33.0	
	Arterials & Collectors		16.6	
			252.0	

Note: Open space includes 16.6 acres Antioch Creek

Slatten

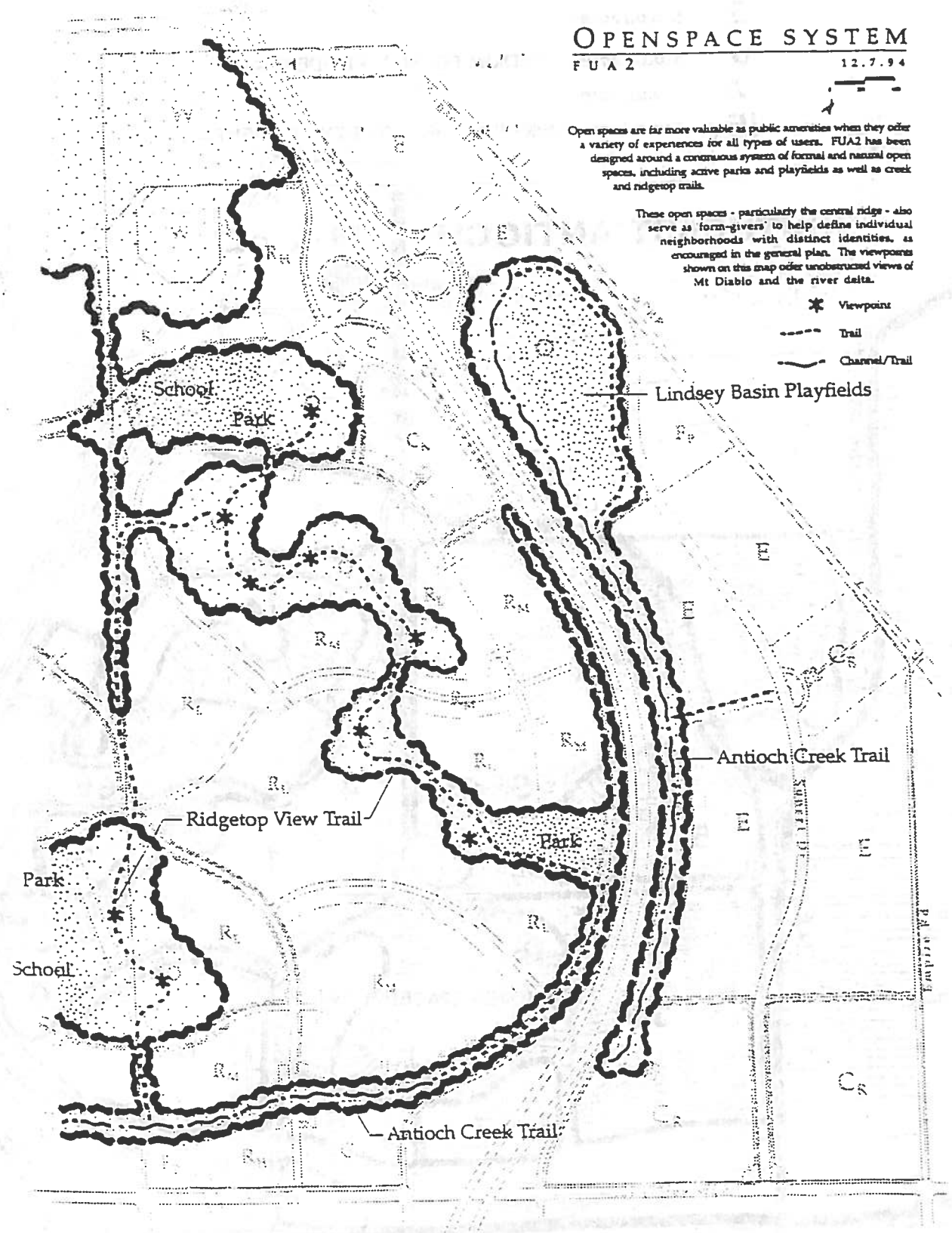
			Ac	Units
R L	Low Medium Density Res	4 u/acre		0
R M	Medium Density Res	6 u/acre		0
R H	Medium High Density Res	15 u/acre		0
			0	0
E	Employment			
C N	Community Coml			
C R	Regional Coml		33.8	
F P	Public Facility			
S	School			
P	Park			
O	Open Space			
	Delta Expressway			
	Arterials & Collectors		1.7	
			35.5	

County & Water Districts

			Ac	Units
R L	Low Medium Density Res	4 u/acre		0
R M	Medium Density Res	6 u/acre		0
R H	Medium High Density Res	15 u/acre		0
			0	0
E	Employment		25.8	
C N	Community Coml			
C R	Regional Coml			
F P	Public Facility		8.4	
S	School			
P	Park			
O	Open Space		36.1	
W	Water District Land		34.5	
	Delta Expressway		28.2	
	Arterials & Collectors		8.0	
			141.0	

Cranmer & Others

			Ac	Units
R L	Low Medium Density Res	4 u/acre		0
R M	Medium Density Res	6 u/acre		0
R H	Medium High Density Res	15 u/acre		0
			0	0
E	Employment			
C N	Community Coml			
C R	Regional Coml		16.8	
F P	Public Facility			
S	School			
P	Park			
O	Open Space			
	Delta Expressway			
	Arterials & Collectors		1.7	
			18.5	



FUA#2 OPEN SPACE SYSTEM

APPROVED AND PROPOSED RESIDENTIAL DENSITIES

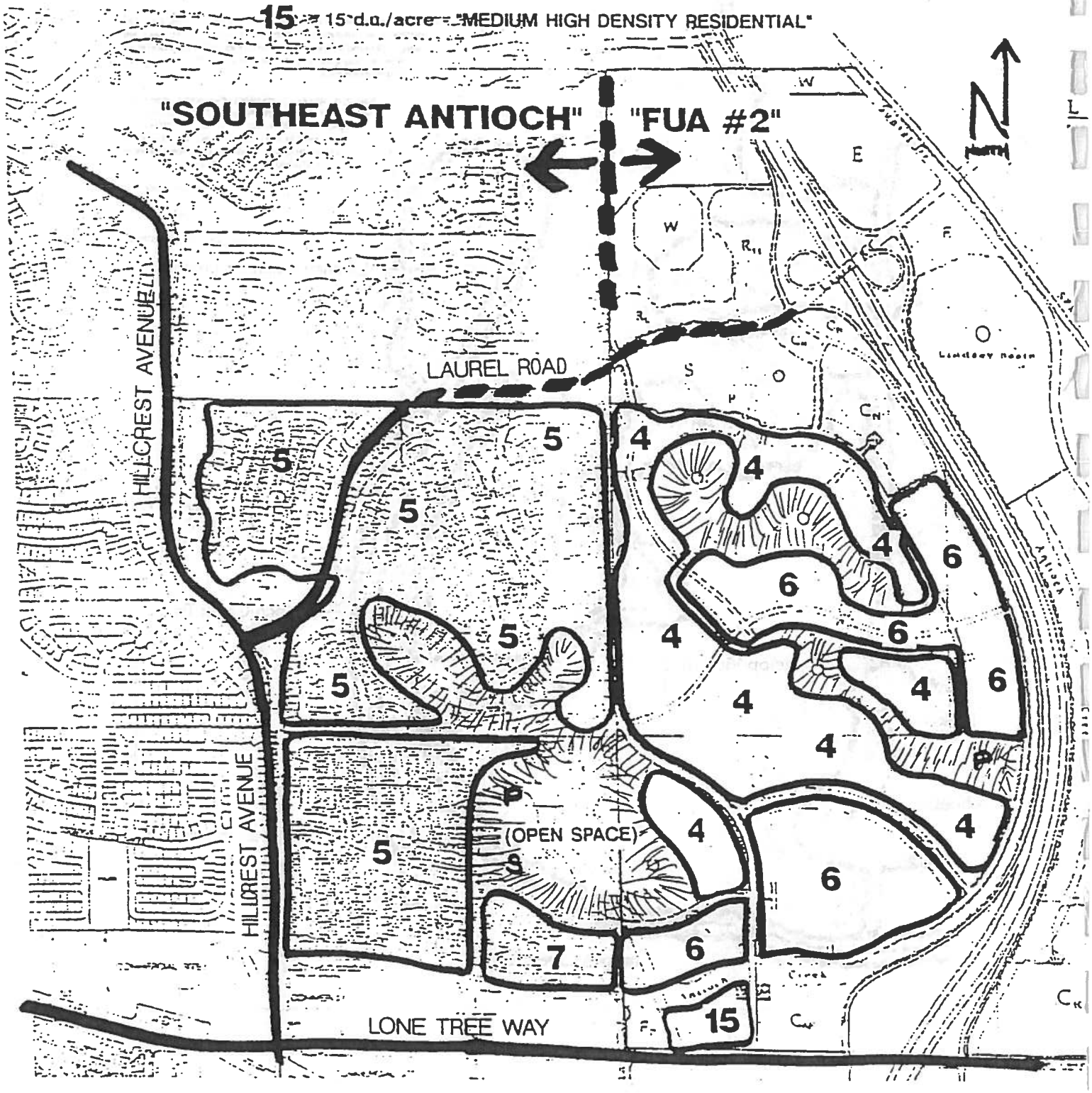
4 – 4 d.u./acre - "LOW DENSITY RESIDENTIAL"

5 – 5 d.u./acre

6 – 6 d.u./acre - "MEDIUM DENSITY RESIDENTIAL"

7 – 7 d.u./acre

15 – 15 d.u./acre - "MEDIUM HIGH DENSITY RESIDENTIAL"



RESIDENTIAL DENSITIES AT FUA #2 AND ADJACENT SOUTHEAST ANTIOCH PROJECTS

FUA #2 — POLICY PAPER

Prepared by:

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Land Use Consultants
3452 Sacramento Street
San Francisco, CA 94118

Prepared for:

The City of Antioch
Department of Development Services

December 1993

HIGHLIGHTS
FUA #2 POLICY PAPER

Existing Antioch policy gives direction to the preparation of a Specific Plan for FUA #2 in a number of important areas. The attached policy paper enumerates many of these and cites them to their source in existing City documents. Key directives that anchor the framing of the Specific Plan include these:

- Development will focus on employment use: FUA #2 is intended to be developed as a **major employment center** for East Contra Costa County. **Premature urbanization is to be avoided,** since it could result in suboptimal development.

- The majority of FUA #2 should be devoted to **suburban-type business parks.** These facilities would be located on the flatland areas of the FUA. Major office and light industrial uses are to be developed in accordance with **high standards of design** and should project an **image of quality.**

- The **hills are more suitable for residential use.**

- Residential development will include a variety of types, including **multi-family and affordable housing.**

- The City is to show **flexibility in design and development standards** in order to encourage the desired types of development within the physical framework of the FUA. However, residential development in FUA #2 must be sited and designed to protect residents from potential **noise and air quality impacts of major transportation facilities.**

- Development will reflect land contours and natural features (creeks and drainages, vegetation, views). The land use plan should reflect City policy with regard to **hillside development, protection of views and creek preservation.**

- FUA #2 may have sites suitable for retail use. However, the City should **avoid retail "over-building".** Periodic re-evaluation of commercial development needs should be undertaken.

- New residential development shall **support its own service costs,** both capital and operating.

FUA #2: POLICY PAPER

I. PURPOSE

The purpose of this paper is to provide a summary of existing Antioch development policy applicable to the Specific Plan for Antioch's Future Urbanization Area #2 (FUA #2). Direction previously given with regard to planning for the area is described and the source of that direction given. This paper is intended to assist the site planner and City representatives in assuring that the Specific Plan will conform with the intent of City government.

This paper has been drafted by Mundie & Associates, lead consultant on the Specific Plan, the EIR and the Fiscal/Financing Study, under the direction of Victor Carniglia and with assistance of the Department of Development Services.

Sources referred to in the preparation of this paper include the following:

Antioch General Plan, City of Antioch, adopted December 1988
Environmental Impact Report on the *Antioch General Plan*, September 1988
Opportunities and Constraints Report, FUAs #1 and 2, prepared for the City of Antioch by Mundie & Associates, October 7, 1991
Housing Element, *Antioch General Plan*, City of Antioch, adopted October 27, 1992
Creek Development Policy, City of Antioch, Resolution No. 92/237, October 27, 1992
Memorandum of Understanding Concerning Boundary/Open Space between the Cities of Antioch and Brentwood, October 27, 1992
Tree Ordinance, Draft #3, City of Antioch, September 17, 1993
Annexation Agreement for FUA #1, approved by Antioch City Council May 1993
Staff Report to the Antioch City Council for Consideration at the Council Meeting of September 14, 1993

II. INTRODUCTION

The area known as FUA #2 is part of the community study area reviewed as part of the Southeast Specific Plan (1982), but it was not part of the area for which detailed planning was done at that time. In the 1988 General Plan, FUA #2 was delineated. The extreme southeastern area of FUA #2 did not lie within Antioch's sphere of influence as of the time of the 1988 General Plan, but was added in 1990. In September 1993, LAFCo approved the annexation of approximately 300 acres of FUA #2 fronting Lone Tree Way; final annexation action by Antioch is pending. The balance of FUA #2 is expected to be annexed once the Specific Plan is completed.

The most important policy document with regard to FUA #2 is the *Antioch General Plan, 1988-2000* (December 1988). Other sources of policies guiding development decisions for the FUA include formal City policies relating to locations or types of resources lying within the boundaries of FUA # 2, other planning documents and specific direction given by the Antioch City Council. Policies to date have covered a broader area than the FUA (for example, much General Plan policy covers the entire city) or have been ad hoc (according to land use type or function). Therefore, existing policies – while the appropriate starting point for planning in the FUA – may not fully address the range of choices relevant to the Specific

Plan. The current policy basis for planning may need to be augmented or modified to respond to site-specific opportunities and constraints. The General Plan identified a Specific Plan as the appropriate next step in planning for FUA #2. The Specific Plan will be the vehicle for setting forth city planning and development policy for the FUA in a comprehensive, consistent and coherent manner.

The paper is organized around the topics that will be key components of the Specific Plan:

- land use
- urban design
- infrastructure and circulation
- public facilities and services
- open space and landscaping
- approval process, phasing, and financing program

Sources of policies cited are indicated in italics following each policy statement or group of statements. Policies that appear in this paper but not in the FUA #1 policy paper are shaded.

III. LAND USE

Future land use designations for FUA #2 were not specified in the 1988 General Plan because the Plan anticipated that development would occur primarily after the year 2000. However, the plan suggests that the hilly portions of FUA #2 may be more appropriate for residential uses, while the flatland portions may be most appropriately identified for development of employment generating uses. *General Plan*, p. 62

Residential

Background. Areas of Antioch that have been developed in residential uses are generally single-family at moderate density (about 5 units per net acre). General Plan and zoning designations also allow for areas of medium residential densities (6-10 units per gross acre) and high density (up to 20 units per gross acre). City staff note that these permissive designations have often not been taken advantage of, with development more typically continuing the predominating pattern of moderate density single-family even where higher density is allowed.

Types of Development Permitted. General Plan policy is to encourage the development of enough multiple-family housing to ensure the affordability of rental housing for all sectors of the population. *General Plan*, p. 38

The General Plan also encourages diversity of housing through a number of mechanisms: density bonuses for low and moderate income units, manufactured housing, second units in appropriate single-family areas, potential for mobile home parks . . . *General Plan*, various

. . . and the Planned Development District process, which can create diversity by allowing flexibility in design and development standards. *Housing Element*, p. 63

At the other end of the spectrum, the General Plan encourages the provision of sites for the development of custom homes in order to enhance the architectural diversity of the housing stock. *General Plan*, p. 15

Siting. Medium and higher density residential development is to be sited generally on arterial and collector streets near commercial centers, medical and other services, and transit. *General Plan*, p. 14

The General Plan addresses siting of land uses with respect to each other and to contextual features: (a) air pollution-sensitive uses are to be separated from air pollution point sources such as manufacturing facilities and major arterial roads and freeways; and, (b) noise-sensitive uses are to be separated from noise-generating uses; the General Plan (Appendix C) establishes land use compatibility criteria. The background ambient noise level for outdoor areas of residential units (back yards and patios) shall not exceed 60 CNEL. *General Plan*, p. 49, 50, 51

Design Features. The City encourages appropriate design features for residential development to establish identity and a sense of community. Each neighborhood should have its particular design features (landscaping, entry ways, wall treatments, architecture) to create distinctive neighborhoods and to give residents a greater "sense of place". *Housing Element*, pp. 74, 75

The design of street systems should strengthen neighborhood identity. Use landscaping and [other] techniques to establish the identity and function of streets in neighborhoods; investigate alternative street design standards in neighborhoods to reflect distinctive neighborhood environments.
Housing Element, pp. 74, 75

Retail Uses

General Plan policy comprises two principles: (1) the 'unmet need' principle, intended to ensure sufficient market demand to justify and support any proposed retail development, and (2) the 'economic development' principle, intended to support commercial development that will improve the city's economic base. Within the time frame of the General Plan (to the year 2000), these policies would have the effect of limiting new regional commercial development to the vicinity of the County East Regional Shopping Center.
General Plan, p. 15

Beyond the year 2000, additional population may create demand for additional regional facilities. If so, city policy would guide such development (1) away from new "strip" commercial situations, (2) into upgrading and revitalization of existing "strip" commercials, and (3) concentrated retail centers (which are easier to service than "strip" centers). *General Plan*, pp. 10, 15, 40

Commercial needs are to be periodically re-evaluated; market studies by independent analysts are to be completed prior to review of proposed commercial development. *General Plan*, p. 16

Employment Uses

Antioch's economic development goals include improving employment opportunities for local residents, stimulating business activity and diversifying and strengthening the local economy. (Fiscal goals are identified in Part VII below.) *General Plan*, p. 39

The General Plan calls for land to be reserved for future employment center development. This policy is specifically intended to apply to the period beyond the General Plan's time horizon.
General Plan, pp. 11, 40

FUA #2 is intended to be developed as a major employment center for East Contra Costa County. The majority of the land is to be set aside for future suburban type business parks that encompass major offices and light industrial uses developed in accordance with high standard design guidelines. In the interim, the lands are envisioned as continuing in agricultural use; premature encouragement of urbanization in FUA #2 could result in suboptimal development. *General Plan*, p. 62

The General Plan calls on the City to identify policies to designate large tracts of land in the southeastern corner of the planning area for industrial/business park development; the employment potential of this area at buildout would be approximately 37,500. *General Plan*, p. 11

New employment development is envisioned as light industrial, heavy industry being precluded by a number of environmental and economic factors. *General Plan*, p. 60

With regard to the entire area south of State Route 4, the Plan calls for "very low intensity" industrial uses, administrative offices, research and development uses, and retail uses limited to those serving surrounding businesses and their employees. *General Plan*, pp. 40, 11

The General Plan includes a policy calling for revising development regulations to encourage more efficient use of land in employment areas; clear, logical development and performance standards for industrial, commercial and service uses are needed to help create an image of quality in new development projects. *General Plan*, p. 40

Require the preparation of marketing plans for projects containing employment generating uses. [Such plans would provide decisionmakers with insight into development feasibility and implementation time lines, so that decisionmakers can be assured that the overall goal of balance between residential and employment development is honored.] *Housing Element*, p. 61

Planning Flexibility

Mixed Use Areas. The General Plan encourages the mixture of residential and non-residential uses, where appropriate, if the uses are compatible and result in a neighborhood unit. *General Plan*, p. 12

Density Transfers. Transfers of density should be encouraged where they would allow (a) preservation of environmental resources important to Antioch residents, (b) provision of high-quality urban amenities, and/or (c) protection of residents through design that is sensitive to environmental constraints. *General Plan*, p. 12

IV. URBAN DESIGN

Urban Form

The General Plan calls for preserving and maintaining the present predominance of low-density residential development within existing and future neighborhoods throughout the city; it also calls for maintaining a compact urban form and efficient service area. *General Plan*, p. 13

Visual and Environmental Resources

Community design and development standards set forth in the General Plan would guide development in the FUA in a manner that would protect certain environmental and visual resources:

View Corridors. View corridors to hills, ridge lines and the San Joaquin River are to be protected by avoiding the siting of structures or landscaping in a manner that would block views from adjacent properties. Lone Tree Way, the southern boundary of FUA #2, is identified as a visual corridor.

Edges. "Edges" are defined as visual boundaries between neighborhoods and adjacent communities, providing relief from urban sprawl and reinforcing neighborhood identity.

