Environmental Impact Report

Southtown Project

State Clearinghouse Number: 2003062071

City of Vacaville

Draft

December 2003

Cotton/Bridges/Associates

A Division of P&D Consultants

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DRAFT

December 2003

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Executive Summary

Project Description

The proposed Project includes applications for General Plan Amendment, rezoning, and annexation to the City of Vacaville to accommodate approximately 1,410 housing units, 30,000 square feet of commercial space, 6.8 acres of self storage, 33.5 acres of park space, a fire station, and ~14 acres of public/civic space. The environmental analysis will consider impacts related to site preparation, construction, and occupation of each proposed land use, as well as the construction and operation of all supporting infrastructure, utilities, and services.

Project Location

The approximately 290-acre Project site is located outside of Vacaville city limits near the southeastern edge of the developed city (Figure 2-2). Leisure Town Road bisects the Project site, and separates the Southtown portion of the Project on the west from the Southtown Commons portion of the Project to the east. Nut Tree Road serves as the western boundary of the Project site, and the Union Pacific railroad tracks are located at approximately the eastern extremity. The new Alamo Creek is a northern boundary, and Opal Way is located at approximately the southern extremity. Single-family residential land uses are present north and west of the site. Union Pacific railroad tracks are oriented northeast to southwest, and are adjacent to the Project site to the east. A golf course is located to the east of the Union Pacific railroad tracks, but otherwise the Project site is surrounded by agricultural land.

The Project site is located at the southeastern edge of the City of Vacaville's Sphere of Influence, outside of the incorporated City limits. The Southtown portion of the Project site is included in the City's Comprehensive Annexation Plan, but the Southtown Commons portion of the Project is not.

Project Objectives

The objectives of the proposed Project include:

- A variety of housing opportunities for all social and economic sectors of the City;
- Greenbelts, open space areas, parks, landscaped areas, bicycle paths and pedestrian trails;
- Community facilities;
- Neighborhood serving commercial uses;
- Household and recreational vehicle storage;
- Infrastructure extensions to the area south of the Project site; and,
- A two-lane extension of Foxboro Parkway from its current terminus at Nut Tree Road to the intersection of Vanden and Leisure Town Roads.

The alternatives analysis in Section 4.0 of this EIR uses the Project Objectives as its starting point – only alternative projects or alternative sites that fulfill a significant number of the Project Objectives are analyzed for environmental impacts.

Environmental Impact and Mitigation Measures

This EIR has been prepared to examine potentially significant environmental effects of construction and operation of residential, civic, and commercial uses proposed as a part of the Southtown Project. The EIR identifies mitigation measures that would reduce impacts found to be potentially significant in the EIR analysis. A summary of the findings of the environmental analysis and mitigation measures is presented in Table ES-1.

This report characterizes environmental impacts as being "significant" or "less than significant." These words define the degree of impact as required by the California Environmental Quality Act (CEQA) Guidelines. The CEQA Guidelines define a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any physical conditions within an area affected by the project, including air, land, flora, fauna, ambient noise, and objects of historic and aesthetic significance." Mitigation measures are constructed to avoid or reduce the potentially significant impacts, and are required by this EIR to be incorporated into the Project. When these impacts, despite incorporation of mitigation measures, cannot be mitigated to a less-than-significant level, they are identified as "significant and unavoidable impacts."

If a lead agency wishes to approve a project with significant unavoidable impacts, the agency must adopt a Statement of Overriding Considerations (SOC). The lead agency's SOC should indicate that the EIR has been reviewed, the benefits of the project have been compared to significant environmental effects, the benefits of the project outweigh the unavoidable adverse environmental effects, and thus these effects may be considered "acceptable" CEQA Guidelines Section 15093(a).

Significant and Unavoidable Impacts

Based on the analysis described in Section 3.0 of this EIR, the following impacts are significant and unavoidable:

- Indirect effects on viability of agricultural operations
- Short-term construction related emissions
- Operational emissions
- Cause adverse change to historic resources
- Noise and vibration impact to proposed project land uses
- Increase in noise above ambient level
- Reduction in LOS of nearby roadways and intersections
- Cumulative aesthetic impact
- Cumulative air quality impact
- Cumulative biological resources impact
- Cumulative noise impact
- Cumulative traffic impact

Potentially Significant Impacts Mitigated to a Less-than-Significant Level

Based on the analysis described in Section 3.0 of this EIR, the following impacts are potentially significant, but feasible mitigation measures are available that would reduce the impact to a less-than-significant level:

- Conversion of agricultural land
- Inconsistency with zoning or Williamson Act contract
- Carbon monoxide concentrations
- Substantial adverse impacts to special-status species
- Substantial adverse impacts to sensitive natural communities
- Substantial adverse impacts on wetlands
- Substantial interference with movement of native fish or wildlife species
- Cause adverse change to archaeological resources within the project site
- Potential for liquefaction
- Potential for erosion or loss of topsoil
- Consistency with the Vacaville General Pan, Land Use and Development Code, and Comprehensive Annexation Plan
- Construction noise and vibration impact
- Traffic noise impact
- Require new or expanded wastewater treatment facilities
- Require new or expanded water distribution or treatment facilities
- Access to sufficient water supplies
- Impacts associated with nearby airport
- Require new and/or expanded storm drain facilities
- Stormwater runoff impacts on water quality
- Substantially alter the existing drainage pattern
- Increase runoff to exceed existing and/or future storm drain capacity
- Place structures in 100-year flood hazard zone
- Increased runoff leading to on-site, localized, or downstream flooding
- Inadequate bicycle and transit access
- Inadequate parking supply for routine use
- Cumulative agricultural resources impacts

Less than Significant Impacts

Based on the analysis described in Section 3.0 of this EIR, the following impacts are less than significant:

- View alteration resulting from project development
- Change in visual character of project site
- Impact on resources within state scenic highway
- Inconsistency with General Plan aesthetic policies
- Nighttime light spillage and glare produced by project
- Conflict with adopted Habitat Conservation Plan
- Potential for major geologic hazard
- Consistency with the Draft Solano County Habitat Conservation Plan

- Induce substantial population growth
- Demand for additional fire services
- Demand for additional police services
- Impact on school facilities
- Demand for additional parks services
- Demand for additional roads and roadway services
- Impacts to general government services
- Exceed wastewater treatment requirements of the Central Valley Regional Water Quality Control Board
- Need for new or expanded storm drain facilities
- Sufficient water storage facilities
- Access to sufficient solid waste facilities
- Access to electricity and gas service areas
- Release of hazardous materials into environment
- Proximity to a designated hazardous materials site
- Potential for wildland fires
- Inadequate emergency access