While the existing alignment of SR 4 at the eastern edge of the Antioch planning area has been identified as an "edge", the General Plan does not identify a specific delineator has been identified with regard to FUA #2. *General Plan*, p. 43-44

It is the goal of Antioch and Brentwood to establish (1) an open space buffer and/or urban design features to separate and distinguish the two communities, (2) compatible policies regarding open space requirements, grading and hillside preservation and (3) protection of views of Mt. Diablo.

Memorandum of Understanding, ¶ 7

Hillside Areas. Hillside areas are to be reserved for low residential density to retain the natural environmental features; hilly slopes are seen as contributing to the unique identity of residential neighborhoods. To the greatest extent possible, building and pad elevations should reflect the natural contour of the hillside through the use of reduced street sections, split building pads and limitations on the size of flat pad area.

General Plan, p. 14

Environmentally Sensitive Areas and Areas of Visual Prominence. The General Plan allows for clustering of residential units to preserve these kinds of areas where clustering would allow for the maximum amount of publicly accessible open space and the provision of major public amenities. *General Plan*, p. 14

Design of Public Facilities and Infrastructure. Sound barriers may be used to mitigate noise problems; dense vegetation combined with berms are considered more attractive than masonry walls.

General Plan, p. 51

Trees. Antioch is in the process of considering an ordinance to regulate tree removal, for the purpose of retaining as many trees as possible in order to enhance the aesthetic quality of the city. The draft ordinance identifies established trees subject to protection within three categories: mature trees (≥26 inches in diameter at 4.5 feet above grade), landmark trees (≥48 inches in diameter and/or in excess of 40 feet in height) and indigenous trees (naturally-growing trees of various oak, buckeye and bay species). The ordinance identifies the conditions under which tree removal in conjunction with property development may be sought, and establishes procedures to be followed. With regard to planning for the FUA, the effect of the ordinance would be to require preparation of an inventory of established trees (mature, landmark and indigenous) prior to any action that might affect those trees, and to specifically request from the appropriate agency approval of any tree removal as part of the development application process. Draft Tree Ordinance

The General Plan includes a policy calling for revising development regulations to encourage more efficient use of land in employment areas; clear, logical development and performance standards for industrial, commercial and service uses are needed to help create an image of quality in new development projects.

General Plan, p. 40

V. INFRASTRUCTURE AND CIRCULATION

Infrastructure

The City encourages design of residential areas to lessen impacts on utilities and natural resources.

Housing Element, p. 76

The General Plan describes infrastructure goals for the city's water, wastewater management, solid waste management, and storm drainage system. With respect to new development, related policies refer to the responsibility of new development to provide (financially and otherwise) for capacity in infrastructure systems. *General Plan*, p. 24-28

Antioch's Creek Development Policy includes direction on the design and operation of detention basins that are intended to be guidelines for project development. *Creek Development Policy*, p. 10

Transportation

The General Plan establishes service standards for traffic. *General Plan*, p. 33

The location of FUA #2 , in close proximity to housing, near a proposed expressway interchange and along a potential commuter rail line, provides several opportunities to reduce reliance on single-occupant automobile travel. The *Opportunities and Constraints Report* for the FUAs (October 1991) suggested that the following opportunities should be considered:

- An employment center in this area should be sure to set aside space for day care, to reduce roadway miles traveled during morning and evening commute periods.
- The development should be laid out so as to be "transit friendly". This means that building should be clustered together with minimum setbacks from arterial streets. This allows buses to more easily serve the development. Clustering buildings near the SPTCo rail tracks could be a favorable incentive for community rail in this are, and increase potential patronage.
- Provision of retail at this location would enable employees to leave cars at home and do errands during the day on foot. The retail might also draw customers from nearby residential development.
- The feasibility of providing high density, moderately price housing near the employment center would also boost the ability of the development to internalize commute traffic.

Opportunities & Constraints Report, p. 7

Developers of large projects (residential and non-residential) are to take part in projects to improve traffic flow and/or reduce vehicle trips. *General Plan*, pp. 50-51

VI. PUBLIC FACILITIES AND SERVICES

The General Plan calls for the provision of adequate sites for schools, parks and other public facilities, conveniently located in all residential neighborhoods. *General Plan*, p. 14

The General Plan calls for the provision of adequate and appropriate sites for quasi-public institutions and facilities (such as religious institutions and child care facilities) in new residential areas.
General Plan, p. 15

The General Plan sets forth services standards for fire service, police service, water supply, sanitary facilities, flood control and parks. *General Plan*, p. 32-33

VII. OPEN SPACE AND LANDSCAPING

The General Plan allows for clustering of residential units in some areas (steeps slopes and otherwise environmentally-sensitive lands) in order to maximize publicly accessible open space; clustering is to be on the areas of low or moderate slopes with the more rugged topography remaining undeveloped.

General Plan, pp. 14, 56

General Plan suggestions regarding establishment of "natural preserves" may not apply to FUA #2, which appears unlikely to host endangered, threatened or candidate species, and which has been committed (via the choice of the Delta Expressway alignment) to development. The General Plan direction that the city require new development to include habitat-sensitive feature and design characteristics and preservation of oak woodlands also appear inapplicable (to be verified in the course of EIR preparation).

The revegetation of creek banks is also called for in the General Plan; this policy would be applicable to East Antioch Creek in the event it is not culverted. *General Plan*, p. 51

Antioch's Creek Development Policy includes direction on the simultaneous satisfaction of flood control needs and design and aesthetic requirements described in the policy. Both Sand Creek (FUA #1) and East Antioch Creek (FUA #2) would be subject to the Creek Development Policy. *Creek Development Policy*, p. 10

The General Plan advocates that the city continue to devise and strengthen measures to require developers to dedicate a reasonable amount of land as permanent open space. New development shall fully improve park sites as part of their development, or pay a fair share of such improvement, and the city shall require landscape maintenance districts for new development to maintain parks and open space area.

General Plan, p. 54

Although much of FUA #2 is still agricultural, the General Plan Land Use Map designates all land in the city's planning area for eventual urban use. The General Plan seeks to avoid conflict between development and agriculture by establishing (1) transition zones between urban and agricultural areas and (2) buffer zones to prevent drift of fertilizers and pesticides from agriculture onto adjoining agricultural areas. The General Plan also discourages non-contiguous development, as a way of avoiding premature conversion of agricultural land to urban use. *General Plan*, p. 19

The spheres of influence (SOIs) of Antioch and Brentwood border on one another at Lone Tree Way, which is the southern boundary of FUA #2. Antioch and Brentwood have reach an agreement, articulated in a Memorandum of Understanding (MOU) between the two cities, regarding common boundaries. The agreement has a term of 30 years, with a provision for review and amendment every five years. As noted in Part IV above, the provisions of Paragraph 7 of the agreement could affect open space planning along the two cities' SOI boundary in FUA #2, which call for:

> 7a. An open space buffer and/or urban design features to separate and distinguish the two communities, and,
>
> 7b. Compatible policies regarding open space requirements, grading and hillside preservation, and protection of views of Mt. Diablo.

Memorandum of Understanding

VIII. APPROVAL PROCESS, PHASING AND FINANCING PROGRAM

Two important outside factors influencing the timing of future development in FUA #2 are:

(1) the construction of a major new road, referred to as the Delta Expressway and now commonly called the State Route 4 Bypass, which would traverse FUA #2 in a north/south corridor, and

(2) the City's desire to assure orderly development of areas already committed to urbanization (e.g., the Southeast area).

The Future Urbanization Areas are to be developed only after substantial commitment to development of adjacent areas closer to the urban core of the city. *General Plan*, p. 12

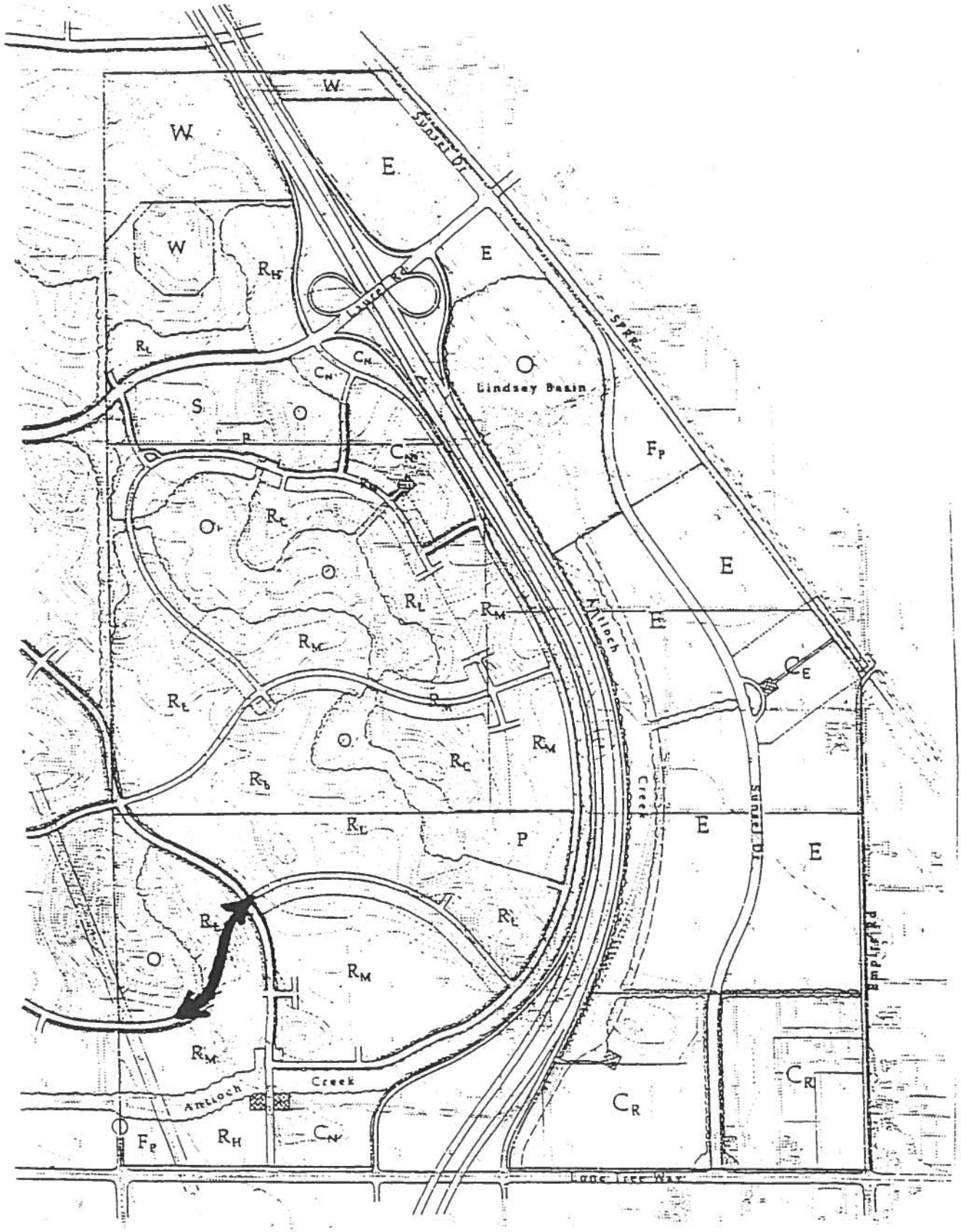
The demand for and timing of development in the FUAs is to be determined based on market feasibility analyses and on the potential impact of FUA development on remaining undeveloped lands in surrounding areas. *Opportunities and Constraints Report*, p. 28

The General Plan (p. 62) specifies that a Specific Plan for FUA #2 can proceed when either (1) the alignment for the SR 4 Bypass (the Delta Expressway) through the area is established, or, (2) an agreement is reached between the city and a major employer seeking to locate in the area. Both of these timing criteria have been effectively met as the right-of-way for the expressway has been established and a draft EIR completed, and Kaiser Permanente has been an active participant in the Specific Plan process for both FUA #1 and FUA #2, with the goal of locating a major medical facility in the area.
Staff Report to Antioch City Council, September 14, 1993, pp. 1-2

New development is required to provide necessary infrastructure and services by using such mechanisms as assessment districts, fees, Community Facilities Districts and reimbursement agreement.
General Plan, p. 13

Antioch's economic development goals include increasing local revenues and encouraging investment in the local community in pursuing its economic goals. *General Plan*, p. 39

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REALIGNMENT OF COUNTRY HILLS DR.

Model Description
East Contra Costa County Model

The purpose of the model is to provide a tool to help implement the Measure C (1988) Growth Management Program, to conduct major traffic impact studies and environmental analyses, evaluate alternative transportation improvement strategies, and support planning for major Measure C transportation improvements. The model was validated to year 1990 conditions and provides travel forecasts for the years 2000 and 2010.

The model was developed with the participation of a Technical Advisory Committee (TAC) made up of representatives of the cities of Pittsburg, Antioch and Brentwood, Contra Costa County, Caltrans, and the Contra Costa Transportation Authority (CCTA).

GENEALOGY OF THE MODEL AND RELATIONSHIP TO OTHER MODELS

The model is a focused version of the Contra Costa County travel demand model developed for use in the County's General Plan Update in the late 1980's. The countywide model was developed by Barton Aschman Associates and is sometimes called the "517 zone model" since it had 517 zones within Contra Costa County. The 517-zone model is, in turn, derived in part from the regional MTC travel demand model system.

This model of eastern Contra Costa County is one of four subarea models being developed simultaneously for the Contra Costa Transportation Authority to help implement Measure C. The other models cover West County, Central County and the Tri-Valley Area (including portions of Alameda County). The model software and data input assumptions are generally consistent with the MTC models, the countywide model, and the other subarea models being developed for the Authority.

The models run on PC computers using EMME/2 modeling software. They cover the entire 9-county Bay Area, and use a standard four-step transportation modeling procedure.

Readers interested in detailed documentation of the model should obtain the *Draft Model Documentation Travel Model Eastern Contra Costa County*, June 1992.

MODEL FRAMEWORK

The travel model forecasts traffic flows on study area roadways and transit facilities by combining mathematical representations of the transportation network, land use and demographic patterns, and people's travel making behavior. The model consists of three key data sets:

- transportation network and zone system
- land use and demographic assumptions
- travel behavior assumptions.

These data are used to generate travel forecasts using the traditional four-step transportation planning process:

- Trip generation
- Trip distribution
- Mode choice
- Trip assignment.

A brief description of these portions of the model is presented below.

Transportation Network and Zone System

This is a computerized description of the highway and transit services available in the area. It includes characteristics such as free flow speeds, number of lanes, capacity, transit routes and headways, and park-and-ride lots.

Within eastern Contra Costa County, the travel network includes all freeways, major and minor arterial streets, and many collectors. Local streets are not included, but are represented as load points to the major street system. Less detail is provided in other areas of Contra Costa County, where only freeways and major arterials are represented.

The map of the Bay Area is also split up into traffic analysis zones (TAZs), that represent the travel demand in a given geographic area. TAZs are made at a finer level of detail in East County to enable reasonable forecasts on specific roadway links and intersections. As with the network, less detail is provided further away from East County.

Land Use and Demographic Assumptions

The amount of travel demand in a particular zone is related to the amount of activity in that zone. In this model, activity is measured by the number of households, and the amount of different types of employment: retail, service and other.

Demographic factors also play a role. This model uses the number of persons per household, and average household income as an input to the trip generation models.

Trip Generation

The trip generation portion of the model estimates the amount of different types of travel expected to come from different land uses. Trip types are:

- Home-based-work
- Home-based-shop/other
- Home-based-social/recreation
- Home-based-school
- Home-based Diablo Valley College
- Non-home-based

Trip generation includes estimates of daily trip *productions*, usually the home end of a trip, and daily trip *attractions*, usually the non-home end of a trip. For non-home-based trips, the production is the origin end, while the attraction is the destination end.

Two different approaches to trip generation are used in the model. Outside Contra Costa County, average trip generation rates published by MTC for the different trip purposes are used to derive appropriate trip rates.[1] These rates are based on the number of households and total employment in a particular TAZ.

Within Contra Costa County, a more refined trip generation model is used, which consists of:

- A submodel to estimate households by income group and household size,
- A set of equations to estimate trip productions (i.e. the "home" end of a trip), using household size and income.
- A set of equations to estimate trip attractions, using total employment, retail employment, service employment, other employment, households, population, and university student enrollment.

Trip Distribution

A gravity model is used to estimate the interaction of travel between different TAZs. The gravity model assumes that the amount of travel from one zone to all other zones is proportional to the number of trip attractions in the other zone, and inversely proportional to the travel impedance

[1] Metropolitan Transportation Commission, *Congestion Management Program Databook #1, Regional Summary*, March 1991.

between the two zones. Impedances are measured using congested travel speeds for work trips. For non-work trips, free flow speeds are used. The travel impedances have a different effect on the average trip lengths for the different trip purposes.

Mode Choice

The mode choice models within Contra Costa County are multinomial logit models that are consistent with the MTC regional models. For home-based-work trip purposes, there are four possible modes:

- Transit
- Drive-alone-auto
- 2-person auto
- 3+ person auto

For other trip purposes, only auto and transit trips are determined. An auto occupancy factor is used to convert auto person trips to auto vehicle trips that can be assigned onto the network.

Outside of Contra Costa County, fixed external mode probabilities are used as a basis for mode choice. The model allows for the percentage of transit trips to shift based on a pivot point logic for any changes in the Contra Costa County transit network, such as BART extensions.

Trip Assignment

Before auto and transit trips can be assigned to the network, they are converted from 24-hour person-trip tables in production-attraction format to A.M. peak hour, P.M. peak hour, and off-peak period trip tables in origin-destination format.

Peaking factors contained in the original County model were modified to obtain a better fit to travel patterns in East County.

Assignments are done using a capacity-constrained equilibrium method. The first iteration of a peak-hour assignment uses congested travel speeds from a previous assignment. Then, assignments are iterated using capacity-constrained link travel speeds from the previous assignment. The assignments are repeated until the differences in travel speed from one iteration to the next are insignificant, at which time *equilibrium* is said to be achieved.

It should be noted that the capacity constraints are only reflected for trips on Contra Costa County roadway segments. Outside Contra Costa County, the model structure does consider the effects of capacity constraints on roadway speeds; constant speeds are used for each study year. Speeds on facilities outside of Contra Costa County are pre-set to estimated congested speeds obtained from the MTC regional model for the model forecast year.

Assignment of Trips External to the Bay Area. The original County model did not reflect travel to and from outside the nine-county Bay Area. This was consistent with the MTC model. However, for forecasts to be used in East County, as well as Tri-Valley, and to a lesser extent in Central and West County, this "external" travel estimate is needed.

A procedure to account for non-Bay Area traffic was developed through the modelers coordination process, and finalized by Barton Aschman Associates for use on the West County model. The vehicle trip tables developed for the West County model were used for the East County model, with appropriate modifications to account for the more detailed zone system.

The approach to assignment of external traffic may be summarized as follows:

- Year 1990 estimates of travel on I-580 across the Altamont pass were made based on MTC's license plate survey in 1987.
- Year 1990 estimates of travel across the San Joaquin County line at SR 4 were developed based on a gravity model procedure developed by DKS for the Delta Expressway EIR study. Similar procedures were used for other minor gateways, such as Byron Highway.
- Estimates of year 2000 and 2010 vehicle traffic at gateways was determined through discussions with MTC staff for I-580 and SR 17 and US 101 at the Santa Clara County border. Reductions in non-retail employment were made to the database to reflect in-commuters from these gateways.
- Estimates of year 2000 and 2010 vehicle traffic across the minor gateways was simply doubled over existing values.

NETWORK/ZONE SYSTEM DEFINITION

Zone System

DKS prepared a preliminary draft and draft version of a refined zone structure for East County that was submitted to the four jurisdictions and the Transportation Authority for review. After comment, a final zone map was prepared. The refined zone system is a subset of the 517-zone county-level structure, the 1980 Census tracts, and the MTC's 550-zone system. In the remaining portions of Contra Costa County, the traffic zones are consistent with those used in the county model.

There are a total of 890 zones in the East County model: 437 zones in East County, 398 zones in the remainder of Contra Costa County, and 38 zones in the remainder of the Bay Area. The

final zone system maps (dated October 19, 1991) were provided to each agency during the model development process and are not provided in this report.

Highway Network

DKS refined the highway network to provide a suitable level of detail for implementation of the Authority's Growth Management Program. DKS prepared roadway maps showing the proposed street system to be included in the 1990 network, including critical roadway characteristics such as number of lanes, facility type (freeway, arterials, collectors) and area type (i.e., CBD, residential, rural). These maps were sent to each of the jurisdictions for review, and then finalized after comment.