Table ES-1
Summary of Environmental Impacts

Topic/Impact Number	Impact Description	Significance	MM	Residual Significance
Aesthetics				
Impact AVR-1	View Alteration Resulting from Project Development	Less than significant	None required	
Impact AVR-2	Change in Visual Character of Project Site	Less than significant	None required	
Impact AVR-3	Impact on Resources within State Scenic Highway	No impact	None required	
Impact AVR-4	Inconsistency with General Plan Aesthetic Policies	Less than significant	None required	
Impact AVR-5	Nighttime Light Spillage and Glare Produced by Project	Less than significant	None required	
Agricultural Resources				
Impact AG-1	Conversion of Agricultural Land	Potentially significant	MM AG-1	With incorporation of Mitigation Measure AG-1, the impact is less than significant
Impact AG-2	Inconsistency with Zoning or Williamson Act Contract	Potentially significant	MM AG-1	With incorporation of Mitigation Measure AG-1, the impact is less than significant
Impact AG-3	Indirect Effects on Viability of Agricultural Operations	Potentially significant	None available	The impact is significant and unavoidable
Air Quality				
Impact AQ-1	Short-Term Construction Related Emissions	Potentially significant	MM AQ-1	The impact is significant and unavoidable
Impact AQ-2	Operational Emissions	Potentially significant	MM AQ-2	The impact is significant and

Topic/Impact Number	Impact Description	Significance	MM	Residual Significance
				unavoidable
Impact AQ-3	Carbon Monoxide Concentrations	Potentially Significant	MM T-1a MM T-1b	With incorporation of these mitigation measures, the impact is less than significant
Biological Resources				
Impact BIO-1	Substantial Adverse Impacts to Special-Status Species	Potentially significant	MM BIO-1a MM BIO-1b MM BIO-1c MM BIO-1d MM BIO-1e MM BIO-1f	With incorporation of these mitigation measures, the impact is less than significant
Impact BIO-2	Substantial Adverse Impacts on Sensitive Natural Communities	Potentially significant	MM BIO-3a	With incorporation of mitigation, the impact is less than significant
Impact BIO-3	Substantial Adverse Impact on Wetlands	Potentially significant	MM BIO-3a	With incorporation of mitigation, the impact is less than significant
Impact BIO-4	Substantial Interference with Movement of Native Fish or Wildlife Species	Potentially significant	MM BIO-1a MM BIO-1b MM BIO-1c MM BIO-1d MM BIO-1e MM BIO-1f	With incorporation of these mitigation measures, the impact is less than significant
Impact BIO-5	Conflict with Local Policies or Ordinances Protecting Biological Resources	No impact	MM BIO-5	With mitigation, the impact is less than significant.
Impact BIO-6	Conflict with an Adopted Habitat Conservation Plan	Less than significant	None required	

Topic/Impact Number	Impact Description	Significance	MM	Residual Significance
Cultural Resources				
Impact CR-1	Cause Adverse Change to Historic Resources – Farmsteads One and Two	Less than significant	None required	
	Cause Adverse Change to Historic Resources – Farmstead Three	Potentially significant	MM CR-1	After mitigation, the impact will remain significant and unavoidable.
Impact CR-2	Cause Adverse Change to Archaeological Resources within the Project Site	Potentially significant	MM CR-2	With incorporation of this mitigation measure, the impact is less than significant
Geology, Soils, and Mineral Resources				
Impact GEO-1	Potential for Major Geologic Hazard	Less than significant.	None required	
Impact GEO-2	Potential for Liquefaction	Potentially significant	MM GEO-2	With incorporation of this mitigation measure, the impact is less than significant
Impact GEO-3	Potential for Erosion or Loss of Topsoil	Potentially significant	MM GEO-3a MM GEO-3b	With incorporation of these mitigation measures, the impact is less than significant
Land Use Planning				
Impact LAN-1	Consistency with the Vacaville General Plan, Land Use and Development Code, and Comprehensive Annexation Plan	Potentially significant	MM LAN-1	With incorporation of this mitigation measure, the impact is less than significant
Impact LAN-2	Consistency with the Draft Solano County Habitat	Less than significant	None required	

Topic/Impact Number	Impact Description	Significance	MM	Residual Significance
	Conservation Plan			
Impact LAN-3	Induce Substantial Population Growth	Less than significant	None required	
Noise				
Impact N-1	Construction Noise and Vibration Impact	Potentially significant	MM N-1	With incorporation of this mitigation measure, the impact is less than significant
Impact N-2	Traffic Noise Impact	Potentially significant	MM N-2	With incorporation of this mitigation measure, the impact is less than significant
Impact N-3	Noise and Vibration Impact to Proposed Project Land Uses – Landscape Equipment	Potentially significant	MM N-3	With incorporation of this mitigation measure, the impact is less than significant
	Noise and Vibration Impact to Proposed Project Land Uses – Railroad Tracks	Potentially significant	None available	Significant and unavoidable
Impact N-4	Increase in Noise above Ambient Level	Potentially significant	None available	Significant and unavoidable
Public Services				
Impact PS-1	Demand for Additional Fire Services	Less than significant	None required	
Impact PS-2	Ability to Meet Minimum Fire Flow Requirements	Less than significant	None required	
Impact PS-3	Demand for Additional Police Services	Less than significant	None required	
Impact PS-4	Potential Impact on School Facilities – Enrollment Caused by Development	Less than significant	None required	
Impact PS-5	Demand for Additional Parks Services	Less than significant	None required	
Impact PS-6	Demand for Additional Roads and Roadway Services	Less than significant	None required	

Topic/Impact Number	Impact Description	Significance	MM	Residual Significance
Impact PS-7	Impacts to General Government Services	Less than significant	None required	
Public Utilities				
Impact UTI-1	Require New or Expanded Water Treatment or Distribution Facilities	Potentially significant	MM UTI-1 MM UTI-2 MM UTI-3	With incorporation of these mitigation measures, the impact is less than significant
Impact UTI-2	Access to Sufficient Water Supplies	Potentially significant	MM UTI-4	With incorporation of this mitigation measure, the impact is less than significant
Impact UTI-3	Sufficient Water Storage Facilities	Less than significant	None required	
Impact UTI-4	Exceed Wastewater Treatment Requirements of the Central Valley Regional Water Quality Control Board	Less than significant	None required	
Impact UTI-5	Require New or Expanded Wastewater Treatment Facilities	Less than significant	MM UTI-5 MM UTI-6 MM UTI-7 MM UTI-8 MM UTI-9	With incorporation of these mitigation measures, the impact is less than significant
Impact UTI-6	Access to Sufficient Solid Waste Facilities	Less than significant	None required	
Impact UTI-7	Provision of Electricity and Natural Gas Service	Less than significant	None required	
Safety				
Impact SAFE-1	Release of Hazardous Materials into Environment	Less than significant	None required	
Impact SAFE 2	Proximity to a Designated Hazardous Materials Site	Less than significant	None required	
Impact SAFE 3	Impacts Associated with Nearby Airport	Potentially significant	MM SAFE-3	With incorporation of this mitigation

Topic/Impact Number	Impact Description	Significance	MM	Residual Significance
				measure, the impact is **less than significant**
Impact SAFE 4	Potential for Wildland Fires	**Less than significant**	None required	
Surface Hydrology and Water Quality				
Impact HYDRO-1	Require New and/or Expanded Storm Drain Facilities	**Potentially significant**	HYDRO-1a HYDRO-1b HYDRO-1c HYDRO-1d	With incorporation of these mitigation measures, the impact is **less than significant**
Impact HYDRO-2	Stormwater Runoff Impacts on Water Quality	**Potentially significant**	HYDRO-2a HYDRO-2b	With incorporation of these mitigation measures, the impact is **less than significant**
Impact HYDRO-3	Substantially Alter the Existing Drainage Pattern	**Potentially significant**	HYDRO-2a HYDRO-2b	With incorporation of these mitigation measures, the impact is **less than significant**
Impact HYDRO-4	Increase Runoff to Exceed Existing and/or Future Storm Drain Capacity	**Potentially significant**	HYDRO-1a HYDRO-1b HYDRO-1c HYDRO-1d	With incorporation of these mitigation measures, the impact is **less than significant**
Impact HYDRO-5	Place Structures in 100-Year Flood Hazard Zone	**Potentially significant**	HYDRO-5a HYDRO-5b	With incorporation of these mitigation measures, the impact is **less than significant**
Impact HYDRO-6	Increased Runoff Leading to On-site, Localized, or Downstream Flooding	**Potentially significant**	HYDRO-6a HYDRO-6b	With incorporation of these mitigation measures, the

Topic/Impact Number	Impact Description	Significance	MM	Residual Significance
				impact is less than significant
Transportation				
Impact T-1	Reduction in LOS of nearby Intersections	Potentially significant	MM T-1a	Significant and unavoidable
	Roadway Segments	Potentially significant	MM T-1c	The impact to Leisure Town Road is significant-and-unavoidable.
Impact T-2	Inadequate Bicycle and Transit Access	Potentially significant	MM T-2	Less than significant
Impact T-3	Inadequate Parking Supply for Routine Use	Potentially significant	MM T-3	Less than significant
Impact T-4	Inadequate Emergency Access	Less than significant	None required	
Cumulative				
Cumulative Aesthetic Impact		Cumulatively considerable	None Available	Significant and unavoidable
Cumulative Agricultural Resources Impacts		Cumulatively considerable	MM AG-1	Less than cumulatively considerable
Cumulative Air Quality Impact		Cumulatively considerable	None available	Significant and unavoidable
Cumulative Biological Resources Impact		Cumulatively considerable	None available	Significant and unavoidable
Cumulative Noise Impact		Cumulatively considerable	None available	Significant and unavoidable
Cumulative Traffic Impact		Cumulatively considerable	MM T-1b	Although the Alamo Drive/Peabody

Topic/Impact Number	Impact Description	Significance	MM	Residual Significance
				Road intersection would be impacted, LOS D is estimated whether or not the Project is developed. The impact for this intersection is **significant-and-unavoidable.**
Other Cumulative Impacts		No other cumulative impacts were identified through comprehensive cumulative impact assessment.	None required	**Less than cumulatively considerable**

Areas of Controversy/Issues to Be Resolved

Several parties submitted responses to the Notice of Preparation (NOP) of the Project EIR. The NOP responses are included in Appendix A. Several agencies identified issues and information that would need to be included in the EIR (the agency responsible for identifying the issue is included in parentheses):

- The Project's impacts on school facilities should be addressed, as the proposed development will add 175 K-12 students to the Vacaville schools (Vacaville Unified School District).
- Air quality issues related to the Project should be adequately considered, including local and regional impacts to air quality. This includes impacts to sensitive receptors, climate and topography, existing conditions, air quality regulations, and the local and regional transportation system, and impacts resulting from construction and operation of planned land uses (Yolo-Solano Air Quality Management District).
- Impacts of the Project on agricultural resources should be adequately considered in the EIR, including loss of prime farmland and impacts to lands under Williamson Act contracts (California Department of Conservation).
- Analysis should include impacts to Fairfield School District and regional roads connecting Vacaville and Fairfield (City of Fairfield).
- Full impacts of traffic and transportation on local and regional roadways should be assessed in a traffic report (California Department of Transportation).
- The Project should be reviewed for consistency with adopted Airport Land Use Compatibility Plans, specifically those related to Nut Tree Airport and Travis Air Force Base (U.S. Federal Aviation Administration).
- The EIR should address surface water runoff, water quality degradation, and impacts of soil erosion on area waterways (Solano County Water Agency).

1.0 Introduction

Project Background

This EIR addresses the impacts of two properties proposed for development, which are described in detail in Section 2.0, Project Information. The Southtown portion of the Project includes areas west of Leisure Town Road, where a mix of residential, commercial, and civic uses is envisioned. The Southtown Commons portion includes areas of the Project site east of Leisure Town Road, where a mix of commercial and residential uses is anticipated. The EIR addresses impacts of both portions of the Project.

Purpose of the EIR

This Draft Environmental Impact Report (DEIR) has been prepared by the City of Vacaville (the City), in accordance with the California Environmental Quality Act (CEQA) and the CEQA Guidelines. As provided in Section 15121(a) of the Guidelines, this Draft EIR is intended to serve as an informational document that will:

> ...inform public agency decision-makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project...

Section 15378 of the CEQA Guidelines defines a "project" as the whole of an action, which may be subject to several discretionary approvals, and which has the potential to result in a physical change in the environment, directly or ultimately. The Project analyzed and reported in this Draft EIR is described in Section 2.0, Project Information.

Prior to approving the proposed Project, pursuant to Section 15091 of the CEQA Guidelines, one or more of the following findings must be made for each significant environmental effect identified through the Draft EIR process:

- Changes or alterations have been required in, or incorporated into, the Project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.
- Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
- Specific economic, social, or other considerations make infeasible the mitigation measures or project alternatives identified in the final EIR.