For the year 2000 and 2010 forecast years, DKS obtained information from each of the jurisdictions regarding funded and planned projects. The following criteria were used to determine whether projects were to be included in either of the future year networks:

- **Year 2000:**
  - All projects constructed since 1990,
  - Measure C projects in the first seven years of the CCTA's Strategic Plan,
  - Programmed projects on the State Transportation Improvement Program (STIP), and
  - Programmed locally funded projects in each jurisdiction's five year Capital Improvement Program (CIP).
- **Year 2010:**
  - Year 2000 improvements,
  - All projects in the Contra Costa County Congestion Management Program (CMP) Capital Improvement program (CIP),
  - Projects included in the Draft Regional Transportation Plan (DRTP) Blend Alternative, and
  - Future projects shown in local General Plans or other approved planning documents consistent with the RTP.

Transit Networks

For the 1990 model, transit networks previously developed for the countywide model were updated based on a review of current service. For the year 2000 and 2010 model, updates to the transit network were made based on the same criteria as the highway network.

DEMOGRAPHIC AND LAND USE DATA

The travel demand model requires land use and demographic data at the appropriate zone level for all nine Bay Area counties. The nine Bay Area counties were divided in the following regional areas:

- Region 1 - East Contra Costa County
- Region 2 - The remainder of Contra Costa County
- Region 3 - Other eight Bay Area counties

The following information is provided for zones within Contra Costa County, which is consistent with the 517-zone model:

1. Number of households
2. Household population
3. Employed residents
4. Household income (expressed in 1979 dollars)
5. Retail employment
6. Service employment
7. Other employment
8. Total acres
9. High school enrollment[2]
10. College enrollment (DVC)

For the areas external to Contra Costa County, the zonal structure is at an aggregated level; therefore only the total number of jobs and households for each traffic zone is included.

Recht Hausrath & Associates (RHA) worked closely with the staffs of each jurisdiction to obtain information on current land use patterns, development trends, and issues related to the amount and location of future growth in the East County area.

[2] The high school enrollment variable was only used in East County zones.

1990 Base Year Scenario

A 1990 base year scenario was prepared at the traffic zone level of detail for the East County area. Census block data counts of dwelling units (1990 census) were aggregated to traffic zones and were the basis for the 1990 household estimates.

For the employment estimates, the 1985 data used in the 517-zone model were organized according to the more detailed traffic zones. The estimates were then updated to 1990 using information from local jurisdictions on projects built between 1985 and 1990.
School enrollment data was obtained through the *1991 Contra Costa County Public School Directory*. It was formatted and merged into the model after the trip generation stage.

The zonal information for East County was input to the Land Use Information System (LUIS) prepared by Economic and Planning Systems. The LUIS takes similar information from the other subareas, and provides data files in EMME/2 format. The data includes disaggregate information within East County and aggregate information in the other portions of Contra Costa County. The data is fully consistent with that being used for the other subarea modeling efforts.

The information was provided in draft form to each jurisdiction for review. Then, based on comments, modifications were made and a final version was produced.

Year 2000 and 2010 Projections

Modifications to the year 1990 data files were made to produce year 2000 and 2010 projections. The changes involved making assumptions about where growth would occur in East County. These judgments were made by RHA, with guidance from the staff of each jurisdiction. The ABAG *Projections '90* estimates of households and employment for the years 2000 and 2010 for the entire East County subarea were used as approximate control totals. The scenarios are not based simply on build-out of existing general plans. The economic and demographic growth rates implied by ABAG *Projections '90* were used in conjunction with detailed land use information to develop this assessment of the amount and allocation of employment and population growth within East County. The scenarios were developed in consultation with members of the TAC and planning staff representing each jurisdiction.

Year 1990, 2000, and 2010 household and employment data for areas external to the County (Region 3) was prepared by DKS directly from ABAG *Projections '90*.

TRAFFIC DATA COLLECTION AND BASE CONDITION LEVEL OF SERVICE (LOS) ANALYSIS

Validation of the travel model involves comparison of the model results to actual traffic count data. Counts for both roadway links, as well as intersection turning movements were needed.

Traffic counts taken between 1989 and 1991 were considered acceptable for use in the 1990 model validation comparisons. The traffic count data base used for this comparison was compiled using the following approach:

- DKS prepared a map of East County that illustrated locations where DKS already had count data, and locations where count data would be needed for model validation.
- Jurisdiction representatives reviewed this map, and provided additional information, if available.
- Jurisdictions were asked to collect additional data to fill in the gaps. For facilities that were on the proposed Routes of Regional Significance[3], DKS collected additional information.

In all, 70 intersections were identified for evaluation, and link counts at about 200 locations were obtained.

Intersection levels of service (LOS) was calculated at the 70 study area intersections. The results of the traffic counts, and the LOS analysis was provided to each jurisdiction and the CCTA in 1991.

MODEL IMPLEMENTATION AND VALIDATION

DKS updated the model application procedures to reflect the revised zonal structure. Then, the various portions of the model (network, demographics/land use, and model procedures) were brought together to test how well the model replicated year 1990 travel conditions, i.e. model *validation*. Model validation involved these steps:

1. Daily person-trip generation and distribution estimates from the East County Model were compared to those contained in the Metropolitan Transportation Commission (MTC) model on a countywide basis. Appropriate adjustments in trip rates were then made to bring non-Contra Costa County trip productions and attractions closer to the MTC estimates.

2. The model's estimates of mode choice were compared to actual transit ridership information and MTC estimates for both high occupancy vehicles and transit. Adjustments were made to the external transit probability matrix to improve the BART ridership estimate to other Bay Area counties to reflect actual observed ridership.

[3] Routes of Regional Significance are the focus of the Action Plans that are being prepared by the four subregions of Contra Costa County as part of implementing Measure C (1988).

3. Travel across key screenlines between areas of Contra Costa County, and within East County was compared to estimates from the model. Adjustments were made to peaking and diurnal factors to improve the assignment across these screenlines.

4. Further refinements were made to the network to refine traffic assignments to specific links or groups of links. Refinements include changes to speed and capacity assumptions on links.

The validation results were reviewed with the East County Model Subcommittee and approved by the Authority and the TRANSPLAN Committee prior to proceeding with traffic forecasting. Validation results may be found in the *Draft Model Documentation.*

TRAVEL FORECASTS AND ANALYSIS

DKS ran the model to produce the 2000 and 2010 forecasts. The reasonableness of the forecasts were checked by comparing screenline and link level data with existing traffic and validated 1990 model output. The following results were analyzed:

- A.M. and P.M. peak hour and average daily traffic volumes on freeways, arterials and collectors.

- A.M. and P.M. peak hour turning movements at selected intersections.

- A.M. and daily transit ridership on BART, Tri-Delta Transit and CCTA.

After one round of review by the TAC, model results were refined. The results were then adjusted using the CCTA's model post-processor (VCCC) which uses the Furness method of intersection turning movement balancing. This adjustment reflects how well the model replicated existing conditions in the forecasts. Base forecast results may be found in the *Draft Model Documentation.*

APPENDIX D

Fundamentals of Acoustics

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. Decibels and other technical terms are defined in Table 1.

Most of the sounds which we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies, with each frequency differing in sound level. The intensities of each frequency add together to generate a sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound in accordance with a weighting that reflects the facts that human hearing is less sensitive at low frequencies and extreme high frequencies than in the frequency mid-range. This is called "A" weighting, and the decibel level so measured is called the A-weighted sound level (dBA). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. Typical A-levels measured in the environment and in industry are shown in Table 2 for different types of noise.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources which create a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L_{10}, L_{50}, and L_{90}, are commonly used. They are the A-weighted noise levels equaled or exceeded during 10%, 50%, and 90% of a stated time period. A single number descriptor called the L_{eq} is now also widely used. The L_{eq} is the average A-weighted noise level during a stated period of time.

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes very noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, a descriptor, L_{dn} (day/night average sound level), was developed. The L_{dn} divides the 24-hour day into the daytime of 7:00 AM to 10:00 PM and the nighttime of 10:00 PM to 7:00 AM. The nighttime noise level is weighted 10 dB higher than the daytime noise level. The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes both an evening and nighttime weighting.

The effects of noise on people can be listed in three general categories:

- subjective effects of annoyance, nuisance, dissatisfaction
- interference with activities such as speech, sleep, learning
- physiological effects such as startling, hearing loss

The levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise in the last category. Unfortunately, there is as yet no completely satisfactory way to measure the subjective effects of noise, or of the corre-

sponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance, and habituation to noise over differing individual past experiences with noise.

Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of the existing environment to which one has adapted: the so-called "ambient".
In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by the hearers.

With regard to increases in A-weighted noise level, knowledge of the following relationships will be helpful in understanding this report.

- ❒ Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived.
- ❒ Outside of the laboratory, a 3 dB change is considered a just-perceivable difference.
- ❒ A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
- ❒ A 10 dB change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse change in community response.

Table 1

Definitions of Acoustical Terms

TERM	DEFINITIONS
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels in the night between 10:00 pm and 7:00 am.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Table 2

Typical Sound Levels
Measured in the Environment and Industry

Noise Source (distance away in feet)	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
	140		
Civil Defense Siren (100')	130		
Jet Takeoff (200')	120		Pain Threshold
	110	Rock Music Concert	
Pile Driver (50')	100		Very Loud
Ambulance Siren (100')			
	90	Boiler Room	
Freight Cars (50')		Printing Press Plant	
Pneumatic Drill (50')	80	In Kitchen With Garbage Disposal Running	
Freeway (100')			
	70		Moderately Loud
Vacuum Cleaner (10')	60	Data Processing Center	
		Department Store	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')			
	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
	0		

FINAL
ENVIRONMENTAL IMPACT REPORT

FUTURE URBANIZATION AREA #2
SPECIFIC PLAN
ANTIOCH, CALIFORNIA

Prepared by

Mundie & Associates
Consultants in Land Use and Economics
and
City of Antioch

State Clearinghouse # 93-111069
November 8, 1995

CHAPTER I

INTRODUCTION
TO THE FINAL ENVIRONMENTAL IMPACT REPORT

A. BACKGROUND

This document, together with the draft environmental impact report (DEIR) published by the City of Antioch in August, 1995, constitutes the final environmental impact report (FEIR) on the proposed Specific Plan for Future Urbanization Area #2 (FUA #2) in the eastern area of Antioch.

In conformance with the California Environmental Quality Act of 1970 (CEQA) as amended, the City of Antioch provided the public with an opportunity to comment on the adequacy of the DEIR. Comments were accepted during the 45-day public review period, which ran from August 25 to October 9, 1995.

As required under the provisions of CEQA, comments made during the review period are to be addressed in a final environmental impact report (FEIR) for consideration by the lead agency prior to action on the project.

B. COMMENTS ON THE DEIR

The City of Antioch received written comments on the DEIR from nine (9) commenters during the review period. The full written communications from these nine commenters are presented in Chapter II, numbered from 1 through 9.

Public hearings before the Planning Commission were held on September 20 and October 4, 1995. These meetings elicited comments by Planning Commission members relating to the EIR (as well as to other aspects of the Specific Plan). The Commissioners' comments on the DEIR are presented in this volume in the form of pages from the Planning Commission minutes. Commissioners' comments at the September 20 meeting are designated as communication 10; at the October 4 meeting, as communication 11.

The DEIR was submitted to the State Clearinghouse for distribution to state agencies for CEQA review. Communication number 12 from the State Clearinghouse indicates their receipt of the DEIR and the state agencies to which the document was sent.

C. CONTENTS OF THIS FEIR

1. Draft Environmental Impact Report (DEIR)

The DEIR published August 25, 1995, is hereby incorporated by reference into this FEIR.

2. Written Comments on the DEIR

Written communications that offer comments on the DEIR received by the City of Antioch during the public review period are presented below in Chapter II. These communications are numbered 1 through 12. Where a communication included more than one comment, the comments have been lettered A, B, C, etc., in the margins of the communications.

3. Responses to Comments

Responses to the comments are presented in Chapter II of this document, immediately following the written communications. In the responses, the comments responded to are designated by communication number and then comment letter; for example, comments in communication 1 are referred to in the responses as 1A, 1B, 1C, etc.

D. FEIR PREPARERS

This FEIR has been prepared by Mundie & Associates under contract to the City of Antioch under the overall supervision of Victor Carniglia. Technical assistance was provided by Baseline Environmental Consulting (public health, DKS Associates (transportation), Illingworth & Rodkin (noise), H. T. Harvey & Associates (biology), and McGill Martin Self (infrastructure). Individuals participating in FEIR preparation, in addition to individuals named in the DEIR, include Norm Dyer and Greg Mattson of McGill Martin Self and Phillip Serna of Mundie & Associates.

CHAPTER II

COMMENTS AND RESPONSES

A. NOTES ON CONTENT AND FORMAT OF THE RESPONSES

The 1995 Draft Environmental Impact Report (DEIR) for the FUA #2 Specific Plan was prepared following the preparation and publication of the *Antioch Infrastructure Plan* EIR in June, 1992. That plan-level EIR addressed large-scale planning, environmental and infrastructure service considerations for two areas since annexed to the City of Antioch: Future Urbanization Areas #1 and #2. The 1992 EIR contains much information relating to FUA #2 that has been drawn on in the preparation of both the draft Specific Plan and the DEIR, and the DEIR builds on (and contains frequent references to) the earlier EIR. Chapter I of the FUA #2 Specific Plan DEIR describes the relationship between the two documents in greater detail. This FEIR continues to draw on the work in the previously-certified *Infrastructure Plan* EIR to respond to some of the comments presented below.

The comments identified below are limited to comments that relate to the DEIR and to environmental issues raised by the Specific Plan. CEQA does not require that fiscal issues raised by planning projects and approvals be addressed in an EIR. Fiscal issues raised by the Specific Plan have been addressed in a separate fiscal report.

In responding to comments, this FEIR makes a number of revisions to the text of the DEIR. The language used to indicate where such amendments are made is "The EIR is hereby amended to ..." followed by the amended language. Where amendments affect a mitigation measures proposed in the DEIR, the full mitigation measure is produced in the response, with deleted language indicated by strikethroughs (~~xxxxxx~~) and new language indicated by underlines (xxxxxx).

B. TEXT OF COMMUNICATIONS ON THE DEIR AND RESPONSES

The DEIR comments are reproduced on the pages that follow, with responses to each written communication immediately following that communication.

COMMUNICATION 1

Delta Diablo Sanitation District

OFFICE AND TREATMENT PLANT: 2500 PITTSBURG-ANTIOCH HIGHWAY, ANTIOCH, CA 94509
TELEPHONE: (510) 778-4040 ADMIN. FAX: (510) 778-8513 ENG. FAX: (510) 706-7156 MAINT. FAX: (510) 778-8565

October 2, 1995

Ms. Roberta Mundie, President
Mundie & Associates
3452 Sacramento Street
San Francisco, CA 94118

SUBJECT: COMMENTS ON DRAFT ENVIRONMENTAL IMPACT REPORT FOR FUA #2

Dear Ms. Mundie:

Thank you for the opportunity to review and comment on the Draft EIR. We have reviewed the Public Services section relating to wastewater services and have the following comments:

a. The District has both a Conveyance System and a Treatment Plant Master Plan to identify specific wastewater needs in the conveyance system and treatment plant to accommodate growth planned within the District's service area. 1A

b. Based on conversations with the City of Antioch, the properties within FUA #2 were annexed into the District under deferral of District annexation fees. The District's annexation fees would be due upon processing of a subdivision map or through payment by the City from an assessment district that would be subsequently formed. 1B

c. Page 113, Mitigation Measures for Impact G3. Development of project site could result in an increase in the use, storage and disposal of hazardous wastes. Mitigation Measures should also include a requirement that businesses must apply, obtain and comply with Wastewater Discharge Permit issued by Delta Diablo Sanitation District. 1C

Very Truly Yours,

Gregory G. Baatrup
Planning and Development Engineer

GGB:dj

cc: Victor Carneglia, City of Antioch
Ricardo P. Cruz, DDSD

Responses to Communication 1 (Delta Diablo Sanitation District)

1A The comment suggests that the Delta Diablo Sanitation District's Conveyance System and Treatment Plant Master Plan should be referenced in the DEIR. Chapter III, Subsection I.c. (p. 126) discusses the District's improvements and plans as cited by the commenter.

1B Comment noted.

1C Comment noted. Mitigation Measure G3 (p. 113) is hereby amended as follows:

> Existing federal, state and local hazardous materials laws and regulations, and household hazardous waste programs would mitigate potential hazards associated with hazardous materials management. Businesses ~~that manage hazardous materials have specific permit, storage and reporting requirements depending on the types of hazardous materials managed.~~ such as auto repair, photo developing, dental and medical facilities, dry cleaning and restaurants shall be required to obtain a Wastewater Discharge Permit issued by the Delta Diablo Sanitation District and comply with all of the District's current regulations pertaining to the discharge of wastewater.

State of California **THE RESOURCES AGENCY**

M E M O R A N D U M

To : Project Coordinator
Resources Agency

Date: October 11, 1995

Ms. Roberta Mundie
Mundie & Associates
3452 Sacramento Street
San Francisco, California 94118

From : **Department of Conservation**
Office Of Governmental and Environmental Relations

Subject: Draft Environmental Impact Report (DEIR), Specific Plan, Future Urbanization Area #2, (FUA #2) - **SCH# 93111069**

The Department of Conservation (Department) has reviewed the DEIR for the Specific Plan, Future Urbanization Area #2 in the City of Antioch. The Department monitors farmland conversion on a statewide basis, administers the California Land Conservation (Williamson) Act, and monitors operation, maintenance, and abandonment of oil and gas wells. The Department offers the following comments:

Land Conservation

The project is the specific plan for the development of approximately 785 acres of agricultural land for residential, commercial, and employment-generating land uses, including public uses such as a school, park, open space, transportation and public facilities. For a comprehensive discussion of the agricultural character of the project area and potential project impacts, the Final Environmental Impact Report (FEIR) should also include the following information:

Prime Agricultural Land

The California Code of Regulations (Section 15000 et seq., Appendix G [y]) states that a project will normally have a significant effect on the environment if it converts prime agricultural land to non-agricultural use or impairs the agricultural productivity of prime agricultural land. According to the Antioch Infrastructure Plan EIR, the Farmland mapping and Monitoring project of the California Department of Conservation has classified virtually all of the land in FUA #2 as either prime farmland, farmland of statewide significance, or farmland of local importance. Therefore, the Final Environmental Impact Report (FEIR) should identify the conversion of prime agricultural land as a significant impact of the project. 2A

Agriculture Production Data and Economic Multiplier

Since most of the land within the project area is in agricultural production, the following data should be provided. 2B

- Describe current and past agricultural use of the project area.
- Provide data on types of crops grown, yields, and crop values.

- Discuss the economic value of agricultural production. Economic multipliers can be used to assess the total agricultural value to the economy. **An example of an agricultural crop value table and crop values used with an economic multiplier is enclosed for your information.** 2C

Farmland Conversion Impacts

- Indicate the type, amount, and location of farmland conversion resulting from project development. 2D
- Discuss impacts on current and future agricultural operations.
- Discuss cumulative and growth-inducing impacts.

Mitigation Measures and Alternatives

Some possible mitigation could include:

- Directing urban growth to lower quality soils in order to protect prime agricultural land.
- Increasing densities or cluster residential units to allow a greater portion of the development area to remain in agricultural production.
- Establishing buffers such as setbacks, berms, greenbelts, and open space areas to separate farmland from urban uses.
- Implementing right-to-farm ordinances.
- Adopting a farmland protection program utilizing transfer of development rights, purchase of development rights and conservation easements, and establishment of farmland trusts.

Operation, Maintenance, and Abandonment of Oil and Gas Wells

The proposed project is located within the administrative boundaries of the River Break Gas field and the Brentwood oil field. As stated in the DEIR, 9 wells have been drilled within the project boundaries. Eight of the 9 wells have been plugged and abandoned.

If any structure is to be located over or in the proximity of a previously plugged and abandoned well, there is the possibility that the well may need to be replugged and abandoned to current Division specifications. Section 3208.1 of the Public Resources Code authorizes the State Oil and Gas Supervisor to order the reabandonment of any previously abandoned well when construction of any structure over or in the proximity of the well could result in a hazard. The cost of reabandonment operations is the responsibility of the owner of the property upon which the structure will be located. 2E

If any abandoned or unrecorded wells are uncovered or damaged during excavation or grading, remedial plugging operations may be required. If such damage occurs, the Division's district office in Sacramento (916-322-1110) must be contacted to obtain information on the requirements and approval to perform remedial operations. 2F

Although the possibility for future problems from gas wells that have been plugged and abandoned or reabandoned to the Division's current specifications are remote, a diligent 2G

effort should be made to avoid building over any abandoned well. If construction over an abandoned well is unavoidable, we suggest that an adequate gas venting system be placed over the well.