In addition, Section 15093 of the Guidelines requires that the decision makers balance the benefits of a proposed project against any unavoidable environmental effects which would result from the implementation of the project. If the benefits of the project outweigh the unavoidable adverse effects, then the environmental effects may be considered acceptable and a statement of overriding considerations adopted.

The Guidelines stipulate that EIRs should be prepared as early as feasible in the planning process to enable environmental considerations to influence project design (Guidelines Section 15004) and that, to the extent possible, the EIR process should be combined with the existing planning, review, and project approval process used by each public agency (Section 15080). Consequently, this Draft EIR is to be completed prior to formal consideration by the City of the Project, ensuring an opportunity to develop Project design alternatives and other measures which would minimize the potential adverse environmental effects associated with the Project.

In accordance with State law, the EIR is subject to a public review and comment period, beginning with the circulation of the document to all responsible, trustee, or other interested State, federal, and local agencies. The availability of the EIR and specified review period is noticed in the manner prescribed by law to afford the general public knowledge of the review process and access to the environmental document. During this review period, written comments regarding the environmental aspects of the Project are submitted to the Lead Agency. This review and comment period allows the public and interested agencies the opportunity to participate in the environmental review process.

Following the review period, comments received, whether written or oral, are evaluated and a written response is prepared. These comments and responses are incorporated into the Final EIR, along with a list of all persons, organizations, and agencies commenting on the Draft EIR. The City may then certify that the Final EIR has been completed in compliance with CEQA and that the information contained in the Final EIR was reviewed and considered prior to making a decision on the Project. Along with the necessary findings, the City will adopt a mitigation monitoring and reporting program. This program is required by law to ensure that mitigation measures deemed necessary and feasible by the Lead Agency are implemented. Adoption of a mitigation monitoring and reporting program is independent of the EIR certification process.

Previous Environmental Analysis

Vacaville General Plan and EIR

Vacaville's current General Plan was adopted in 1990 and amended in 1999. This State-mandated document is required to contain seven elements including: Land Use, Circulation, Housing, Open Space, Safety, Conservation, and Noise. The General Plan also includes a Parks and Recreation Element and a Public Facilities, Institutions, and Utilities Element. Elements contain goals, policies, and programs, which are representative of the direction of growth desired by the community and provide guidance to development through the creation of a framework with which all development must be consistent. Policies in the General Plan are implemented through actions taken by the City's Planning Commission and City Council and other decision-making bodies. The General Plan requires that all development be consistent with the General Plan and be subject to site development and design review. The General Plan and EIR are considered where relevant in the various sections of this EIR. The Project includes proposed General Plan Amendments that, if approved, would make the Project consistent with the General Plan.

Vanden Specific Plan

The General Plan identifies a large portion of the site as being located within the Vanden Specific Plan, which is no longer applicable as the Specific Plan was abandoned by the developers and not fully processed by the City.

Comprehensive Annexation Plan

Pursuant to the Standards and Procedures adopted by the Solano County LAFCO, the City of Vacaville has adopted a Comprehensive Annexation Plan (CAP). The CAP is intended to consolidate and summarize development policies of the City and provide an overview of growth within Vacaville over a 10- to 15-year planning period. Required elements within a CAP include: an urban growth strategy, an infill strategy, and an agricultural preserve strategy. The most recently adopted CAP for Vacaville covers the planning period between 2001 and 2015.

Pursuant to the requirements of the Solano County LAFCO, areas of proposed annexation must be located within the sphere of influence, designated for urban uses in the GP, and outside existing city limits.

The Project site is identified as a Long Term Annexation Area in the CAP, indicating a projected annexation between 2006 and 2015. The site is considered a new residential growth area and is required to be developed through a specific plan (or planned development). However, the General Plan Amendments proposed as part of the Project specify that specific development policies will be included in the General Plan to guide Project development, and that a separate Specific Plan will not be required. Timing of processing and development is subject to a phasing plan established by the City.

Solano County General Plan

Parcels included in the Project site under Solano County's jurisdiction are zoned A-40 (agricultural use, 40-acre parcels). Through the annexation process, the Project site would have City land use and zoning designations. The Solano County General Plan and EIR were used in preparation of this EIR, providing useful background environmental setting and impact information.

Solano Habitat Conservation Plan

There is no adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan in the Project vicinity. However, a County-wide Habitat Conservation Plan is currently being prepared by participating agencies in Solano County, and is undergoing a process of refinement and agency approval.

Scope and Methodology

The City determined that the proposed Project could have a significant effect on the environment and that an EIR is necessary. Therefore, pursuant to Section 15063(a) of the CEQA Guidelines, an initial study was not necessary and was not prepared.

On June 13, 2003, a Notice of Preparation (NOP) with Preliminary Project Description was sent to the State Clearinghouse and to various Responsible and Trustee agencies. A copy of the Notice of Preparation is contained in Appendix A of this document, along with a list of Responsible and Trustee agencies to which these documents were sent. Written responses to the NOP are also contained in Appendix A.

This Draft EIR analyzes the potential effects of site preparation, construction, and operation of the Project, including direct effects of the Project, as well as reasonably foreseeable indirect effects and cumulative and growth-inducing effects.

The following is a summary description of the environmental topics addressed in this Draft EIR, based on the requirements of CEQA and comments received in response to the NOP.

Aesthetics. Addresses visual impacts of the proposed Project, including the effects of site grading, building construction, and nighttime illumination.

Agricultural Resources. This section examines the impact of the Project, both directly and indirectly, on existing agricultural operations and impacts of converting important agricultural land to urban use.

Air Quality. Addresses the incremental and cumulative effect the Project will have on the air quality of the Project vicinity and the Sacramento Valley Air Basin.

Biological Resources. Addresses the impacts on the diversity and number of plant and animal species that may be present on-site, threatened and endangered plants and wildlife, new species introduction, jurisdictional wetlands, habitat deterioration, and relationship to the Solano Habitat Conservation Plan.

Cultural Resources. Addresses potential impacts the Project may have on known and unknown prehistoric and historical resources.

Geology, Soils, and Mineral Resources. Addresses geotechnical impacts associated with site development, including changes in topography, soil erosion, geologic and seismic hazards, and potential loss of mineral resources.

Land Use, Planning, Population, and Housing. This section describes the Project's relationship with land use and other policies adopted with the intent of reducing potential future environmental impacts. In addition, the effects of the Project related to population growth and housing in the vicinity are examined.

Noise. Addresses the level of noise generated during construction and by operation of the proposed Project, as well as the effect of the existing noise environment on sensitive uses proposed in the Project.

Public Services. This section addresses the impact the Project may have on the ability of the City and other service providers to maintain sufficient levels of service, and the impact of any capacity expansions required as a result of the Project.

Public Utilities. This section addresses the ability of public utility providers to service the uses proposed in the Project and the impact of any service or capacity expansions required as a result of the Project.

Safety. Addresses impacts associated with potential site contamination and release of hazardous substances, as well as general safety issues associated with occupation of residences and operation of businesses proposed as part of the Project.

Surface Hydrology and Water Quality. Addresses changes in drainage patterns resulting from site grading, changes in absorption rates and runoff, changes in surface water quality, and quality/quantity of groundwater.

Transportation. Addresses direct and cumulative effects of the Project on the roadway system, vehicular circulation, transportation safety hazards, and pedestrian circulation.

Project Alternatives. Provides an analysis of viable alternatives to the proposed Project, as prescribed in Section 15126.6(a) of the CEQA Guidelines and as interpreted through recent binding court decisions.

Cumulative and Long-Term Effects. Provides an analysis of the cumulative impact of the Project as viewed in conjunction with other land use change in the vicinity, as well as potential irreversible changes that would occur as a result of the Project, as required by Section 15126(c) of the CEQA Guidelines.

Required Actions

As defined by CEQA, the City of Vacaville (the City) is the Lead Agency for this Project. The Vacaville City Council is responsible for final action on the environmental determination and Project.

City of Vacaville. Certification of this Draft EIR will be necessary in order for the City to take action on the Project. The City will also take several interim actions that are necessary for full project development, including approval of the proposed General Plan Amendments and rezoning, amendments to the Comprehensive Annexation Plan, annexation of the properties, approval of development agreements, approval of tentative and final maps, design review, and issuance of grading and building permits.

Subsequent to City action on the Project, other agencies may consider actions, permits, and approvals that may be necessary prior to development and operation of the Project. This Draft EIR may be used for evaluation of such subsequent actions. Following are agencies that may have jurisdiction over certain aspects of the Project:

Yolo-Solano Air Pollution Control District. An Authority to Construct Permit is required for construction of the Project. Coordination with the Air District also allows appropriate assessment of

impacts and design of mitigation measures consistent with the applicable air quality attainment plans.

Regional Water Quality Control Board. The Regional Water Quality Control Board will require a Construction Activities Storm Water Permit. Permit requirements include development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) which specifies Best Management Practices (BMPs) that will prevent all construction pollutants from contacting stormwater and with the intent of keeping all products of erosion from moving off site into receiving waters.

Solano Local Agency Formation Commission. All annexations in the County are approved by the Solano Local Agency Formation Commission (LAFCO). Annexation procedures include a review of the proposed boundary change in light of 11 Standards established by Solano LAFCO's adopted *Standards and Procedures*. An annexation is required to fully comply with six mandatory standards, which relate to general plan consistency, environmental impacts, and sphere of influence issues. The remaining five standards are discretionary and address issues related to the establishment of logical boundaries, growth inducement, prime agricultural farmland, as well as social and economic impacts.

Solano Airport Land Use Commission. Since the Project is not consistent with General Plan land use designations, Airport Land Use Commission (ALUC) review will be required. More detailed information than has been provided by the Project proponent thusfar will be required, especially detailed site layouts, building heights, locations of trees, and sufficient detail regarding the proposed land uses to determine any structural, electrical, light, glare, smoke, or visual interference with aircraft flight. This EIR will also be used by the ALUC in its review.

U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service (USFWS) is responsible for implementation of the Federal Endangered Species Act (FESA). The FESA requires that projects ensure their actions do not jeopardize the continued existence of species listed as endangered or threatened or result in the destruction or adverse modification of the critical habitat of these species.

Army Corps of Engineers. The Corps regulates discharge of dredged or fill material into waters of the United States under Section 404 of the Clean Water Act (CWA). "Discharge of fill material" is defined as the addition of fill material into waters of the U.S., including, but not limited to, the following: placement of fill that is necessary for the construction of any structure or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §328.2(f)].

California Department of Fish and Game. Under Section 1603, a private party must notify the California Department of Fish and Game (CDFG) if a proposed Project will "substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds...except when the department has been notified pursuant to Section 1601." If an existing fish or wildlife resource may be substantially adversely affected by the activity, the CDFG may propose reasonable measures that will allow protection of those resources. If these measures are agreeable to the party, they may enter into an agreement with the CDFG identifying the approved activities and associated

mitigation measures.

CDFG also administers the Native Plant Protection Act. The legal protection afforded listed plants under the Native Plant Protection Act involves provisions that prohibit the taking of plants from the wild and a salvage requirement for landowners. Once they have been notified of the presence of a listed species on their property, landowners are required to tell CDFG at least ten days prior to any land use change. This allows for the salvaging of plants that would otherwise be destroyed.

The CDFG is also responsible for enforcing the California Endangered Species Act of 1984 (CESA), CDFG is responsible for ensuring that Projects do not adversely affect a species listed as endangered or threatened under CESA (Section 2090 of the Fish and Game Code).

Contact Person

Comments on the Draft EIR should be addressed to Mr. Chris Gustin, Assistant Director, Community Development Department, City of Vacaville, 650 Merchant Street, Vacaville, CA 95688.

Source References

A complete listing of source references is found in Section 6.0 of this report.

2.0 Project Information

Project Description

The proposed Project includes applications for General Plan amendment, rezoning, and annexation to the City of Vacaville to accommodate approximately 1,410 housing units, 30,000 square feet of commercial space, 6.8 acres of self storage, 33.5 acres of park space, a fire station, and 14 acres of public/civic space. Proposed development would eliminate the existing system of irrigation and tailwater ditches, the man-made depressions on eastern portion of the Project site, and the approximately 2,500-foot segment of Brazelton Drain between Vanden Road and Nut Tree Road, which would be culverted. The segment of Brazelton Drain between Vanden Road and the Union Pacific Railroad right-of-way (which is off-site) would be re-graded and widened to accommodate project-generated runoff from the Southtown portion of the Project site. Surface runoff from the Project site east of Leisure Town Road site would be discharged into Alamo Creek, requiring modifications to the bank of the channel. A municipal domestic well site of approximately one acre will be required by the City, though the exact location of the well has not been determined. The Project also includes a two-lane extension of Foxboro Parkway from its current terminus at Nut Tree Road to the intersection of Vanden and Leisure Town Roads.

The environmental analysis considers impacts related to site preparation, construction, and occupation of each proposed land use, as well as the construction and operation of all supporting infrastructure, utilities, and services. The components of the Project are summarized in Table 2-1, described in detail below, and shown graphically in Figure 2-1.