Follow up questions regarding oil and gas wells can be answered by Robert Reid at the Division of Oil, Gas, and Geothermal Resources district office. The Address is: 801 K St., M.S. 20-22; Sacramento, CA., 95814-3530, (916) 322-1110. If I may be of further assistance, phone me at (916) 445-8733.

Jason R. Marshall
Acting Assistant Director
Office of Governmental and Environmental Relations

Attachments

cc: Kenneth E. Trott, Office of Land Conservation
Contra Costa Resource Conservation District
Bob Reid, Division of Oil, Gas, and Geothermal Resources, Sacramento
Mike Stettner, Division of Oil, Gas, and Geothermal Resources, Sacramento

The California Department of Conservation reports that in Fresno County between 1986 and 1990, a total of 3,404 acres of farmland were converted to urban uses. Of this total, 1,362 acres were prime farmland and 524 acres were farmland of statewide importance (California Department of Conservation, 1990: p. 22, 1992: p. 16). The eventual loss of 172 acres of prime farmland, 98 acres of potential prime farmland, and 22 acres of farmland of statewide importance is considered to be a significant environmental impact. The project will contribute to the continuing rapid loss of farmland on the margins of the Fresno-Clovis Metropolitan Area.

Crops on the portions of the project site used for agriculture are approximately as follows: truck crops (including onions, strawberries, melons, tomatoes, bell peppers, and sweet corn), 121 acres; almonds, 65 acres; plums, 10 acres; and nectarines, 7 acres.

Information provided by the Fresno County Department of Agriculture in its *1992 Agricultural Crop and Livestock Report* provides a basis for estimating the value of the loss of these crops. The annual crop value on the site is estimated at $733,440 (see Table E-2).

TABLE E-2

VALUE OF AGRICULTURAL CROPS

Crop	Acres	Crop Value Per Acre	Total Value
Truck Crops*	121	$4,373	$529,133
Almonds	65	$2,083	135,395
Plums	10	$3,156	31,560
Nectarines	7	$5,336	37,352
			$733,440

*Truck crops grown on the site include onions, strawberries, melons, tomatoes, bell peppers, and sweet corn. Various combinations of these crops are grown from year to year and precise breakdowns are not available. For purposes of estimating crop value, therefore, the 1992 value of these crops were averaged together to obtain a composite per acre figure.

Source: Fresno County Department of Agriculture. *1992 Fresno County Agricultural Crop and Livestock Report.*

The value of agricultural production is not limited to its gross sales value. The income generated by farms passes through the local economy as households, farms, local businesses, processors, and government agencies all purchase goods from one another. This phenomenon results in an indirect or multiplier effect, in which the value accounted for by crops in the local economy is much larger than their gross sales value. The "weighted average county economic multiplier" has been estimated at 3.2 (Sarquis, 1981: p. 39). Multiplying the total estimated gross value of crops grown ($733,440) by 3.2 results in a total value to the local economy of $2,346,880, a generation of $1,613,480 more than the initial value of the crops.

Responses to Communication 2 (State of California, Department of Conservation)

2A Comment noted. Upon further consideration of the issue raised by the commenter, Chapter V, Subsection A.3.a. (p. 159) and Chapter IV, Section A (p. 156) are hereby amended as follows:

V.A.3.a Cumulative land use impacts would occur as a result of the conversion of agricultural lands to urban use, which would contribute incrementally to the loss of agricultural lands on a region-wide basis (*Antioch Infrastructure Plan* EIR, p. 214). This loss would constitute a significant and unavoidable cumulative impact under CEQA.

IV.A Because the proposed Specific Plan includes only non-agricultural land uses, the consumption of prime agricultural land cannot be partially or entirely avoided. As stated in Chapter V (p. 159) the Specific Plan would contribute to a significant and cumulative impact on prime agricultural land. This impact cannot be mitigated to a less-than-significant level. Therefore, the impact is significant and unavoidable.

2B Comments noted. Current and historical agricultural uses on the project site include primarily grazing and hay production, and some orchards. No portion of the project site is currently used for intensive cultivation of row crops. Chapter III, Subsection A.1. Land Use (p. 15) discusses current agricultural uses on the project site.

2C The foregone economic value when agricultural production is discontinued does not raise a CEQA issue.

2D Comments noted. Most of the area proposed for development according to the FUA #2 Specific Plan consists of one of four types of farmland: "Prime Farmland," "Farmland of Statewide Importance," "Farmland of Local Importance," or "Grazing Land." These use designations are shown in Figure 15 of the *Antioch Infrastructure Plan* EIR (p. 53).

As noted in Responses 2A and 2B, impacts on current and future agricultural operations, and cumulative impacts are discussed in Chapter III, Subsection A (p. 19) and Chapter V, Subsection A.3.a. (p. 159), respectively.

2E Comment noted. Mitigation Measure G4 (p. 114) is hereby amended as follows:

Construction of structures for human occupancy over abandoned gas wells shall be discouraged. Geotechnical reports prepared for grading plans shall include identification of the location of all abandoned gas wells. If abandoned wells are identified, the method of abandonment shall be described and evaluated for possible hazards, and the State Oil and Gas Supervisor's Office shall be notified. By state law, the State Oil and Gas Supervisor may order the reabandonment of any previously abandoned well when construction of any structure over or in the proximity of the well could result in a hazard. The cost of reabandonment is the responsibility of the owner of the property upon which the structure will be located. The design of any structure for human occupancy located over an abandoned gas well shall incorporate gas/vapor barrier systems with appropriate provisions for ventilation of accumulating gas.

2F Comment noted.

2G Comment noted.

COMMUNICATION 3

OCT 20 1995

CONTRA COSTA
WATER DISTRICT

1331 Concord Avenue
P.O. Box H20
Concord, CA 94524
(510) 674-8000 FAX (510) 674-8122

Directors

Joseph L. Campbell
President

Elizabeth R. Anello
Vice President

Bette Boatmun
Donald P. Freitas
James Pretti

Walter J. Bishop
General Manager

October 19, 1995

Roberta Mundie, President
Mundie & Associates
3452 Sacramento Street
San Francisco, CA 94118

Subject: Comments on Draft EIR for Future Urbanization Area #2 Specific Plan

Dear Ms. Mundie:

Thank you for the opportunity to review and comment on the Draft EIR for the Future Urbanization Area No. 2 (FUA-2) Specific Plan for the City of Antioch. The Contra Costa Water District (CCWD) comment covers primarily the correction and updating of mapping information dealing with CCWD owned lands. The Specific Plan is within the existing CCWD service area boundaries.

The FUA-2 Specifc Plan area consists of approximately 785 acres of primarily undeveloped land in southeast Antioch bounded by Lone Tree Way on the south, Empire Road and the Southern Pacific Railroad on the east and northeast and the Contra Costa Canal on the north. The Specific Plan calls for residential, commercial and employment-generating land uses as well as open space and recreational lands and new arterial, collector and local streets. The Specific Plan at full buildout envisions up to 1,322 housing units and employment generating land uses for up to 8,335 workers.

CCWD would generally comment that the Federal Endangered Species Act (FESA) should be addressed in the environmental document, and encourages agencies to coordinate, if necessary, with the U.S. Fish and Wildlife Service. CCWD notes that FESA issues are discussed in Chapter III, Vegetation and Wildlife, pages 133-146. Specific comments on Chapter III, as well as on the full document, are provided, below, in the order of document coverage.

Chapter II, Project Description, pages 6-8. On page 8 (also page 18), the CCWD Los Vaqueros Project (LVP) Pipeline plans are identified. However, Figure 3 (page 6) and Table 2 (page 7) do not reflect the location and acreages currently acquired for the Pipeline. This is understandable given the simultaneous Draft EIR and LVP land acquisition activities. Approximately 5 acres (of the 85 foot wide pipeline right-of-way) have been purchased from McBail adjacent to the designated Delta Expressway right-of-way. Another 4.2 acres have been released through court ordered possession (October 1994) from Jacuzzi and Nunn. The remaining pipeline from the Nunn property northward will be installed in an easement from Contra Costa County in the Lindsey Basin. These changes may require corresponding changes to other listed acreages in Table 1 (page 4) and Table 2. A Los Vaqueros Pipeline ROW Layout diagram is enclosed (Enclosure 1) which may be helpful. For more specific boundaries of CCWD's land acquisitions, please contact Felicia Dean, CCWD consultant for land acquistion (510/674-8162 to be changed to 510/688-8162 effective October 30, 1995). 3A

With respect to pipeline construction, excavation has commenced from the Lindsey Basin southward with completion on the County property scheduled by early November 1995. Pipeline installation is projected for completion to Lone Tree Way by the end of 1995 (some grading has been performed on the former McBail property). There will be some remaining vault construction in the Lindsey Basin near the Contra Costa Canal in early 1996 with total project LVP Pipeline completion scheduled for April 1996.

The acreage cited for "Water District Land" (to be changed reflecting the additional lands acquired, as noted above) should be clarified to indicate that approximately 16.9 acres represent the Contra Costa Canal, currently owned by the U.S. Bureau of Reclamation (USBR).

Chapter III B., Transportation, pages 46 and 55. Figures 12 and 15 should be corrected to show the relocated Vasco Road beginning at a point approximately one mile north of the Walnut Boulevard/Camino Diablo intersection. 3B

Chapter III I., Infrastructure, page 124. Following the conclusion of the first paragraph which outlines the available CCWD water supplies, it would be appropriate to indicate that CCWD's Future Water Supply Study (FWSS) will more precisely identify projected water supplies and demands and provide strategies and alternatives to meet long-term demands within the CCWD planning area. The recommended wording for an additional paragraph is: 3C

CCWD has undertaken a Future Water Supply Study (FWSS) to develop an action plan to implement environmentally sound options to ensure a long-term high quality water supply throughout the CCWD planning area. The FWSS will identify water demands, supplies, and strategies for various alternative service area scenarios to the year 2040. From the alternatives analysis, the preferred service area/demand alternative(s) plan will be selected in early 1996.

Chapter III J., Vegetation and Wildlife, pages 133-146. On page 133, the Setting Methodology and Overview indicates that "specific surveys for special status plants and animals were not conducted". However, after a thorough review of existing information, including previous reconnaissance level surveys, it is concluded (on page 142, under Loss of Plant and Animal Species of Special Status) that special status species "are not expected to occur within the planning area". Table 29 (page 138) further addresses each Endangered or Threatened Species that occur in the project vicinity in habitats similar to those on the project (Specific Plan area) site and finds that all seven listed species are presumed absent, due to the lack of suitable habitat or other reasons (birds with transient status and no potential for breeding habitat or San Joaquin kit fox with no denning habitat).

On page 143, it is indicated (from a reconnaissance-level survey in the Lindsey Basin) that the California Red-legged frog and Western Pond Turtle (both Federal Candidate Species) "potentially occur in the freshwater marsh at the north end of the planning area on lands of the Contra Costa Water District." The reference to CCWD ownership is also repeated on page 144, in the first paragraph under Impact J1. If the subject marsh location is that which is identified on Figure 30 (page 134) by a symbol listed as "A" for "Aquatic" (in the Legend), it could not be located on CCWD owned lands. A close examination of property mapping records (see Enclosure 2, from Exhibit [for] 34.23 Acre Annexation to Diablo Water District) shows that the marsh is in the extreme 3D

northwest corner of the Lindsey Basin owned by Contra Costa County. Please verify marsh location with property records and make necessary textual corrections, if necessary, for accuracy.

The Draft EIR appears to conclude that any potential for Federal Candidate species (e.g., Western Pond Turtle) habitat is associated with wetland areas. Mitigation Measure J1 assigns the responsibility for further wetland habitat planning to the developer in accordance with City and U.S. Corps of Engineers permitting requirements.

Chapter V, Cumulative and Growth Inducing Impacts, page 161. Figure 32 indicates a "Kellogg Reservoir" as a Proposed Development. CCWD has acquired most of the 18,000 acre Kellogg Creek watershed for the Los Vaqueros Reservoir. While this location has been considered as a potential reservoir site in the past, there is not currently a proposed development in the sense of a defined project with a projected timeframe for construction. It may be more meaningful to identify the entire existing CCWD ownership boundaries in the watershed since CCWD has committed to preserve the watershed it acquires for open space preservation (watershed protection, recreational and educational benefits) somewhat similar to the purposes in the definition of boundaries for the nearby "State and Regional Parks" ownership. 3E

Chapter VII, Sources. Please correct the spelling for Greg Gartrell. Mr. Gartrell's current title has changed to Director of Planning from "Engineer". Also, please make the same spelling corrections on Page 124, footnotes 61 and 64. 3F

If you have any questions on the comments or require further information on the CCWD (e.g., land ownership mapping), please contact Dennis Pisila, Senior Planner at 510/674-8119 (510/688-8119 starting October 30, 1995).

Sincerely,

Gregory Gartrell
Director of Planning

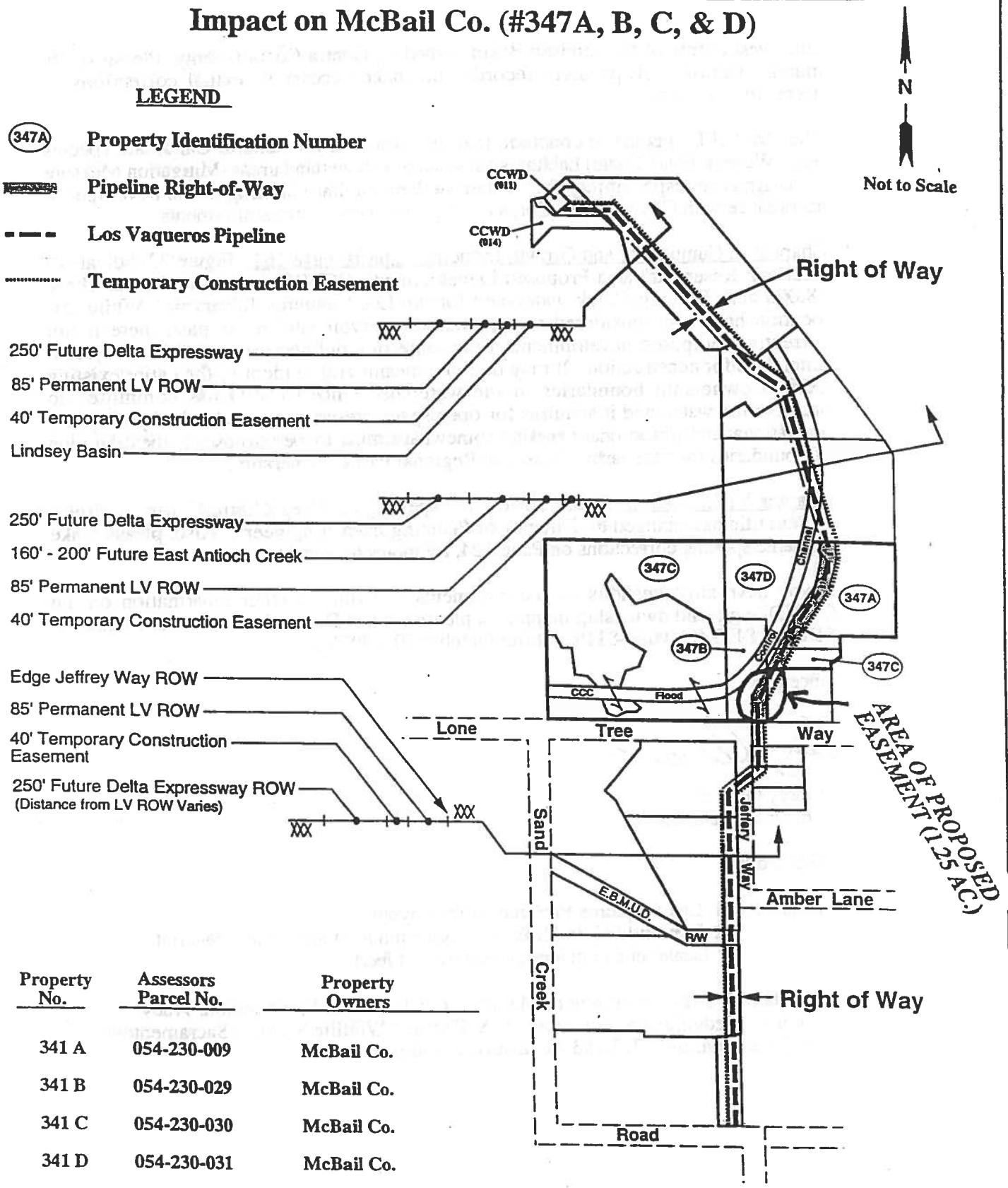
GG/DP/dlh

Enclosures: 1. Los Vaqueros Pipeline ROW Layout
2. Exhibit [for] 34.23 Acre Annexation to Diablo Water District (scale: one inch approximately 300 feet)

cc: Herbert S. Y. Ng, Acting Area Manager, U.S.Bureau of Reclamation, Tracy
Joel A. Medlin, Field Supervisor, U.S. Fish and Wildlife Service, Sacramento
Felicia Dean, CCWD Land Acquistion consultant

LOS VAQUEROS PIPELINE ROW LAYOUT

Impact on McBail Co. (#347A, B, C, & D)



Property No.	Assessors Parcel No.	Property Owners
341 A	054-230-009	McBail Co.
341 B	054-230-029	McBail Co.
341 C	054-230-030	McBail Co.
341 D	054-230-031	McBail Co.

Mac 138 April 12, 1994

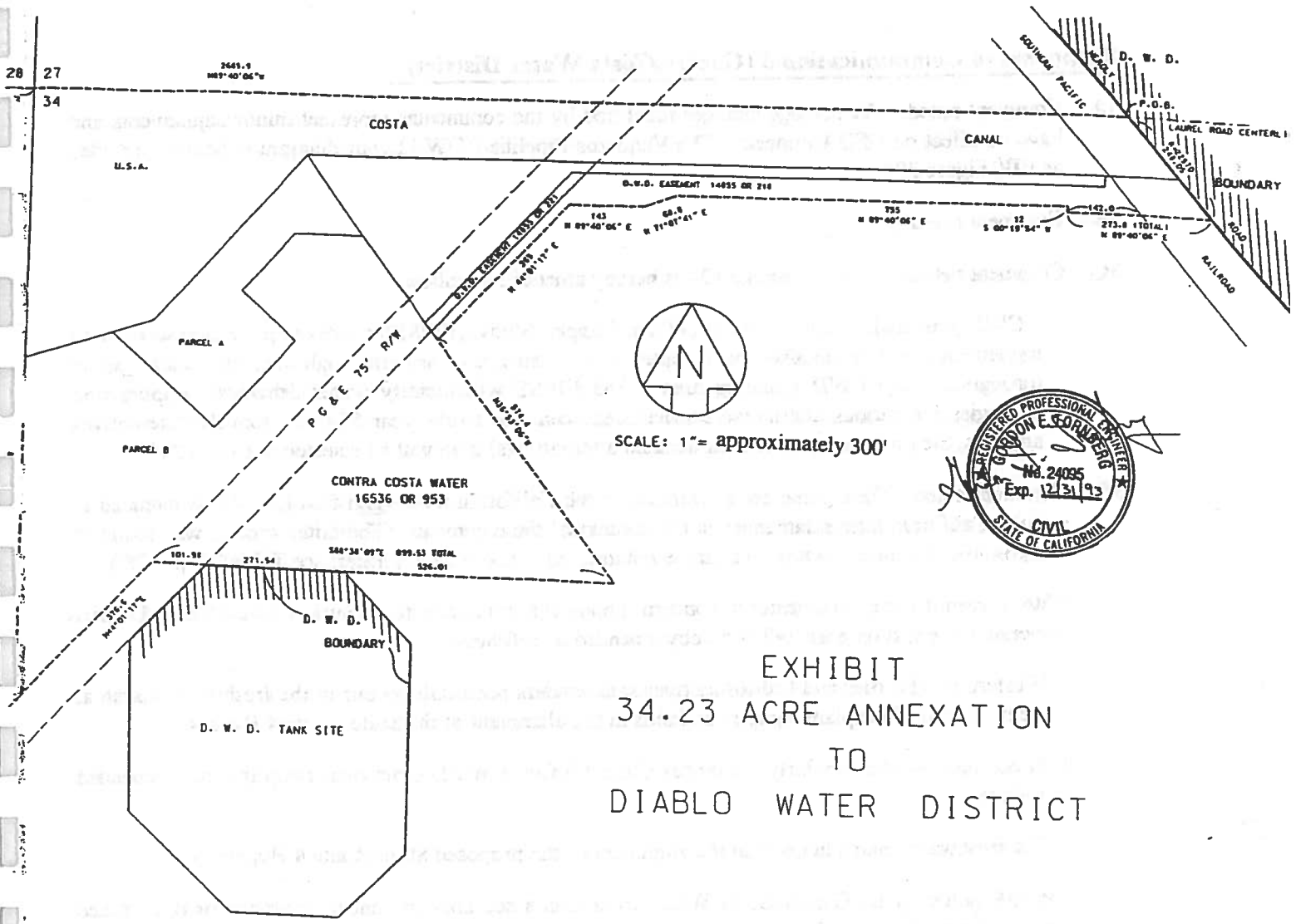


EXHIBIT
34.23 ACRE ANNEXATION
TO
DIABLO WATER DISTRICT

Responses to Communication 3 (Contra Costa Water District)

3A Comment noted. The acreage changes identified by the commenter represent minor adjustments and have no effect on CEQA impacts. The Vaqueros Pipeline ROW Layout diagram is hereby provided as EIR Figure 39.