Table 2-1
Project Summary

Proposed Land Use	Number of Units/Area/Square Feet
Single-Family, Detached Residential	1,127 units
Single-Family, Attached Residential	60 units
Multi-Family Residential	223 units
Total Residential	**1,410 units**
Office/Commercial	30,000 square feet
Self-Storage/Mini-Warehouse	6.8 acres
Community Center/Civic Uses	14 acres

Aside from the construction and operational phase, there are two geographic parts of the Project with different property owners. For the benefit of City decision makers, the EIR distinguishes the western Southtown portion of the Project from the eastern Southtown Commons portion of the project, where appropriate.

Southtown Portion of Project

The proposed Project, for land west of Leisure Town Road, includes applications for General Plan amendment, rezoning, and annexation to the City of Vacaville.

Residential

This approximately 250-acre portion of the Project site will be developed with 1,170 residential dwelling units at varying densities and of varying types. Development plans include residential areas of low-, medium-, and high-density residential units that will be both for sale and for rent, including single-family residences, apartments, and townhomes. Approximately 887 of the dwelling units are single-family detached units, 60 are townhomes (attached single-family units), and the remaining 223 units are apartments. The eventual residential population is estimated to be approximately 3,500, based on 2000 Census average household size figures for the different proposed housing types and Project proponent estimates.[1]

Commercial

The Southtown side of the Project will also include approximately 30,000 square feet of commercial land uses, approximately 14 acres dedicated to a town center/community facility, and a fire station. The commercial uses would accommodate approximately 60 employees.[2]

Civic/Recreational

The Project will also include the development of an open space system providing bicycle and pedestrian access throughout the site. Leisure Town Road will be constructed in accordance with the provisions of the Jepson Parkway Concept Plan, including required medians, landscaping, and pedestrian and bicycle paths along the roadway frontage on both the western Southtown side and eastern Southtown Commons side of the Project. A neighborhood park will also be constructed on the Southtown portion of the Project site.[3]

Nut Tree Road will be widened to the planned full-design width. The Project will also involve a landscaped setback area and meandering sidewalk along the eastern side of the roadway adjacent to the western boundary of the Southtown site.

Grading

An estimated 100,000 to 300,000 cubic yards of soil will need to be imported for the Southtown side of the Project site. Refer to the Geology, Soils, and Minerals section of this EIR, Section 3.6, for more detail.

Southtown Commons Portion of Project

On the eastern side of Leisure Town Road, a mix of residential and commercial uses is proposed on this approximately 37-acre portion of the Project site, as is a General Plan amendment, rezoning, and annexation to the City of Vacaville.

Residential

For Southtown Commons, 240 detached single-family residential dwelling units are proposed. The residential population is estimated to be approximately 680 to 700.

Each housing type will be designed with a localized or pocket park, which will provide connection to the pedestrian walkways. Garages will be accessed via driveways at the rear of lots. The main parkway and internal collector roads will be developed with street setback to allow for tree-lined streets and landscaping.

Commercial

Approximately seven acres of public storage facilities will be developed along the eastern boundary of the Project site between the proposed housing units and the adjacent railroad tracks.

Grading

An estimated 50,000 to 100,000 cubic yards of soil will need to be imported for the Southtown Commons side of the Project site. Refer to the Geology, Soils, and Minerals section of this EIR, Section 3.6, for more detail.

Project Location

The approximately 290-acre Project site is located outside of Vacaville city limits near the southeastern edge of the developed city (Figure 2-2). Leisure Town Road bisects the Project site, and separates the Southtown portion of the Project on the west from the Southtown Commons portion of the Project on the east. Nut Tree Road is serves as the western boundary of the Project site, and the Union Pacific railroad tracks are located along the eastern extremity. Alamo Creek is a northern boundary, and Opal Way is located at approximately the southern extremity.

Adjacent Land Uses

Single-family residential land uses are present on both the north and west sides of the site. Union Pacific railroad tracks are oriented northeast to southwest, and are adjacent to the Project site to the east. Alamo Creek is located to the north of the Project site. Kinder Morgan maintains a petroleum pumping facility on the northern side of the railroad tracks, immediately adjacent to the southern edge of the Southtown Commons portion of the Project site. An underground petroleum is located adjacent to the railroad tracks. This pipeline is planned to be relocated several miles from the Project site.[4] A golf course is located to the east of the Union Pacific railroad tracks, but otherwise, the Project site is surrounded by agricultural land, mainly used for hay and wheat crop production and cattle grazing.

Environmental Setting

The 260-acre Southtown portion of the Project site is currently developed with agricultural land uses. The 37-acre triangular-shaped Southtown Commons portion of the Project site is bisected by the Dally Canal. North of the canal, the site is developed with one residence and a grazing area. South of the canal, the site appears fallow but has historically been used for agricultural purposes.