3B Comment noted.

3C Comment noted. The text on page 124 is hereby amended as follows:

> CCWD has undertaken a Future Water Supply Study (FWSS) to develop an action plan to implement environmentally sound options to ensure a long-term high quality water supply throughout the CCWD planning area. The FWSS will identify water demands, supplies and strategies for various alternative service area scenarios to the year 2040. From the alternatives analysis, the preferred service area/demand alternative(s) plan will be selected in early 1996.

3D Comment noted. The commenter's reference to the California red-legged frog (p. 143) is intended to cite the California tiger salamander in the context of the comment. (The latter species was found to be "possible" on the site while no suitable habitat was found for the former; see Table 29, p. 138.)

With regard to the commenter's concern about the reference to Contra Costa Water District ownership, the text on page 143 is hereby amended as follows:

> Western pond turtles and California tiger salamanders potentially occur in the freshwater marsh at the north end of the planning area on lands in the alignment of the State Route 4 Bypass.

Text on page 144 that similarly references Contra Costa Water District ownership is hereby amended as follows:

> The freshwater marsh lies within the alignment of the proposed State Route 4 Bypass.

3E The EIR hereby notes Contra Costa Water District's stated commitment to preserve for open space preservation the watershed it acquires.

3F The corrections indicated are hereby made.

OCT 2 1 1995

Land Planning Consultants
INCORPORATED

Real estate & facilities consulting for public entities

October 20, 1995

Roberta Mundie, President
Mundie & Associates
3452 Sacramento Street
San Francisco, California 94118

VIA Facsimile 415.441.9683
Hard Copy by U.S. Postal

RE: Future Urbanization Area #2, Antioch

Dear Ms. Mundie:

Land Planning Consultants, Inc. provides real estate and facility consulting services to public school districts. In that regard we represent the Liberty Union High and Brentwood Union School Districts. Both school districts have asked that I respond to the Draft Environmental Impact Report (DEIR) for Future Urbanization Area #2, Antioch.

Brentwood Union School District: The DEIR correctly identified the projected students (231 elementary and 99 middle) that will be generated from new residential development in Future Urbanization Area #2 and within the school district's service boundary, assuming 661 residential units. These students, along with students generated by additional new developments within the district's service boundary, will adversely impact the school district's facilities beyond current enrollment capacity.

To accommodate students generated by new residential development additional school facilities will be needed. The school district is currently completing construction on a new middle school and is planning the construction of a new elementary school. These new schools will assist in housing students generated from new development, however, additional new schools will be needed based on the amount of new residential development planned within the school district's service boundary, including Future Urbanization Area #2.

Liberty Union High School District: The DEIR projected that development within Future Urbanization Area #2 would generate 53 senior high school students, utilizing a student yield rate of 0.08. This yield rate is lower than what the school district experiences. The correct rate is 0.19. Therefore, this amount of development will generate 126 students, or

4A

73 more students than identified in the DEIR . These students, along with the students generated by other new developments within the district's service boundary, will adversely impact the school district's facilities beyond current enrollment capacity.

The school district is currently constructing a second high school in the Oakley area. This school will assist in accommodating enrollment growth from new residential development, including development contained in Future Urbanization Area #2. However, based on the amount of new development planned within the district's service boundary, a third high school is planned. 4B

Mitigation of Adverse Impacts: Both school district's are building and planning to build additional school facilities as a result of new residential development. Each school district is pursuing a combination of funding sources, including the State Building Program and local General Obligation Measures. These sources are not sufficient to fund current construction or the new school facilities that are needed. Due to this situation these school districts, along with the other three elementary feeder school districts to the high school district, negotiated a East Contra Costa County School Facilities Funding and Mitigation Agreement. This agreement provides full mitigation of the adverse impacts new residential development causes to each school district. The agreement also provides the developer options for mitigation. The base mitigation amount, based on size of unit and when the developer signs the agreement, is $4,737 per unit for the high school district and $8,287 per unit for the elementary school district, or a total of $13,024 per unit. 4C

The Liberty Union High School District and the Brentwood Union School District request that new residential development within Future Urbanization Area #2 be conditioned to join the East Contra Costa County School Facilities Funding and Mitigation Agreement. Without such a condition the adverse impact this new residential development will have on each school district can not be mitigated to an insignificant level.

Please let me know if you have any questions regarding this information and request.

Sincerely,

Laird Neuhart

cc: Doug Adams, Brentwood Union School District
Dan Smith, Liberty Union High School District
Victor Carniglia, City of Antioch

Responses to Communication 4 (Land Planning Consultants)

4A The corrections indicated are hereby made and shown in the table below. Numbers in boldface indicate changed student yield rates and yields for the Liberty Union High School District. Subtotal and total student yields which were also corrected are shown in boldface as well.

Table 26

Estimated Student Yields from Development of the Specific Plan Area

	Total	AUSD		Brentwood		Liberty	
Housing Units	1,322	661		661		661	
Student Count		*per Household*	*Total*	*per Household*	*Total*	*per Household*	*Total*
Elementary	528	0.45	297	0.35	231	**0**	**0**
Middle	211	0.17	112	0.15	99	**0**	**0**
High	**212**	0.13	86	0.00	0	**0.19**	**126**
Total	**951**	0.75	495	0.50	330	**0.19**	**126**

4B Comment noted.

4C Comment noted. Mitigation Measures H3c and H3d (p. 121) are hereby amended as follows:

H3c Require the portions of FUA #2 that are within the BUESD to join the existing ~~development agreement~~ East Contra Costa County School Facilities Funding and Mitigation Agreement with the school district or provide an alternate funding mechanism for construction of elementary and middle school facilities.

H3d Require the portions of FUA #2 that are within the LUHSD to ~~provide a funding mechanism for construction of high school facilities~~ join the existing East Contra Costa County School Facilities Funding and Mitigation Agreement with the school district or provide an alternative funding mechanism for construction of high school facilities.

Contra Costa County
FLOOD CONTROL
& Water Conservation District

J. Michael Walford
ex officio Chief Engineer

Milton F. Kubicek, Deputy Chief
255 Glacier Drive, Martinez, CA 94553-48
Telephone: (510) 313-2000
FAX: (510) 313-2333

October 20, 1995

Victor Carniglia
City of Antioch
Community Development Department
3rd and H Streets
Antioch, CA 94509

File: 97-56

Dear Mr. Carniglia:

We have reviewed the Draft Environmental Impact Report for Future Urbanization Area (FUA) #2 Specific Plan and submit the following comments:

1. On December 10, 1993, the District submitted comments on the Notice of Preparation stating our concerns about the potential impacts of the proposed land use changes in FUA #2 to the facilities of Drainage Areas 56 and 30C. We also commented that the DEIR should address the right of way cost sharing for the proposed joint use facilities. It appears that those issues were not addressed in the DEIR. A copy of our December 10, 1993 letter is enclosed for your reference. 5A

2. Pages S-14, S-15 and 103, Mitigation Measure F2; 5B

   The fourth sentence of the paragraph requires the District to process a Conditional Letter Of Map Revision (CLOMR) with FEMA once the District accepts a ultimate drainage improvement plan. Because the necessary improvements are extensive in nature, and we anticipate they will not take place all at once, the District would not be willing to file a CLOMR with FEMA. Once the ultimate improvements to the channel and the basin are completed, the District would be willing to work with the City to have FEMA revise the flood maps.

3. Pages S-15 and 103, Mitigation Measure F3; 5C

   We believe this mitigation measure needs to be revised to be more specific as to the timing/phasing of the ultimate flood control improvements. We recommend this section be amended to include the following requirements:

   A. Prior to approval of 20% of the residential lots which drain south and south easterly into East Antioch Creek, complete the realignment and ultimate up sizing of East Antioch Creek from the western boundary of FUA #2 downstream to the easterly boundary of the Delta Expressway Corridor.

   B. Prior to approval of 70% of the residential lots mentioned in 'A', above, [1] arrange for the dedication of the ultimate East Antioch Creek rights of way from the easterly boundary of the Delta Expressway Corridor to the Lindsey Detention Basin, and [2] provide alternative legal access to the other parcels in FUA #2 west of the Delta Expressway Corridor to eliminate the need for access across the above creek rights of way.

C. Prior to approval of 50% of the residential lots which drain north easterly into East Antioch Creek, pay the incremental costs for relocating the existing improved channel, from the Delta Expressway Corridor to the Lindsey Detention Basin, to its new location.

D. Prior to any development east of the Delta Expressway Corridor, [1] construct the ultimate East Antioch Creek improvements from the Delta Expressway Corridor to the Lindsey Detention Basin if they have not already been constructed, and [2] require development east of the Delta Expressway to pay 50% of the anticipated Drainage Area 56 fees. Said fees will be allocated to downstream improvements north and west of Highway 4/160.

4. Figures 36 and 37, Land Use Plans for Alternative 2 and Alternative 3, pages 178 and 183

5D

The proposed alignment for Sunset Drive through the District's right of way for Lindsey Basin shown on these two alternatives is not acceptable. The proposed alignment, as shown on the Land Use Plans, will encroach into the area required for the basin. To avoid this encroachment, Sunset Drive, within our right of way, should be aligned adjacent and parallel to the SPRR right of way similar to the alignment of Sunset Drive shown on the Land Use Plan for Alternative 4, Figure 38 on page 185.

5. Figure 38, Land Use Plan for Alternative 4, page 185

5E

The alignment of East Antioch Creek shown on this Land Use Plan is not acceptable. This plan shows East Antioch Creek situated on the west side of the proposed expressway. Because of the hilly terrain west of the expressway, the proposed location of East Antioch Creek on the west side would be extremely difficult and costly since it would require the excavation of the hills to relocate the creek.

6. Figures 36, 37 and 38 - Land Use Plan for Alternatives 2,3, and 4, pages 178,183 and 185

As we understand it, the most current Specific Plan for FUA #2, shows the District property on the north side of Laurel Road designated as E_BC_R (Business Park - Commercial) and not E_B (Business Park) as shown on these 3 figures. The figures should be revised to show the most current information. We were also informed that the most current Specific Plan shows the parcel on the northeast corner of Lone Tree Way and the proposed Delta Expressway has the E_BC_R land use designation instead of C_R designation. Again, the figures should be revised accordingly. The two parcels that we are referring to are highlighted on the enclosed copy of Figure 38.

5F

5G

The DEIR is also being reviewed by our environmental specialist and we will send her comments to you when they become available.

We appreciate the opportunity to review documents which involve drainage matters and welcome continued coordination.

Please call Mario Consolacion or at 313-2257 if you have any questions.

Very truly yours,

Tom Williams

Tom Williams
Associate Civil Engineer
Flood Control Engineering

TW/MC:mg
g:\fldctl\work\carnig.t9
Enclosures

c: M. Kubicek, Deputy
P. Harrington, Flood Control Engineering
M. Morton, Flood Control Engineering
P. Detjens, Flood Control Engineering
V. Germany Design Eng.
Roberta Mundie, Mundie & Associates
3452 Sacramento Street
San Francisco, CA 94118

Contra Costa County
FLOOD CONTROL
& Water Conservation District

J. Michael Walford
ex officio Chief Engineer

Milton F. Kubicek, Deputy Chief
255 Glacier Drive, Martinez, CA 94553-4897
Telephone: (415) 313-2000
FAX: (415) 313-2333

December 2, 1993

Mundie & Associates
Environmental Coordinator
3452 Sacramento Street
San Francisco, CA 94118

Ref: Specific Plan for Future Urbanization Area #2

Dear Ms. Mundie:

This is in response to your Notice of Preparation of a Draft Environmental Impact Report for Specific Plan for Future Urban Area (FUA) #2. We have identified two issues needing consideration regarding District lands and future facilities. The first issue is the proposed land use for one of the District's future surplus parcels. The Flood Control District owns 105 acres within FUA #2. Some of this land, approximately 40 acres, will be surplus after the excavation material for the Lindsey Basin has been placed and compacted. Enclosed is a plan showing the future surplus parcels located east of the proposed Delta Expressway. Of particular concern is the parcel bounded by the Contra Costa Canal, Delta Expressway, the proposed Laurel Road, and the proposed Sunset Road. Laurel Road is planed to be a six lane limited access road providing the major access to the Expressway for the northeastern part of East County. The "Draft Program Environmental Impact Report, FUA # 1 and #2 Infrastructure Plan" indicates that the projected year 2000 traffic volume on Laurel Road (east) is over twice the volume projected for Lone Tree Way (east). In addition, the site also fronts the proposed Sunset Road which is expected to be one of the major accesses to the ultimate terminus of the Bay Area Rapid Transit line for East County.

Based on this parcel's location, we believe it warrants a commercial land use designation. The parcels central location, adjacent to the Expressway interchange, is ideal for providing commercial type services for motorists using Laurel Road as their route from home to Expressway and vice-versa. There is a need for commercial service on the Laurel Road corridor. Based on traffic volumes, the best location for these services is just east of the Expressway. We would appreciate you giving this request consideration in your future planning activities for future Urban Area #2.

The second issue is the location of the future creek upstream of Lindsey Basin. Land Use Scenarios #1 and #2 show the creek located on the west side of the Delta Expressway. From a public use stand point, locating the creek west of the Expressway is preferred; however, due to existing topography, a significant amount of grading will have to occur. The resultant cut slops may not be visually acceptable and they may preclude access to the creek corridor from the residential properties to the

west. We strongly recommend that a detail grading plan be prepared showing the Expressway, creek corridor, proposed frontage road, cut slopes, and access roads off the frontage road that serve the proposed residential lots. The acceptability of the slopes should be determined as a part of the Specific Plan adoption. Also a part of this issue is the pedestrian connections to the land on the east side of the Expressway. What type of facility will be used to make the connections? What are the strengths and weakness of each type from a public safety standpoint? How will the connection facility conform vertically with the creek and the Expressway?

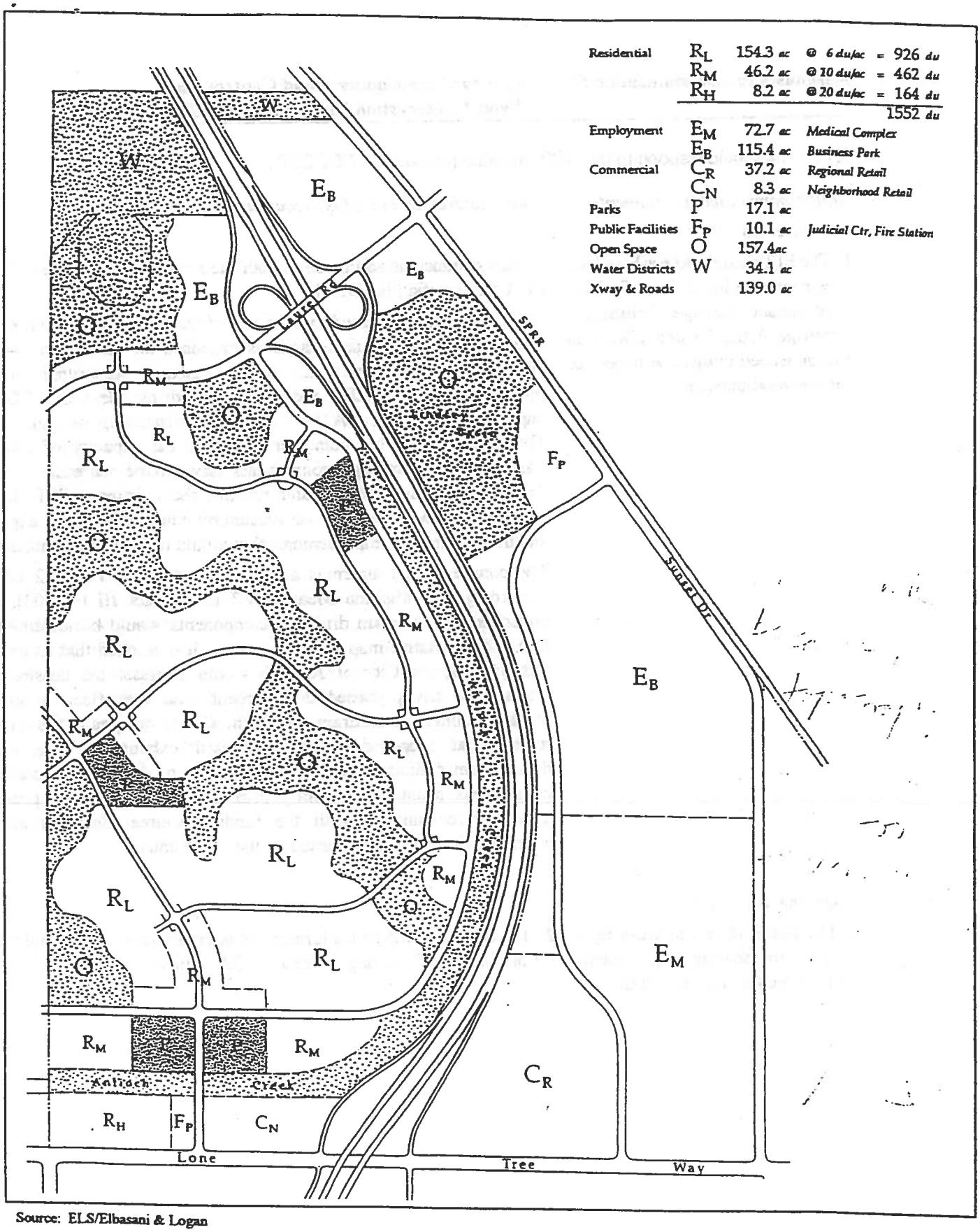
The creek location issue needs to be resolved quickly as the Contra Costa Water District has started securing right of way for their Los Vaqueros pipe line.

Very truly yours,

Milton F. Kubicek
Deputy Public Works Director

MFK:lv
c:mundie.t12
enclosure

cc: V. Carnigilia, City of Antioch
File: 3056-00



Source: ELS/Elbasani & Logan

Figure 38

Land Use Plan for Alternative 4: Higher Density Residential Emphasis

Responses to Communication 5 **(Contra Costa County Flood Control and Water Conservation District – CCCFCD)**

5A The should respond to the NOP direction provided by CCCCFD.

NOP comment letter/comment	*Where addressed in CEQA documents*
December 10, 1993:	
1. The EIR should address how land uses proposed in the Specific Plan may impact drainage facilities in Drainage Areas 56 and 30C, and recommended mitigation measures for potential impacts.	1. This comment is addressed in both the *Infrastructure Plan* EIR and FUA #2 Specific Plan DEIR. The commenter is referred to page 123 of the *Infrastructure Plan* EIR where stormwater drainage facilities proposed for the eastern portion of the Specific Plan area are discussed. According to the *Infrastructure Plan* EIR, the fee specified by the CCCFCD for improvements within DA 56 "may vary depending on land use." Therefore, if, as the commenter suggests, the capacity of Lindsey Basin or other drainage components have to be increased due to denser development and greater run-off, the existing CCCFCD fee policy for DA 56 includes a mechanism by which fees can be adjusted and used to provide improvements that would mitigate these impacts. The commenter's concern is also addressed in the FUA #2 DEIR. According to Mitigation Measure F3 in Chapter III (p. 103), any undersized downstream drainage components would be identified as part of the tentative map review process. It is implied that as part of this process, the City of Antioch would consider the density and intensity of any proposed development, and the effects proposed projects could have on drainage. If the City concludes at the time of review that proposed development will exhaust or overburden downstream drainage capacity, the redesign of downstream drainage components could be necessary prior to approval. This possible action, in conjunction with the funding source identified above, addresses the concern expressed by the commenter.
December 10, 1993:	
2. The DEIR should address right of way cost sharing requirements for proposed joint use facilities.	2. The Specific Plan text addresses financing issues in the implementation chapter. Financing is not a CEQA issue.