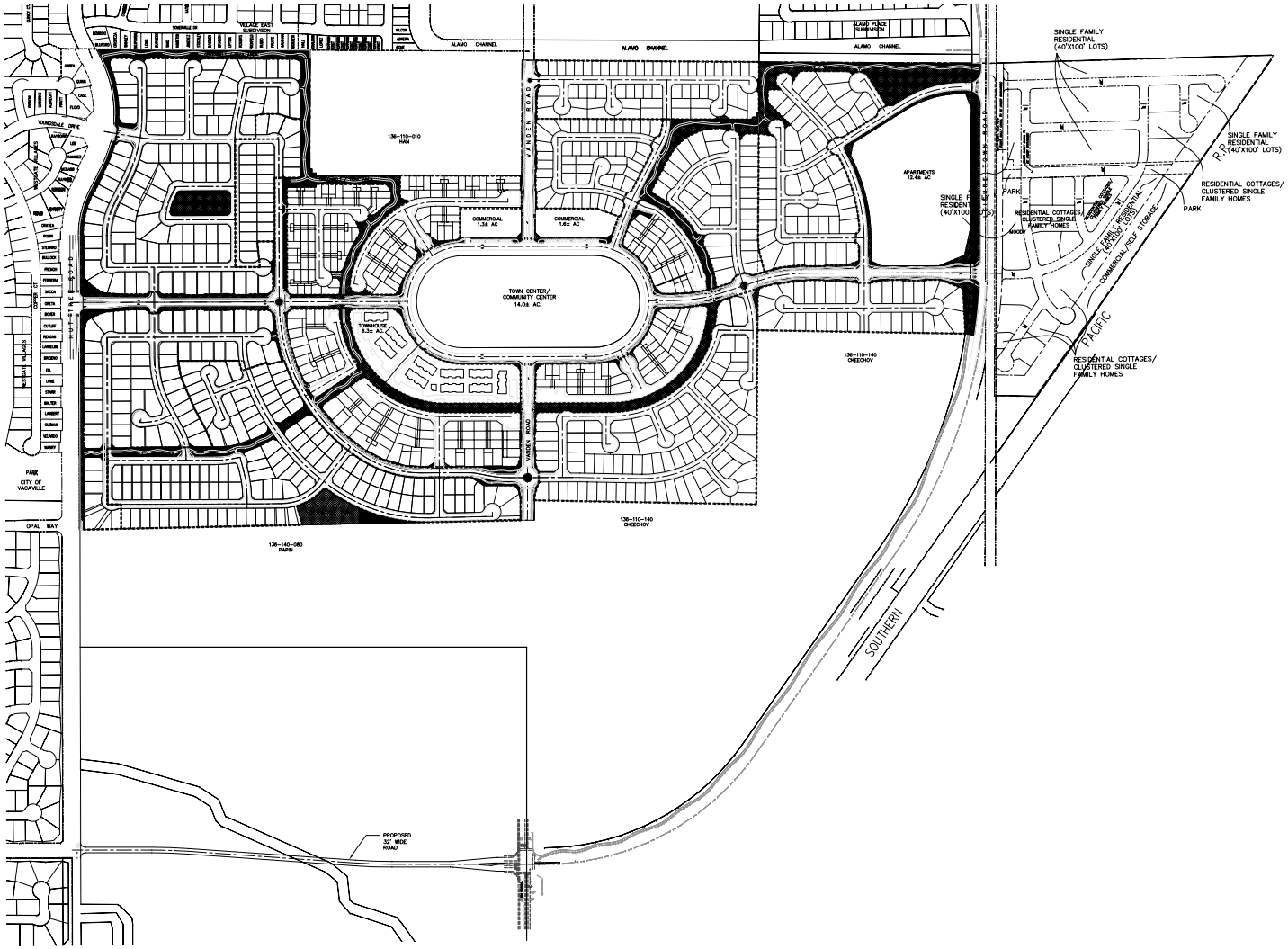
Slopes are generally from the northwest to the southeast. Soils are alluvial basin and delta soils, which are typically found on basin rims, alluvial fans, and deltas, and in basins, dredge spoil areas, and salt water marshes.[5] There do not appear to be any faults on the Project site. The Natural Resources Conservation Service's system has seven classes of soils (ranging from a high of I to a low of VII) and Classes I and II are considered to be of prime agricultural significance. Soils in the Project vicinity are of Class I and II.

The Project site includes three homesites with dwelling units and accessory structures, with open views in each direction from the center of the property. One of the three homesites is abandoned, while two others are occupied.

Non-native vegetation, generally agricultural crops, grasses, and other low-lying plants, are the dominant visual characteristic. Limited trees exist on the Project site, generally found surrounding home sites. With little topographical variation, the site maintains lengthy views in all directions.

The Dally Canal, a Solano County Irrigation District facility, runs east to west, along the northern boundary and through the Project property. The newly realigned Alamo Creek is located immediately north of the site.

The Project is proposed in northeastern Solano County, an area with flat topography, hot and dry summers, and mild and wet winters. Vacaville is located at the southwestern end of the Sacramento Valley Air Basin, which is bounded by the Coast Range on the west and the Sierra Nevada Mountains on the east. Wind direction tends to be southerly as a result of marine breezes through the Carquinez Strait. Northerly winds occur more often in the winter.



Source: *Philippi Engineering, 2003; adapted by Cotton/Bridges/Associates, 2003.*

No Scale

Figure 2-1
Proposed Project Site Plan

Relevant Planning Information

The Project site is located in the southeastern portion of the City of Vacaville's Sphere of Influence, outside of the incorporated City boundary. The Southtown portion of the Project site is included in the City Comprehensive Annexation Plan, but the Southtown Commons portion of the Project is not.

The Vacaville General Plan includes land use designations for the entire Southtown Project site. The land use designations for the site include: estate (0.5-3 dwelling units per acre), low density residential (3.1-5 dwelling units per acre), two elementary school sites, two public park sites, The eastern corner, east of Leisure Town Road is included within the Fry Specific Plan area. A large portion of the Project site is identified by the current General Plan as being located within the Vanden Specific Plan, which was not implemented and is no longer if effect. The entire Project site is located within the City's Sphere of Influence. The current General Plan designation on the Southtown Commons portion of the Project site is "Residential Estates," with an associated development density of 0.5 to 3 dwelling units per acre.

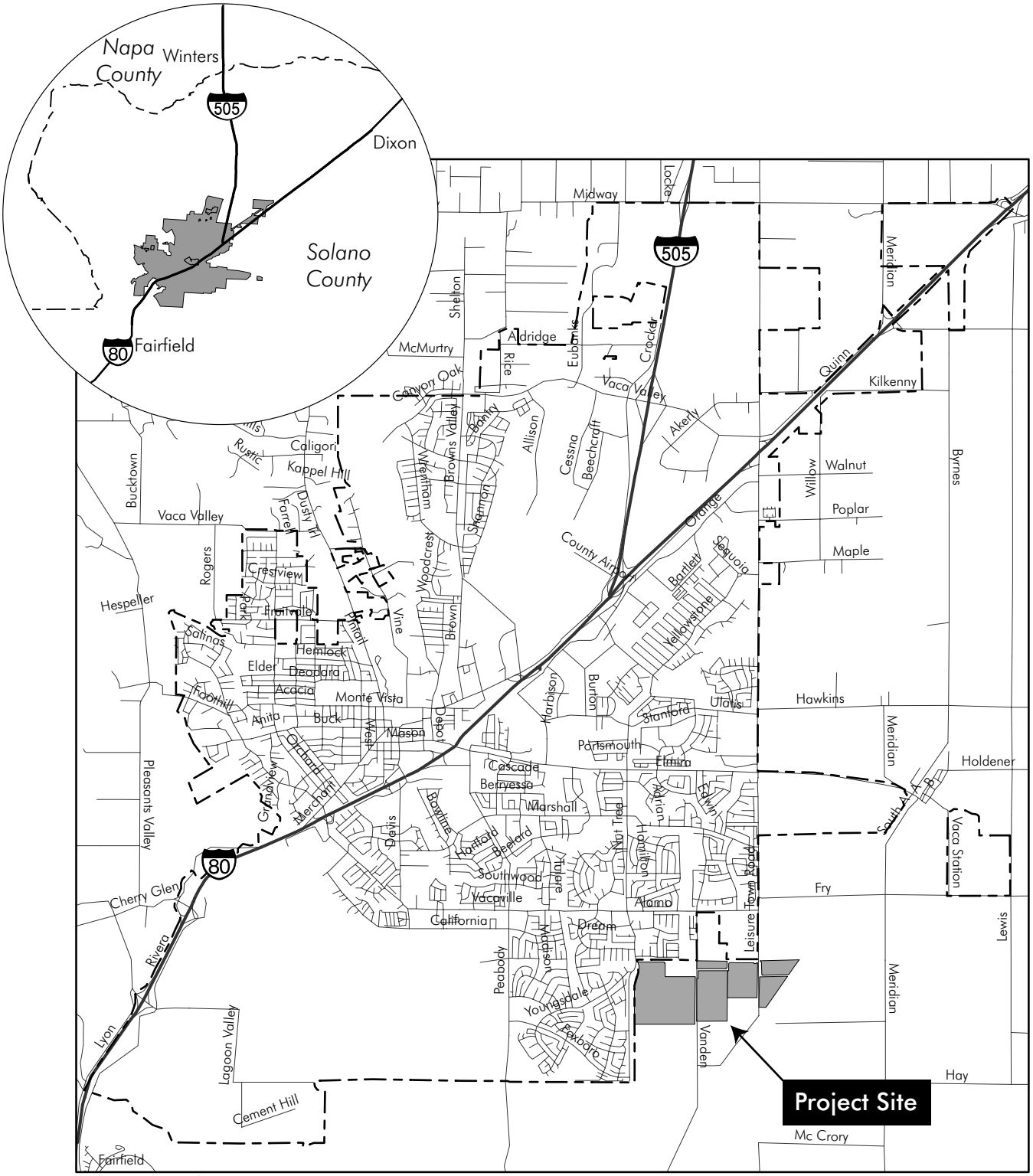
For the purposes of air quality planning and monitoring, the Project site, located within the Yolo-Solano Air Quality Management District, has a non-attainment designation for State ozone and particulate matter standards. The Project site is within the Sacramento Federal Ozone Non-attainment Area. For all other pollutants where there is an attainment standard, the Project area is classified as either in attainment or unclassified.