December 2, 1993:

1. Lands in the Specific Plan area that are bordered by the Contra Costa Canal to the north, the State Route 4 Bypass to the west, the proposed alignment of Laurel Road to the south and Sunset Drive to the east are owned by CCCFCD, which recommends that these lands be designated for commercial use.

1. The Preferred Plan Alternative, shown in Figure 3 (p. 6) of the DEIR, designates the District's property as "Regional Retail and Employment" which is consistent with the District's recommendation.

December 2, 1993:

2. With respect to NOP land use scenarios #1 and #2, the District is concerned about the amount of grading that would be necessary to align the creek on the west side of the proposed Bypass, the types of facilities that would be necessary to provide pedestrian access to the east side of the Bypass, the safety of such facilities and the manner in which these facilities will conform vertically with the creek and Bypass.

2. The location of Antioch Creek on the west side of the proposed State Route 4 Bypass as shown in "Land Use Scenarios #1 and #2." Specifically, the District is concerned with The commenter should note that the Preferred Plan Alternative, as shown in Figure 3 (p. 6) of the DEIR, indicates that Antioch Creek would run along the east side, not the west side, of the proposed State Route 4 Bypass.

5B Comment noted. The commenter should refer to Response 7C below.

5C Comment noted. The District's comments have been used to frame the implementation section of the FUA #2 Specific Plan.

5D This FEIR notes that, as a landowner in FUA #2, the Contra Costa County Flood Control District expresses its concern about the future use of lands it owns. The District's comments appear to reflect a misimpression that Alternatives 2, 3 and 4 in DEIR Chapter VI, which do not conform in some respects to the District's objectives, have equal standing with the Specific Plan as shown in Chapter II, Figure 3. The Specific Plan shown in Figure 3 represents the preferred plan at the time the DEIR was prepared.

5E Comment noted. See response 5D above.

5F Comment noted. See response 5D above.

5G Comment noted. See response 5D above.

COMMUNICATION 6 OCT 25 1995

Contra Costa County

Public Works Department

255 Glacier Drive
Martinez, California 94553-4897
FAX: (510) 313-2333
Telephone: (510) 313-2000

October 19, 1995

J. Michael Walford
Public Works Direc

Milton F. Kubicek
Deputy - Engineering

Patricia R. McNamee
Deputy - Operations

Maurice M. Shiu
Deputy - Transportati

S. Clifford Hansen
Deputy - Administrati

Ms Roberta Mundie
Mundie & Associates
3452 Sacramento Street
San Francisco, CA 94118

RE: Future Urbanization Area
Draft Environmental Impact Report

Dear Ms. Mundie:

We have reviewed the Future Urbanization Area #2 Draft Environmental Impact Report and have the following comments:

The proposed Country Hills Drive connection to Laurel Road must not be located less than 122 meters (400 feet) from the interchange ramp. If located closer it will have a significant impact on the operation of the interchange. The DEIR should include a general statement to that effect.

The State Route 4 Bypass is a limited access highway, and local circulation needs between the east side and the west side of the Bypass should be addressed, and the DEIR should recommend the appropriate mitigation.

Figures showing local traffic volumes does not include the volumes for roads in the Oakley/Bethel Island area. Tables 11 and 12 indicate that peak hour trip distribution to Oakley/Bethel Island will be as high as 12.5% of project traffic, and as such may have a significant impact on the local roads in these areas and especially on Cypress Road and Bethel Island Road when proposed developments occur along the Cypress Road Corridor area. The traffic analysis should, therefore, include the impacts, if any, on the local roads in the Oakley/Bethel Island area. The analysis should provide LOS findings not only for the impacted intersections but also for various road segments between intersections. If no significant impacts will result, the DEIR should clearly say so.

Intersection No. 35 - Has the analysis for this intersection considered the effect of the railroad crossing at this location? A future multi-lane Laurel Road may require an overcrossing, and if so, how will this affect intersection LOS performance at this location?

Very truly yours

Lowell Tunison
Senior Civil Engineer
Transportation Engineering

LT:FL:eh
g:\transeng\fl\fua2deir.t10

cc: M. Shiu, Deputy Public Works Director
J. Bueren, Assistant Public Works Director, Transportation

Responses to Communication 6 (Contra Costa County, Public Works Department)

6A. Country Hills Drive is proposed to connect with Laurel Road as part of a four-way intersection with the SR 4 Bypass southbound offramp resulting in a 0 foot offset. The separation between this intersection and the eastbound to southbound SR 4 Bypass onramp is less than 100 feet (see DEIR Figure 3, p. 6). The Caltrans Highway Design Manual (Section 504.3 (2)) indicates that the minimum between ramp intersections and local road intersections shall be 125 meters. It also says that "whenever it becomes necessary to locate a ramp terminal close to an intersection, the District Traffic Branch should be consulted regarding the requirement for signing, delineation, and signal phasing." The eastbound to southbound onramp would not be expected to adversely impact traffic operations at the signalized intersection of Country Hills Drive with the SR 4 Bypass southbound offramp. Furthermore, the traffic consultant's analysis indicates that the intersection of Country Hills Drive with the SR 4 Bypass southbound offramp would operate at acceptable levels of service for all scenarios. It would therefore be appropriate to consult with Caltrans and County staff during the design phase of this interchange.

6B. Laurel Road and Lone Tree Way would provide access between the east and west sides of the FUA #2 development (across the SR 4 Bypass). Signalized diamond interchanges would be provided where these roads intersect the SR 4 Bypass. No other roadway connections between the east and west sides of the project are planned. Because the SR 4 Bypass interchanges at Laurel Road and Lone Tree Way are projected to operate at acceptable conditions in all future scenarios, these connections would be adequate to serve east-west project traffic across the SR 4 Bypass, and no mitigations are needed.

6C. Four intersections on Laurel Road were analyzed for the DEIR:

- Laurel/Neroly
- Laurel/Empire
- Laurel/O'Hara
- Laurel/SR 4

Analysis results at these locations are an indication of traffic impacts in the Oakley area because Laurel Road is projected to be one of the most heavily used roadways in this area.

The level of service results presented in the DEIR for the intersection of Laurel/Neroly were found to be incorrect. The correct results are presented in the Table 36 below. This location would require signalization as a result of future traffic volumes. Signalization would be required for the Year 2005 without Project (Near Term) scenario (meets peak hour signal warrants). This intersection would operate at acceptable levels (level of service C or better) for all scenarios assuming planned roadway improvements and signalization.

Mitigation Measure B4 (p. 61) is hereby amended to add:

Intersection B 4 f: Laurel/Neroly (24 %)

Table 36
Laurel Road/Neroly Road Intersection Level of Service Results (Signalized)

	Year 2005 Near Term (Recent Trends)		Year 2010 Long Term (East County Model Forecast)	
	No Project	With Project	No Project	With Project
AM Peak				
Volume to Capacity Ratio	0.59	0.68	0.67	0.70
Level of Service	A	B	B	C
PM Peak				
Volume to Capacity Ratio	0.64	0.70	0.58	0.68
Level of Service	B	C	A	B

Source: DKS Associates

Table 37 shows projected AM and PM peak hour two-way traffic volumes on Cypress Road east of the planned Cypress-Laurel connector (assumed in 2010). The project would generate little or no increase in traffic volumes over the No Project condition for all scenarios. The projected level of traffic on Cypress Road (maximum of 1,400 two-way vehicles per hour) would not require more than one travel lane in each direction. Bethel Island Road would experience about the same level of traffic impacts as Cypress Road, therefore not requiring mitigation.

Table 37
Roadway Volumes on Cypress Road

Two-way volumes east of Cypress-Laurel connector (assumed for 2010 only)

	Year 2005 Near Term (Recent Trends)			Year 2010 Long Term (Recent Trends)			Year 2010 Long Term (East County Model Forecast)		
	No Project	With Project	Difference	No Project	With Project	Difference	No Project	With Project	Difference
AM Peak	852	860	+8	816	506	(-310)	1240	1174	(-66)
PM Peak	982	972	(-10)	968	564	(-404)	1395	1336	(-59)

Source: DKS Associates

6D. Laurel Avenue would cross the SP railroad tracks as an overcrossing (see Project Description, DEIR p. 9 and Figure 27, DEIR p. 123). Level of service performance would not change from the results presented in the DEIR as long as needed turn lanes are provided, e.g. the intersection of Laurel/ Sunset would require two southbound approach left turn lanes in Phase I. The need for these lanes would require that the overcrossing be designed for the required width. If additional turn lanes are not provided, vehicle queuing and stacking may extend beyond turn pockets causing vehicle congestion and possible conflicts with traffic at adjacent intersections (Laurel/Neroly).

Community Development Department
County Administration Building
651 Pine Street
4th Floor, North Wing
Martinez, California 94553-0095

Phone:
646-2034

COMMUNICATION 7

Contra Costa County

Harvey E. Bragdon
Director of Community Development

RECEIVED
OCT 24 1995
CITY OF ANTIOCH
COMMUNITY DEVELOPMENT

October 19, 1995

Mr. Victor Carniglia
City of Antioch
Community Development Department
212 H Street
Antioch, CA 94509-0504

Dear Victor,

Thank you for the opportunity to review the Draft Environmental Impact Report for the Future Urbanization Area #2 Specific Plan. I found the document to be informative and useful. I do, however, have a few comments to make.

First, I'm not sure that the conversion of over a square mile of land from agriculture to suburban uses can correctly be determined to have a less than significant impact under CEQA. While it is correct that the City's, and the County's General Plan for that matter, anticipate this area to develop, the change would generally be considered significant. Because an area is planned for growth does not change the environmental impacts of the evolution. More properly it would appear to be a significant unavoidable impact of the project. This is especially true given that page indicates FUA #2 "as either prime farmland, farmland of statewide significance, or farmland of local importance." 7A

The major concern I had with the DEIR focuses on the jobs-housing balance and phasing of planned development. The implications of this are the houses come first, and the jobs come later, furthering in the short term the jobs-housing imbalance. If these assumptions are correct, it would be desirable to modify Mitigation Measure F2 to require expediting 100 year flood zone capacity to be done in conjunction with the first construction projects in FUA #2 area. On page 31, the phasing discussion shows all the homes to be built within phase 1 and along with some commercial or office uses. My concern is that Mitigation Measure F2 on page 103 suggests deferring "development in the 100-year flood zone until capacity improvements have been provided for". The DEIR does not provide assurances that all the needed flood facilities will be provided in the short term (see second paragraph on page 98). You also might wish to require construction of some employment projects prior to allowing the residential projects in the project to proceed. Such measures would help the jobs-housing balance of the area. 7B 7C 7B

County staff is becoming more conservative lately on the issue of EMF. Several recent European studies have found health linkages due to proximity to EMF sources. On a more practical note, given real estate disclosure issues, homes located near transmission lines can have lower property values and can be much harder to sell. Considering additional setbacks as an alternative to Mitigation Measure G2, might be appropriate. 7D

The discussion of school services starting on page 118 treats the existing school district boundaries as a given; that's too bad. Review of Specific Plan Land Uses on Figure 3 implies the benefit of having the plan area entirely within one school district, especially given the location of the new school site on this map. While possibly not a significant impact, the Final EIR might encourage Antioch, the two school districts and County Superintendent of Schools Office to review the existing school boundaries to see if they are appropriate given the Specific Plan land use configurations. 7E

Page 122 indicates that 175 acres of the area remain within the East Contra Costa Irrigation District (ECCID). Once again while not environmentally significant, the Final EIR could discuss Specific Plan provisions to require detachment from ECCID when the area develops and receives potable water from the City. 7F

On page 7, the Draft EIR indicates that the Specific Plan may have too much land designated for commercial usage. That statement appears very supportable given the overbuilding of commercial properties throughout the United States. The Final EIR should explore alternative uses (or plan designations) for the retail sites. This is especially true given the statement on that same page which reads "it is unlikely that both of these sites would be developed for this use". The Final EIR might explore the advantages of one site over the other, so that the one with the best locational advantages might be selected. 7G

I hope these comments are helpful.

Sincerely yours,

Patrick Roche

James W. Cutler for
Assistant Director,
Comprehensive Planning

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c:diandocs\deir-ant.ltr

Responses to Communication 7 (Contra Costa County, Community Development Department)

7A Comment noted. See response to comments 2A and 2D.

7B The comment points out that, as noted in response 11D, the Specific Plan does not require that non-residential development be phased in tandem with residential development. To do so might impede the pace of overall development because the two types of uses, while both market driven, do not necessarily respond to similar markets or market forces. If one type of development precedes the other by a substantial amount of time, the jobs/housing balance benefits of the project will be slower to be realized, which is another way of saying that an imbalance will exist over the period of time that one type of development outpaces the other.

7C Comment noted. The following amendment to Mitigation Measure F2 responds to both comments 7C and 5B above:

> Prior to development of the areas designated as within the 100-year flood zone, improvements to the East Antioch Creek channel and Lindsey Basin shall be made ~~that would increase the capacities of these drainage system components to allow conveyance and/or storage of the~~ as needed to provide the necessary capacity to convey and/or hold 100-year flows. The City of Antioch and landowners within the Specific Plan area shall be active participants in the phasing and implementation of these improvements. The design and construction of the improvements shall be the responsibility of the Contra Costa County Flood Control District (CCCFCD) in tandem with the developer(s) of projects within these areas. The design shall consider total buildout of the planning area and all cumulative projects which drain to East Antioch Creek and potential downstream flooding effects. When CCCFCD has accepted a design for improvements, the District shall request a Conditional Letter of Map Revision from FEMA. Upon approval by FEMA, the developer will work with CCCFCD to obtain necessary authorizations, permits and financing to implement the flood protection improvements.

7D The lack of consensus among the scientific community and the absence of direction from the State of California for setback requirements from transmission lines for uses other than schools make it premature for an individual city to impose such requirements.

7E The comment notes the possible benefit of "having the plan area entirely within one school district, especially given the location of the new school site on this map." However, as the commenter concedes, this is not a CEQA issue.

7F The comment notes that "the Final EIR could discuss Specific Plan provisions to require detachment from ECCID when the area develops and receives portable water from the City." This comment does not raise a CEQA issue.

7G The commenter is referred to Chapter VI (p. 174) in which Specific Plan alternatives are discussed.

COMMUNICATION 8

CITY OF BRENTWOOD

RECEIVED
OCT 26 1995
CITY OF ANTIOCH
BUILDING DEPARTMENT

October 19, 1995

Mr. Victor Carniglia
CITY OF ANTIOCH
P. O. Box 130
Antioch, California 94509

Subject: **DRAFT ENVIRONMENTAL IMPACT REPORT**
FUTURE URBANIZATION AREA #2
SPECIFIC PLAN - SCH # 93-111069

Dear Victor:

Thank you for the opportunity to review this Draft Environmental Impact Report. As you are aware, this proposed project abuts the western portion of Brentwood's Sphere of Influence and we have several concerns that we feel were not adequately addressed in the Future Urbanization Area # 2 EIR. These concerns are as follows:

1. Economic Impacts associated with proposed businesses/commercial uses for this area and the potential economic impacts to Brentwood's future business/commercial uses in the area (planned for in our 1993 General Plan. 8A

2. While the portion of Brentwood's Sphere that abuts the Antioch Planning Area was considered for development in our 1993 General Plan, development of this area is not considered immanent. We have concerns regarding the potential growth-inducing impacts of large scale development of FAU # 2 on potential early development of adjacent areas in Brentwood. 8B

3. We have several large scale developments that are in the planning and approval process in the general vicinity of this project. The Cumulative Impacts that are discussed in this document assume development patterns and potential land uses that may not be synchronized with those referenced in the EIR document. Taken as a whole, Antioch's and Brentwood's projects could create significant impacts in the immediate future which were neither considered in the document nor planned for. In instances where either agency proposes a project which abuts the other agency, it would be beneficial to discuss significant impacts associated with mutual development. 8C

City Hall - 708 Third Street, Brentwood, California 94513-1396
Administration Offices - (510) 634-6900 • Planning - (510) 634-6905
Public Works - (510) 634-6920 • Building - (510) 634-6906 • Fax - (510) 634-6930
Police Department - 500 Chestnut Street, Brentwood, CA 94513-1377 • (510) 634-6911 • Fax - (510) 634-6919

We would be pleased to provide any information regarding projects in process while you are preparing the Final EIR. This information could then be reviewed and assessed in that document. We look forward to working with you and your consultant regarding these issues.

Sincerely,

Eddie Peabody, Jr.
Director of Community Development

EEP/map

cc: Jay Corey

Responses to Communication 8 (City of Brentwood)

8A Economic issues associated with a project are not a CEQA issue.

8B The commenter expresses a concern regarding the potential growth inducing impacts of large scale development that may effect potential development in areas adjacent to the City of Brentwood.

Development under the Specific Plan that is adjacent to the City of Brentwood Sphere of Influence:
According to the Specific Plan Preferred Alternative (Figure 3, DEIR p. 6), six land uses are designated along the border between the Specific Plan area and the City of Brentwood's Sphere of Influence. This border is defined by the portion of Empire Road extending approximately 0.45 miles north of Lone Tree Way and the one mile segment of Lone Tree Way extending west from the intersection with Empire Road.

Located along the west side of Empire Road, south of the Southern Pacific Railroad crossing and north of Lone Tree Way, the Preferred Alternative identifies two sites for non-residential development. At the intersection of Lone Tree Way and Empire Road, a 30-acre site is designated C_R-E or Regional Retail Employment. This area could accommodate regional serving employment uses such as banks, financial institutions and professional offices, in addition to "big box" retail centers or shopping centers. North of the C_R-E site, lies approximately 30 acres designated E or Employment. Similar employment-related uses to those allowed under the C_R-E category would be allowed at this site.

Approximately 0.22 miles west of the Empire Road intersection along Lone Tree Way, the Preferred Alternative designates 33 acres as C_R or Regional Retail. This site could have regional-serving commercial uses such as "big box" retail or shopping centers, which could be developed with over 500,000 square feet of building space. Immediately west of the proposed State Route 4 Bypass on the north side of Lone Tree way lies a site designated C_N or Community Retail. This designation would allow uses such as supermarkets, drug stores, restaurants and similar locally-oriented outlets on the eight acre site. Across the proposed alignment of Canada Valley Road, west of the site designated as C_N, the Preferred Alternative designates nearly six acres as R_H or Medium High Density Residential. Housing density at this site would be approximately 15 units per acre. To the west of this site, a fire station is proposed for the two-acre site designated F_p (Public Facility) that occupies the southwest corner of the Specific Plan area.

Growth induction discussion:
Urban development may encourage growth by (1) extending infrastructure to a previously undeveloped area and/or providing infrastructure capacity that accommodates growth, and (2) encouraging rapid, high-intensity development that creates an expectation of other development of that type, or of a complementary type, within the local area.

With respect to the FUA #2 Specific Plan, no infrastructure extensions into Brentwood's Sphere of Influence are proposed as a part of the Specific Plan. As noted in the DEIR (p. 173), "East and south of FUA #2 lie lands within the planning area of Brentwood, which would have the responsibility of directing growth there. Antioch will not extend urban services or roads into Brentwood."

The types of development proposed under the FUA #2 Specific Plan are higher intensity than the mostly agriculturally-related uses that now exist. However, the Specific Plan is not newly proposing those uses. They are part of the adopted Antioch General Plan, which envisions this area as a future employment center for the City of Antioch. This intention on Antioch's part has been long known

and is not new with the Specific Plan. Since the development of the Specific Plan area is envisioned as a long term process, it is unlikely that any short-term growth induction consequences would occur. In any event, control over development within Brentwood is under the control of the City of Brentwood.

Antioch/Brentwood consultation on development

The cities of Antioch and Brentwood have, in recent years, consulted with each other on future development plans and policies; each city's adoption of the *Brentwood/Antioch Memorandum of Understanding* (MOU) testifies to this consultation process. The Specific Plan DEIR and the opportunity to respond to it (as Brentwood has) also represent vehicles for such consultation.

8C The commenter is referred to Chapter III, Subsection B.2.c(1) (DEIR p. 32). It should be noted that the East County Model incorporates land use assumptions (housing and employment) consistent with information provided by the Association of Bay Area Governments (ABAG) (see *Projections '90*), which in turn draws from a survey of local planning agencies regarding future development plans. The future development condition reflected in the DEIR therefore does reflect local governments' perceptions of future development likely to be approved in their jurisdictions in the coming years. Those development projects were incorporated into the land use assumptions of the East County Transportation Model as of the time it was developed. The impacts set forth in Chapter V (see Tables 32-34, DEIR pp. 162-166) do include future Brentwood projects to the extent then known.

COMMUNICATION 9

RICHARD T. LOEWKE, AICP
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October 23, 1995

Mr. Victor Carniglia
Deputy Director of Community Development
City of Antioch
Third & H Streets
Antioch, CA 94509

HAND DELIVERED

SUBJECT: Comments on Draft EIR for the FUA #2 Specific plan
(SCH #93-111069)

Dear Victor:

This letter has been prepared on behalf of Rolling Hills Ranch LLC, and Delizia Ranch LLC, owners of the 160.94 acre parcel situated at the geographic center of the planning area and referenced in Table 1 on page 4 of the document. We appreciate the opportunity to present our comments, and wish to thank City staff and your consultants for the thoroughness of your work in preparing this document, as well as the professional manner in which the environmental issues have been investigated and reported.

The following comments are intended to supplement the record, and are reflective of a very significant amount of research and analysis which has been completed on behalf of several of the major property owners working in cooperation with each other, as well as your staff. These comments are presented in order of the major topical areas, as they appear in the DEIR.

Project Description.

1. The "Summary Description of the Project" (on page S-2) provides a projection of jobs to be generated from 122 acres of property classified for "employment" uses. However, no similar projection is provided in the Summary for the significant numbers of jobs to be created as the Community Commercial, Employment Center Commercial and Regional Commercial properties develop (an additional 96.5 acres of job-generating land uses). 9A
2. Reference is made to a "9" acre park site on page S-2 (and pages 19 and 118), and "9.4" acres is listed in Table 2 (on page 7). The correct size of the park, which is to be located on the Rolling Hills Ranch site, is 8.0 acres. 9B

3. On page 5 it is noted that the "Development Review Board" provided input to this document; this should read "Design Review Board". 9C
4. On page 8 (item "h. Open Space.") it is noted that much of the ridge line running through the western portion of the planning area "would be preserved". It should be noted that between 25 and 30 acres of this area (including the most prominent hill forms) were preserved in 1994 through a recorded agreement between the Jacuzzi Family and the City. This agreement provided for the "gift" of this land to the City in order to assure its protection as open space. 9D

Transportation.

1. As noted in the Land Use section (at page 20), a total of 8,335 jobs would be produced in FUA #2, representing a ratio of 6.3 jobs for every housing unit. This is generally considered a very favorable aspect of the Plan, because (among other reasons) it means that local jobs would be made available for local residents, a large percentage of whom would otherwise be contributing to the congestion both on and at access points to Highway 4. However, the "long term" Phase II impact analysis presented in the Transportation section, apparently assigns responsibility (beginning on page 61) to FUA #2 for traffic generated by housing units to be built outside of FUA #2, which is headed for jobs within FUA #2. Much of this traffic would be using the same streets and intersections in route to Highway 4, even if no jobs existed in FUA #2. 9E

   Using future Lone Tree Valley development as an example, many future residents of this area might travel north on Deer Valley Road or Dallas Ranch Road and proceed east on Lone Tree Way, in order to access the SR4BP in route to a job outside the planning area. It is therefore unreasonable to assign responsibility to FUA #2 for improvements to the Deer Valley/Lone Tree or Dallas Ranch/Lone Tree intersections (mitigation items B1c, B2c, B6e, B7b, B7c, etc.), necessary solely to accommodate these commute hour trips which would occur regardless of FUA #2 development.
2. Although the analysis in Section III.B.3 (beginning at page 60) attempts to assign a percentage responsibility for designated mitigation measures to FUA #2, no indication of this break-down is given in the extensive Summary section (pages S-5 through 10). As an example, while FUA #2 traffic might have a very small (clearly less than significant) impact on the Deer Valley/Sand Creek intersection, the requirement for improvements to this future intersection are assigned as a "project" mitigation measure (item B7c on page S-8). The point is that future development in FUA #2 should be held responsible for implementation of mitigation measures, in proportion to the actual impact caused. Other developments outside of FUA #2 (both in 9F

Antioch, Brentwood and the County) should assigned responsibility for the balance of such improvements. The Summary section (which is often first read) provides no such indication of proportional responsibility. Given the relatively small size of FUA #2 (in relation to other development used as input to the traffic model), FUA #2's share is far less than one would assume from reading the Summary section.

Noise.

1. A discussion of noise impacts associated with the planned construction of the Highway 4 Bypass (SR4BP) is presented beginning on page 76 of the document (Item D-2). We do not take issue with the analysis or its conclusions concerning potential impacts, and the appropriate use of noise buffers as mitigation. However, we wish to note that primary responsibility for mitigation of impacts associated with the Bypass project fall on that project's sponsors (i.e. the cost for construction of noise attenuation walls and suitable earth berms). In addition, it should be understood that: (a) use of "open space buffer zones" would not be realistic or practical as a mitigation measure, as they would be inconsistent with the proposed Land Use Plan, and would generate their own liability, and maintenance impacts for the City; and (b) the proposed Land Use Plan incorporates a mass grading concept calling for the construction of a large earthen berm (see detail shown in Figure 5.3h of the Plan), which serves as "self-mitigation" of any noise attenuation beyond that to be incorporated into the Bypass Authority's plans for the SR4BP project. 9G
2. While the noise contours shown in Figure 19 (at page 79) of the document provide a general sense of "worst case" noise impacts, it should be recognized that these contours do not reflect: (a) the above noted self-mitigation which is already a part of the proposed Plan; and (b) the presence of significant topography which has the effect of impeding the penetration of noise. It should therefore be recognized that the extent of further mitigation required to achieve the standards prescribed throughout this section of the document (and on page S-12), is far less than suggested. 9H

Public Services.

1. Estimates of additional police officers needed to serve the planning area are provided on page 117. These estimates project the need for between 5 and 6 additional total officers, based on a theoretical maximum 1,322 new housing units and an average household size of 2.9 persons (using a range of officers per population). This methodology is sound; however, it should be noted for future reference that preliminary development plans prepared by 9I

the major land owners in FUA #2 (and submitted to the City) suggest that the realistic maximum development yield for the planning area is approximately 1,200 units. Based on the mix of unit types and sizes mandated by the plan, it is also much more likely that combined average household sizes will be closer to 2.5 persons. Based on such "realistic" maximums, the population of the planning area would approach 3,000 people at build-out, and would generate the following actual demand: 9I (CONT.)

Staffing Ratio	Sworn Officers	Civilian Officers	Total
1.13	3.4	1	4
1.20	3.6	1	4
1.39	4.2	1	5

2. Estimated park needs are also based on population projections. The analysis on page 118 therefore suggests a greater number of park acres than is likely to be needed, based on actual development. 9J
3. Similarly, the projections for school enrollment reflect the maximum development yield theoretically possible under the Plan. Actual school enrollment, based on the maximum realistic development assessment outlined above, will be approximately 22% less. While the analysis provided in the document correctly addresses "worst case" theoretical maximum numbers as required by CEQA, these unrealistic enrollment numbers should not be used for purposes of facility planning or funding.

Infrastructure.

1. The description of sanitary sewer lines available to serve the planning area (on page 126 and in Figure 29) does not make mention of the existing line available in Vista Grande which could potentially service a portion of the west-central section of the planning area, on the Rolling Hills Ranch property (either permanently or on a temporary basis until the lines in Canada Valley Road and Lone Tree Way were completed). 9K
2. The identification of local roadways serving the planning area (beginning on page 122 and in Figure 27) incorrectly refers to "Jacuzzi Road" as a disconnected extension of Country Hills Drive, extending east and north as the SR4BP frontage road. This frontage road will be a direct extension of Country Hills Drive, and should retain its present name (see Specific Plan Figure 3.0). The name "Jacuzzi Drive" is to apply to the local residential street which is to connect Canada Valley Road and Country Hills Road in a West-to-East direction. Impact/Mitigation section bullet items should be amended accordingly. 9L

3. The widening of Lone Tree Way (which forms a common boundary between the FUA #2 planning area and other developing properties) is planned to an ultimate 6-lane capacity (as correctly outlined on pages 122 and 130). It should be noted, however, that the needed widening may be phased (both west to east, and north/south. In addition, responsibility for the southerly half of the roadway may be assigned to other developing properties (see comments on Transportation). 9M
4. Similarly, the responsibility for constructing Sunset Drive as a new 4-lane arterial (page 130) is anticipated as a shared responsibility (based on trip generation) with FUA #1, as this roadway will serve as the interim northerly connection to the Phase 1 SR4BP project (connecting just north of the CC Canal).

Vegetation and Wildlife.

1. The discussion of "Seasonal Wetlands" within the southwest portion of the planning area (on page 136) makes note of a large temporary detention basin located just off-site, built "three to four years ago". It should be noted that this basin was constructed by Shea Homes, at the direction of the City of Antioch approximately six years ago (documented aerial photographs - copy attached - show this basin as being in existence and full of water in July of 1990). It should also be noted that this basin (which can be seen in Figure 5 of the document) although designed "to temporarily collect surface runoff from the impermeable surfaces" of upland development, has actually retained water continuously over the past several years. The apparent partial blockage of a low-flow pipe at the base of the earthen dam has resulted in a small but continuous flow of impounded water southeasterly across the Rolling Hills Ranch and McBail properties. Water released from the dam has been replaced (during summer months) by piped discharges generated from the washing of cars, excess sprinkler irrigation, construction water discharge, etc. This slow but continuous release of development discharge water is responsible for the conditions described in August of this year (at page 136): "Water was observed on the FUA #2 site between 2 and 3 inches deep within the upper reaches of this drainage". As noted at the bottom of page 136, this artificial source of non-rainy season water will be significantly reduced or eliminated with the scheduled removal of the temporary basin. As a result, it is expected that the extent and duration of saturated soils will revert back to the pre-detention basin conditions reflected in the attached 1978 aerial photograph. 9N

Finally, it should also be noted that the *August 1992 Southeast Antioch Specific Plan and EIR* document that "no constraints" to the then contemplated construction of roadway improvements within the subject swale area were observed (see attached SE Specific Plan Figures 4, A-4 and 7). This is proof that conditions present at that time were not consistent with that of a "seasonal wetland". The contemplated extension of Canada Valley Road along the alignment of this swale is therefore clearly consistent with the current Southeast Specific Plan. 90

Alternatives.

1. It is noted on page 175 that the "current size" of the Lindsay Basin is "5 acres". Although this was true at the time of initiation of the document, the basin was recently enlarged by the CCCFLWCD to a much greater size. Further enlargement of the basin is still contemplated, consistent with that reflected in the document. 9P
2. It should be noted in the discussion of the "No Project" alternative, that the noise environment would not "remain in its current state" (as suggested). This is because the SR4BP project (which is the primary source of noise reflected in Figure 19) could proceed independently. 9Q
3. Table 35 (on page 179) provides a comparison of land uses for the "Proposed Project" and three alternatives. We note that of these alternatives, only the "Proposed Project" would produce any low-density single-family housing (the vast majority of residential acreage in this alternative is devoted to low density uses). The proposed project also would produce the fewest number of higher density housing units (even compared to the "Employment" and "Regional Retail" emphasis alternatives). 9R

   As outlined in Chapter III, the "Proposed Project" alternative has been "particularly attentive to the retention of the ridge as an important aesthetic feature within FUA #2". Despite this accomplishment, Table 35 shows that the "Proposed Project" would result in the fewest number of publicly maintained park and open space acres. This information speaks to both the sensitivity and efficiency of the proposed Specific plan.

Sources.

1. The firm of McGill, Martin, Self is credited at the top of page 159 for their role in preparing the EIR infrastructure analysis, but is absent from the sources list on pages 189-90. 9S

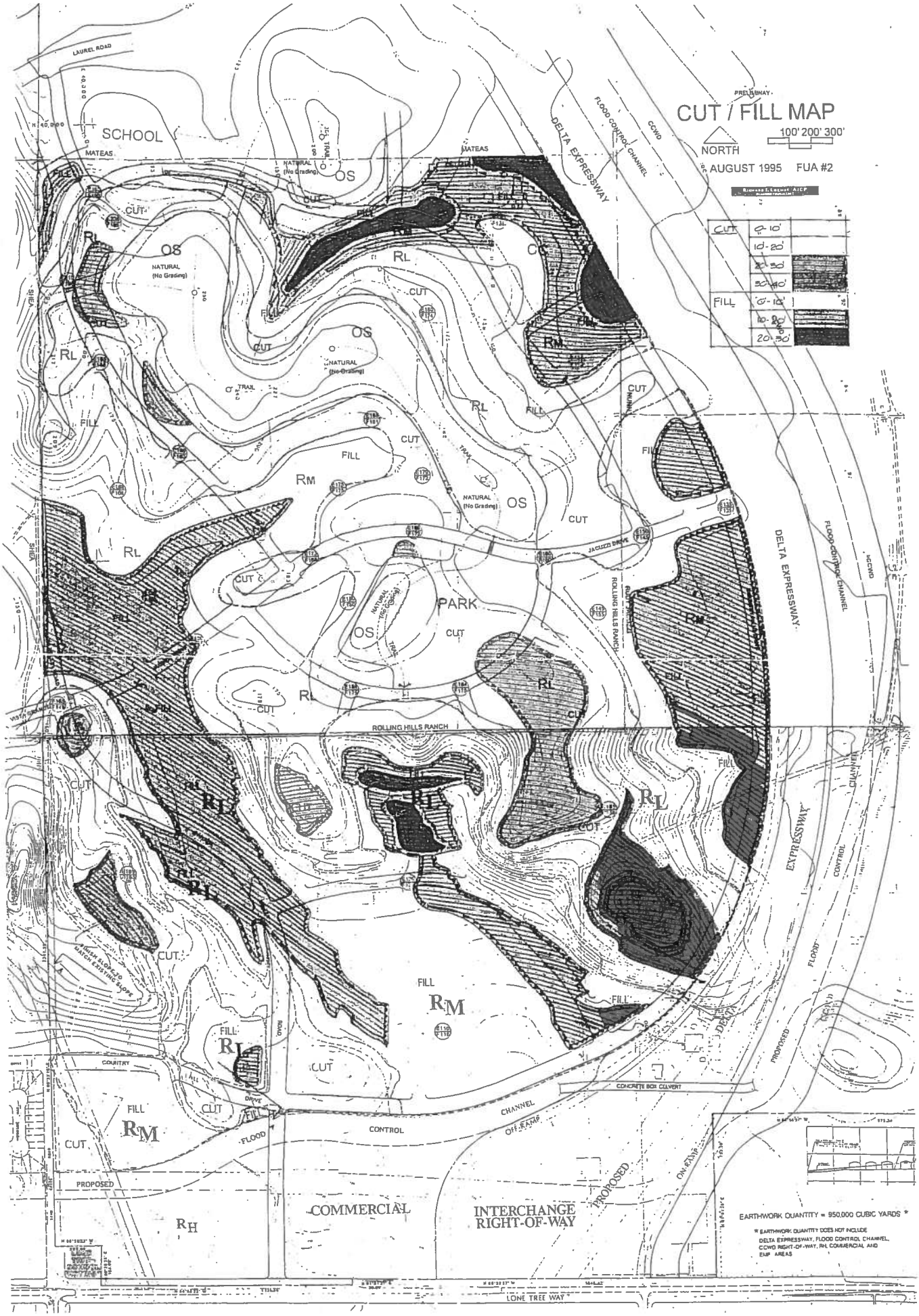
In closing, we ask that the preceding comments be incorporated into the Final EIR for the FUA #2 Specific Plan, and that appropriate corrections be made where necessary.

Sincerely,

Richard T. Loewke, AICP

enc.

cc: Remo Jacuzzi, Rolling Hills Ranch LLC
Don DeShields, Delizia Ranch LLC
Mike Gallagher, McBail Company
Mike McGill, McGill, Martin, Self


CUT / FILL MAP
100' 200' 300'
NORTH
AUGUST 1995 FUA #2
CUT
0-10'
10-20'
20-30'
30-40'
FILL
0-10'
10-20'
20-30'
SCHOOL
LAUREL ROAD
MATEAS
OS
NATURAL (No Grading)
TRAIL
RL
RM
RH
CUT
FILL
PARK
JACUZZI DRIVE
ROLLING HILLS RANCH
DELTA EXPRESSWAY
FLOOD CONTROL CHANNEL
CCWD
COMMERCIAL
INTERCHANGE RIGHT-OF-WAY
PROPOSED
CONCRETE BOX CULVERT
LONE TREE WAY
EARTHWORK QUANTITY = 950,000 CUBIC YARDS *
* EARTHWORK QUANTITY DOES NOT INCLUDE DELTA EXPRESSWAY, FLOOD CONTROL CHANNEL, CCWD RIGHT-OF-WAY, RH, COMMERCIAL AND EMP AREAS

Responses to Communication 9 (Richard T. Loewke, AICP, Planning Consultant)

9A Comment noted. The text in Chapter II, Section B (p. S-2) is hereby amended as follows:

> **Employment Uses.** The Plan contains 122 acres that would allow "employment" uses, which include office, light industrial and similar activities. The employment area is located on the relatively flatter portion of FUA #2, east of the hills and the State Route 4 Bypass alignment. Antioch could expect over 2,000,000 square feet of office and light industrial development in this area or an estimated 6,000 workers. Commercial uses located in the eastern and southern portions of the Specific Plan would also contribute approximately 2,335 workers, for a total of 8,335 employees.

9B Comment noted. The acreage change identified by the commenter represents a minor adjustment and has no effect on CEQA impacts.

9C EIR text corrected as indicated.

9D Comment noted.

9E The intersections of Lone Tree Way/Dallas Ranch Road and Lone Tree Way/Deer Valley Road would be impacted in the future by FUA #2 generated traffic as well as other development in the area, e.g. FUA #1. It is not unreasonable to assume that a portion of FUA #2 traffic would impact these intersections. The FUA #2 project would generate between 10 and 20 percent of the total traffic at these intersections (Phases I and II). The proportion of traffic at these intersections attributed to FUA #1 would be greater than the proportion attributed to FUA #2.

9F The summary description of Transportation Mitigation Measures in Chapter I (pp. S-5 to S-10) should be read in conjunction with the text of Chapter III (DEIR pp. 61 to 64), where the percentage responsibility assigned to each mitigation measure that is attributable to FUA #2 is shown.

9G Comment noted.

9H The commenter should note the full title of Figure 79: "Year 2010 CNEL Noise Contours Without Mitigation." This suggests that contours were purposefully drawn without consideration of noise mitigation effects.

With regard to the effect topography may have in impeding the penetration of noise, this would seem more plausible and applicable if hills or other significant convexities were situated between proposed residential areas and the proposed alignment of the State Route 4 Bypass. Figure 3 (DEIR p. 6) indicates that the topographic relief occupying areas anticipated for residential development demonstrates mostly positive slopes that rise to the west. This implies that residential receptors may be elevated above the noise produced by the proposed Bypass but would not necessarily be shielded as implied by the commenter.

9I Comment noted. It should be recognized that residential areas experience occupancy cycles in which average household sizes rise and fall over time. The EIR estimate of 2.9 persons per household and the commenter's estimate of 2.5 persons per household should both be considered to lie within the broader range that will be experienced in coming decades.

9J If residential buildout in the FUA #2 Specific Plan is less than the 1,322 units assumed in the DEIR, then demand for public services will be less, as commenter observes.

9K Comment noted.

9L Comment noted. The EIR is hereby amended with respect to the name "Jacuzzi Drive."

9M The commenter's concern about the phasing of improvements to Lone Tree Way and Sunset Drive are noted.

9N The temporary offsite detention basin referred to in the comment, and its effects on the Specific Plan area, are discussed in the DEIR (p. 136). The commenter's reference to the earlier CEQA review is superseded by the analysis conducted for the current EIR. Impact J1 (p. 145) reflects the potential for a seasonal wetland in the southwest corner of the project area.

9O The environmental conditions reported in this EIR are based on the most current information and field inspections of the site.

9P Comment noted.

9Q Comment noted.

9R This is a comment on the Specific Plan, not on the EIR.

9S The EIR is hereby amended to include McGill Martin Self as a source. See also the text on FEIR Preparers, p. 2 above.

Note:	This commenter submitted the grading concept map (cuts and fills) that appears on p. 47 as part of his comment.

review and comment as required by the County-wide Transportation Plan and would then go before TRANSPLAN. Commissioner Martin said TRANSPLAN members did receive notification that the draft EIR was being distributed.

A discussion began regarding Table 34 on page 165. Mr. Carniglia stated that Table 34 was based on the current configuration of the Hillcrest interchange. He would get back to the Commission with information on impacts after improvements were made to the interchange. 10A

Commissioner Petersen referred to page 26, Table 5. Mr. Carniglia indicated the numbers referred to directional flows of traffic, however he said he would check with the Traffic Engineer and get back to the Commission. Commissioner Martin noted that the State Route 4 and Somersville interchange was not included. Mr. Carniglia stated the numbers could be obtained from the traffic model and included in the report. 10B

Vice Chairperson Gibson-Gray declared the public hearing open.

Dick Loewke, Planning Consultant, representing the Ramo and Rudy Jacuzzi families, stated they were in the process of reviewing the document. They would submit detailed comments in writing to staff with the expectation that the comments would be circulated to the Commission. He noted that a lot of the traffic data dealt with what appeared to be the combined impacts of the Lone Tree Valley FUA #1 and #2 projects. The EIR was supposed to be based on traffic generation from FUA #2. He recognized that FUA #2 had to be looked at in conjunction with future cumulative growth, but said he was struggling with trying to make distinctions as to what impacts were attributable to the 1300 housing units and 6000 jobs projected in FUA #2. 10

On motion by Commissioner Martin, seconded by Commissioner Carey, the Commission **CONTINUED** the public hearing to October 4, 1995.

CONTINUED ITEMS

5. **STUDY SESSION** on Future Urbanization Area #2 (FUA #2) Specific Plan.

Mr. Carniglia reported that the study session was continued on September 6, 1995. He requested the Commission's comments on the remaining items with primary focus on the Fiscal Impact Report and the Development Agreement for FUA #2. He reported that any information or policy directions received from the City Council would be compiled and distributed to the Planning Commission. During a recent City Council study session, the Council reiterated the Commission's desire to see the employment uses as soon as possible.

During review of the Fiscal Impact Report, it was suggested the word "phase" be taken out when referring to the sequencing of development and described as the "residential only" component of the plan. Mr. Carniglia discussed sales tax revenue and stated the various retail revenues needed to be clarified. The Goal was to keep the per unit cost equivalent to the southeast area. H reported that the draft Fiscal Impact Report would be refined and come back to the Commission for further review.

The Commission reviewed the draft Development Agreement. Mr. Carniglia clarified the Agreement was preliminary. City Attorney Galstan responded to inquiry and stated that he had many comments on the agreement that would come at a future date.

Vice Chairperson Gibson-Gray opened the floor to public comment.

Dick Loewke said the Fiscal Impact Report was a very conservative analysis. All of the cost figures for residential development were low. All the development intensity figures for employment were low and revenues were therefore low. The net revenue picture after providing for services to the City was far more positive than the straight analysis would lead one to believe. He encouraged the Commission to look at sales tax revenues on pages 9 and 16. A fairly substantial number of acres would be committed to regional retail users that would draw from more than local residents. He was concerned that Mundie & Associates quantified the figure but did not incorporate it into the table that analyzed costs, revenues and impacts on the general fund. Mr. Loewke referred to the Development Plan and stated it was important, from a property owners point of view, to approach an agreement with the City so that the commitments made to each other could not be changed down the road. It was important from the standpoint of investments.

Mr. Carniglia reviewed the background of past development agreements.

Mr. Loewke responded to questions from the Commission. He said within the report there were understatements compounded upon understatements that projected revenues from the residential side that were less than they should be. He stated he would provide staff with comments and figures for evaluation.

Mike McGill, McGill Martin Self, discussed infrastructure and infrastructure financing. The Fiscal Study did not talk about the infrastructure that was needed to implement the specific plan in FUA #2 or the individual developments. The infrastructure would either be implemented through a financing vehicle such as an assessment district or mello roos district, or if the phases were small enough engineering had considered conditioning the developers to build it as they do each phase. The information in the Fiscal Study is for maintenance once the infrastructure was built.

WRITTEN COMMUNICATIONS - None

Responses to Communication 10 (Planning Commission Hearing, September 20, 1995)

10A. Level of service analysis results for the SR 4 ramps at Hillcrest Avenue intersections shown in Table 34 (DEIR p. 165) were conducted assuming two through lanes in each direction on Hillcrest Avenue, and exclusive left turn lanes. Existing conditions assumed one lane in each direction on Hillcrest Avenue at the SR 4 ramps. Additional turn lanes would be required at these intersections as noted in the mitigations (see DEIR p. 62).

10B. The existing conditions intersection level of service results presented in Table 5 (DEIR p. 26) are based on manual traffic turning movement counts conducted at each location during the AM and PM peak periods. The existing conditions operation of the SR 4 Freeway between SR 160 and Kirker Pass Road is presented in Table 7 (DEIR p. 29). The Somersville interchange is within this segment. SR 4 currently meets Traffic Service Objectives in both the AM and PM peak hours.

10C. While the DEIR identified impacts in which both the FUA #1 and #2 Specific Plans are assumed to be implemented simultaneously, the mitigation measures for each Specific Plan have been developed to indicate the share of impacts (project and cumulative) attributable to development of that Specific Plan. The mitigation measures for FUA #2 reflect the proportion of traffic attributed to FUA #2 at impacted intersections.

Mr. Carniglia responded to questions from the Commission. He clarified that the General Plan would not be amended. The application would find that the General Plan designation of service/commercial would allow the proposed use even though the underlying zoning was residential. He reported that no response was received from adjacent property owners who were noticed of the public hearing.

Chairperson Durkin declared the public hearing open.

From the audience, the applicant indicated he agreed with the staff report.

Hearing no further comments, the public hearing was closed.

On motion by Commissioner Sloan, seconded by Vice Chairperson Gibson-Gray, the Commission unanimously **APPROVED** GP-95-3, Wade Cluck.

NEW ITEM

4. Discussion with Antioch Historical Committee.

Chairperson Durkin announced that no members of the Antioch Historical Committee were present.

In response to Commission inquiry, Mr. Carniglia explained that the alignment change for the "A" Street Extension Project had not formally happened. It would come before the Commission as an amendment to the General Plan. The Antioch Historical Commission would be involved with that issue.

CONTINUED PUBLIC HEARINGS

2. **FUA #2 DRAFT EIR:** Public Hearing to receive comments on the Draft EIR for Future Urbanization Area #2.

Deputy Director Community Development Carniglia reported that the purpose of the public hearing was to receive any verbal comments on the FUA #2 Draft EIR from both the general public and Commission. The comment period would end October 23, 1995.

Mr. Carniglia responded to questions and comments from the Commission. He felt the cultural resources site on page S-21 could possibly include a little more information without pointing out the exact site location. He indicated that he would check to insure a second regional commercial area would not be in violation with the General Plan. 11A 11B

Commissioner Martin suggested staff check the page references throughout the document.

A discussion began relative to traffic impacts, regional traffic problems, the cumulative effect when considering projects in other jurisdictions, proposed improvements on Highway 4 and mitigation measures. Mr. Carniglia explained "Traffic Service Objectives" (TSO) and routes of regional significance. He noted the report indicated that Measure "C" improvements to Highway 4 would improve overall traffic flow, but the effect of FUA #2 would be slightly worsened TSO's. The mitigation outlined was paying the regional traffic fee. During discussion, some Commissioners expressed concern that there could be no money available to fully accomplish the traffic and highway improvements. 11C

Mike McGill provided information relative to traffic impacts and improvements at buildout and responded to questions from the Commission. Commissioner Lawrence expressed concern that the residential units would be built a long time before the employment centers were constructed. Vice Chairperson Gibson-Gray requested the Commission have the opportunity to analyze and evaluate the impacts during construction phasing. She referred to page S-10 B.18 and suggested the word "developing" be replaced with "implementing". 11D 11E

A discussion began regarding Antioch School District's development and funding of schools, boundary issues and public service. Mr. Carniglia responded to questions from the Commission. He reported that staff received a response letter from Antioch Unified School District concurring with the EIR. He felt it was possible that another needs or facilities study would be put together by the City working with the property owners and School District to discuss the needs and demands for school facilities within FUA #1 and FUA #2. He clarified that the City had no control over school district boundaries.

Relative to public service, it was noted that the fiscal study would need to be revised following the recent State Supreme Court order effecting the Utility Users Tax. Mr. Carniglia clarified that the General Plan should indicate a range from 1.2 to 1.5 police officers per 1,000 population ratio.

Chairperson Durkin invited public comment.

Trisha Meikle said she had questions regarding the Mello Roos District and school issues. Mr. Carniglia discussed the new Mello Roos District and referred her to the School District for further information.

Dick Loewke, Planning Consultant for the Jacuzzi Properties, informed the Commission that he was in the process of preparing written comments that would be submitted to staff before the deadline. He commented on revenue and service levels and explained the difference between Environmental Impacts and Fiscal Impacts. He stated the studies concluded that in FUA #2 residential development alone without any retail at all would cover all public service costs and the new development would pay its own way. Beyond that when employment uses come in place the City would not only begin to balance its job generation and traffic issues, but receive serious revenue replacement for the City. He encouraged the Commissioners to review the August 1994 Fiscal Impact Report

Mr. Loewke responded to questions from the Commission. He stated that the current study conducted by Roberta Mundie reaffirmed her earlier generalization that from a standpoint of real dollars coming into the City against real costs to pay for services, revenues would exceed the costs of services in FUA #2 in all circumstances under every phasing situation being considered. He stated that the EIR included a first tier analysis of soils. He reported that based on the broad indications in the EIR there was nothing in terms of soil related issues that was of any special concern to him.

Corey Simon stated that the EIR included assumptions of what would happen by the year 2010 relative to traffic improvements. One included that Highway 4 widening would be completed to 6 lanes to Hillcrest Avenue. He was concerned that funding would run out. He pointed out the critical need for the Highway 4 Bypass in FUA #2. He asked if the traffic analysis could be expanded to include "what if" the regional projects listed on page 36 were not funded. What would be the impacts off site. 11F

Vice Chairperson Gibson-Gray requested a copy of the 1994 Fiscal Study.

Hearing no further comments, Chairperson Durkin closed the public hearing.

Chairperson Durkin noted the Commission was extremely concerned about traffic, schools, police services and fiscal impacts all around. Mr. Carniglia noted that written comments could be submitted until October 23, 1995.

* Chairperson Durkin declared a 9:10 p.m. The Commission reconvened at 9:25 p.m.

CONTINUED ITEMS

5. **STUDY SESSION** on Future Urbanization Area #2 (FUA #2) Specific Plan.

Mr. Carniglia requested the Commission review the staff report submitted to the Council for the September 19, 1995 study session and minutes from that meeting. He requested comments from the Commission on the City Council study session.

The Commission discussed the City Council staff report and minutes from the meeting. Mr. Carniglia summarized Council discussion on the issues of small lots, parks and timing of development. He said it would appear the Council was concerned for the same issues as the Commission. How those issues would be resolved was still undecided.

Commissioner Petersen said he would like to look at something different than 50% of lots within FUA #2 being small and 80% in Sky Ranch.

During discussion, some Commissioners were concerned that the Council had not been informed of the Commission's past meetings and study sessions relative to FUA #2 and the direction the Commission was headed. Concern was expressed that the issues the Commission found very important were not addressed by the Council at the study session. It was felt that the Commission should have been more proactive and generated a report to the Council outlining the Commission's direction.

Mr. Carniglia stated there were no big inconsistencies between Council comments and the Commission's concerns. He clarified that the study session was not a detailed report of FUA #1 and #2, but a presentation to get the Council's opinion and direction on broad issues. He clarified that the bullet items outlined in the Council study session minutes did not represent policy direction, but were just issues that were raised. He reported that the fiscal feasibility study for the golf course in FUA #1 would be provided to the Commission when the information was received.

Commissioner Sloan referred to the land use section of the Draft Specific Plan. She asked if wording could be added that any changes in land use designations would come back to the Commission.

Chairperson Durkin commented that she felt the City was missing a large source of revenue because of the funding mechanism for the business licenses specifically professional trades.

WRITTEN COMMUNICATIONS

Chairperson Durkin acknowledged a memorandum received from Council Member Rimbault that outlined her opposition to the Commission's approval of Desert Leathers Bar and Grill on September 20, 1995.

The Commission discussed the letter. During discussion, some Commissioners felt it was the Council persons obligation to attend a meeting when an issue of personal importance was being reviewed. Some Commissioners indicated they were offended by the letter and felt there was a definite lack of communication. It was noted that the Commission's approval of the application followed consideration of all issues and testimony presented at the meeting.

Mr. Carniglia announced the approval was appealed by the Chief of Police and would go before the City Council on November 11, 1995.

COMMITTEE REPORTS

Reports from various committees: There were no committee reports.

ORAL COMMUNICATIONS

Mr. Carniglia announced that the October 18, 1995 meeting would be cancelled. The next scheduled meeting was November 1, 1995.

ADJOURNMENT

There being no further business, Chairperson Durkin adjourned the meeting at 10:15 p.m.

Respectfully submitted,

Joyce L. Baker
Minutes Clerk

Responses to Communication 11 (Planning Commission Hearing, October 4, 1995)

11A The commenter is referred to Chapter III, Subsection K.2.c. for a more detailed description of the archaeological site.

11B The adopted General Plan of the City of Antioch contains language (p. 58) supporting the continuation of the County East Mall as the regional commercial center of Antioch. This commitment is made for the planning period for the 1988 General Plan, which is to say to the year 2000. The Specific Plan for FUA #2 is looking beyond the time horizon of the current General Plan.

11C Comment noted.

11D The Specific Plan does not require that non-residential development be phased in tandem with residential development. To do so might impede the pace of overall development because the two types of uses, while both market driven, do not necessarily respond to similar markets or market forces.

11E The summary description of Mitigation Measure B18 (p. S-10) and the full description of Mitigation Measure B18 beginning on page 64 are hereby amended as follows:

Implement ~~develop~~ a detailed construction traffic plan.

11F DKS work on the East County Action Plan (Memorandum from Jeff Buxbaum, DKS Associates, to TRANSPLAN TAC, April 19, 1993) included evaluation of a scenario with 2010 land use assuming a year 2000 roadway network. The year 2000 improvements assumed for this scenario were generally limited to improvements on selected arterials. SR 4 widening and the SR 4 Bypass were not assumed. The following is a brief summary of the impacts of this scenario compared with the year 2010 land use on the 2010 roadway network (with planned improvements).

- Due to capacity restrictions, SR 4 Freeway east of Bailey Road would experience 1,500 fewer vehicles per hour. As a result, traffic volumes on parallel routes would increase:
  - Pittsburg-Antioch highway volumes increase from 2,200 to 3,000 per hour (both at LOS F)
  - Leland Avenue east of Railroad, increases from 1,400 to 1,826 vehicles per hour
  - Buchanan Road east of Railroad, increases from 870 to 1,097 vehicles per hour
- Buchanan Bypass traffic drops from 2,600 to 1,650 westbound vehicles per hour due to reduced capacity (2 lanes versus 4)
- Without the SR 4 Bypass, parallel routes south of SR 4 Freeway are impacted:
  - Hillcrest Avenue peak hour volume increases from 2,100 to 2,900. Roadway LOS increases from D and E to F (from Laurel Road north)
  - Traffic on Sunset Road extension increases by about 200 vehicles per hour
  - Traffic on Oakley Road increases from 170 to 970 vehicles per hour westbound

- Traffic on Neroly Road increases from 200 to 1,230 vehicles per hour northbound
- SR 4 traffic between downtown Oakley and Cypress Road decreases, due to reduced capacity (SR 4 not widened to 4 lanes). Traffic is routed to Cypress Road, Empire Avenue to Oakley Road/Neroly Road.
- Traffic on Balfour Road and Deer Valley Road both increase by about 500 vehicles per hour
- Traffic on Marsh Creek Road, west of Deer Valley increases by about 600 vehicles per hour
- Traffic on Cypress Road increases from 700 to 1,100 vehicles per hour
- Lone Tree Way, west of Hillcrest, has similar traffic volumes (1,700 to 1,825) but worse LOS (from A-C to F) due to reduced capacity (4 versus 6 lanes)

- Travel times for all routes are significantly increased, e.g. from Hillcrest to I-680/SR 24 travel time increases from 44 minutes to 97 minutes

State of California

The Resources Agency

COMMUNICATION 12

M E M O R A N D U M

To : Director
State Clearinghouse
Office of Planning and Research
1400 Tenth Street
Sacramento, CA; 95814

Date :10/18/95

From : Office of the Secretary

10-20-95

Subject: Agency Comments

Attached are individual comments of departments, boards, or commissions within The Resources Agency requested by your State Clearinghouse Notice of Completion and Environmental Document Form on the subject item(s). Agencies responding to your request are listed below.

Attachment(s)

Resources Date:	SCH#	Department	Comment
9 09 95	93111069	CONSERVATION	COMMENT
		FISH&GAME	NO RESPONSE
		PARKS & REC	NO RESPONSE
		STATE LANDS	NO RESPONSE

OCT 18 1995

SEP 5 1995
STATE ... OFFICE

State of California
Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

SCH #93-111069
(#2)

Project Title: Specific Plan, Future Urbanization Area #2 (FUA #2), Draft Environmental Impact Report (DEIR)

Project Location – Specific: Northwest of the intersection of Lone Tree Way and Empire Avenue

Project Location – City: Antioch **Project Location – County:** Contra Costa

Description of Nature, Purpose and Beneficiaries of Project

Project is the Specific Plan for the development of approximately 785 acres of land, presently mostly undeveloped, in residential, commercial and employment-generating land uses (approximately 244, 97 and 122 acres respectively) as well as public uses including school, park, open space, transportation and public facilities (approximately 322 acres total). Preparation of this Specific Plan accomplishes the directive of the Antioch General Plan requiring that future development in the project area not proceed until a Specific Plan is adopted. Project beneficiaries include the City of Antioch and future developers and users of project lands.

Lead Agency: City of Antioch **Division:** Community Development Dept.

Address Where Copy of EIR is Available: City of Antioch, Community Development Dept.
City Hall, 3rd and H Streets
Antioch, CA 94509

Review Period: September 5 through October 21, 1995

Contact Person: Roberta Mundie
Mundie & Associates
3452 Sacramento Street
San Francisco, CA 94118

⇦ Please send comments on the DEIR to this address.

State Clearinghouse Contact: Mr. Chris Belsky
(916) 445-0613

State Review Began: 9-5-95
Dept. Review to Agency 10-13
Agency Rev to SCH 10-18
SCH COMPLIANCE 10-20

Please note SCH Number on all Comments
93111069
Please forward late comments directly to the Lead Agency

AQMD/APCD 2 (Resources: 9/9)

Project Sent to the following State Agencies

- X Resources
- ___ Boating
- ___ Coastal Comm
- ___ Coastal Consv
- ___ Colorado Rvr Bd
- X Conservation
- X Fish & Game # 3
- ___ Forestry
- X Parks & Rec/OHP
- ___ Reclamation
- X BCDC
- ___ DWR
- ___ OES
- ___ Boat Transp Hous
- ___ Aeronautics
- ___ CHP
- X Caltrans # 4
- ___ Trans Planning
- ___ Housing & Devel
- ___ Health & Welfare
- ___ Drinking H20
- ___ Medical Waste

- ___ State/Commuter Svcs
- ___ General Services
- X Cal/EPA
- X ARB
- ___ CA Waste Mgmt Bd
- ___ SWRCB: Grants
- ___ SWRCB: Delta
- ___ SWRCB: Wtr Quality
- ___ SWRCB: Wtr Rights
- X Reg. WQCB # 2
- X DTSC/CTC
- ___ Yth/Adlt Corrections
- ___ Corrections
- ___ Independent Comm
- ___ Energy Comm
- ___ NAHC
- ___ PUC
- ___ Santa Mn Mtns
- X State Lands Comm
- ___ Tahoe Rgl Plan
- ___ Other: ___

Responses to Communication 12 (State of California, Office of Planning and Research, State Clearinghouse)

12A The communication from the State Clearinghouse indicates that the DEIR was sent by the Clearinghouse to the following State agencies:

Resources	Parks and Recreation/OHP	Air Resources Board
Conservation	BCDC	Regional Water Quality Control Board
Fish and Game	Caltrans	DTSC/CTC
State Lands Commission		

The Department of Conservation was the only State agency responding.