Project Objectives

The objectives of the proposed Project include:

- A variety of housing opportunities for all social and economic sectors of the city;
- Greenbelts, open space areas, parks, landscaped areas, bicycle paths and pedestrian trails;
- Community facilities;
- Neighborhood serving commercial uses;
- Household and recreational vehicle storage;
- Infrastructure extensions to the area south of the Project site; and,
- A two-lane extension of Foxboro Parkway from its current terminus at Nut Tree Road to the intersection of Vanden and Leisure Town Roads.

The alternatives analysis in Section 4.0 of this EIR uses the Project Objectives as its starting point – only alternative projects or alternative sites that fulfill the majority of the Project Objectives are analyzed for environmental impacts.



Source: *Cotton/Bridges/Associates, 2003*

Vacaville City Boundary

Solano County Boundary

N

0 .5 1 1.5 2 Miles

Figure 2-2
Regional Location

Notes and References

[1] U.S. Census Bureau. 2000 U.S. Census.
[2] Bay Area Economics. *Draft Vacaville Southtown Market Impact, Economic Impact, and Fiscal Impact Analysis.* August 20, 2003.
[3] Phillipi Engineering. *Southeast Vanden Area, Vacaville CA, Infrastructure Feasibility Study*. July 2003.
[4] California State Lands Commission. *Draft Environmental Impact Report for Concord to Sacramento Petroleum Products Pipeline Project*. June 2003
[5] USDA, Soil Conservation Service, UC Agricultural Experiment Station, "General Soil Map", 1972

3.0 Environmental Analyses

Organization of the EIR

The discussion of each of the environmental topics addressed in this EIR, as identified in Section 1.0, has been organized consistent with CEQA requirements, and to provide a clear and easy-to-read structure for decision makers, public agencies, and the general public. The following describes the layout of the environmental analyses sections.

Environmental Setting

The environmental setting provides a description of the environmental conditions that may be affected by the Project. Site-specific environmental conditions are explained, and expanded to include broader local and regional conditions, where appropriate.

Regulatory Setting

The regulatory setting identifies the various local, regional, State, and federal agencies which have jurisdictional control over the Project area. The section will explain the presiding agency's jurisdictional power and list the specific documents, standards, or policies that will govern the environmental analysis. This section will appear only when there are applicable controlling agencies for the environmental topic.

Where existing regulations would reduce a particular environmental impact, these regulations are described in detail and factored into the analysis and characterization of remaining impact, wherever possible. If existing regulations will be required as a part of normal review or permitting of the Project, these regulations and permit requirements are not included as mitigation measures except where the EIR can offer specific guidance or prescribe performance standards for the regulations.

Thresholds of Significance

Thresholds of significance are the evaluation criteria by which potential impacts are measured and determined to be significant or less than significant. Impact evaluation criteria include local, State, and federal standards, where appropriate, and criteria contained in Appendix "G" of the CEQA Guidelines.

Environmental Impact and Mitigation Measures

This section succinctly describes the various environmental impacts of the project, and recommends mitigation measures, where appropriate.

- ***Description of Potential Impacts:*** Each potential impact associated with a subject area is described relative to the impact threshold criterion identified for that subject area. Each potential impact is given a summary heading and a number for future reference and for matching with mitigation measures.

- ***Mitigation Measures:*** To the extent practicable, a mitigation measure is recommended for each identified potential impact. Each mitigation measure is numbered for future reference and states to which impact (by number) or impacts the mitigation would apply. The level of significance following application of recommended mitigation measures is identified as being either significant or less than significant.

The above-described text organization conforms to the standards for adequacy of an EIR set forth in Section 15151 of the CEQA Guidelines, which states:

> An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed Project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts.

3.1 Aesthetics

This section provides an analysis of the potential impacts of the Project on aesthetic and visual resources within the community.

Environmental Setting

The Project site is best characterized as rural in appearance, with clear visual indication of agricultural activities occurring both here and on adjacent properties to the south and east. This site represents the southerly edge of development for Vacaville, with adjacent sites to the north and west developed with suburban scale residential homes, parks, and roads. The Project site includes three homesites with dwelling units and accessory structures, with open views in each direction from the center of the property. One of the three homesites is abandoned, while two others are occupied.

Non-native vegetation, generally agricultural crops, grasses, and other low-lying plants, are the dominant visual characteristic. Limited trees exist on the Project site, generally found surrounding home sites. With little topographical variation, the site maintains lengthy views in all directions. Current light generation on-site is limited to internal and external home lighting from the two inhabited residential properties.

The Land Use Element of the General Plan identifies the major aesthetic resources of the city, including its views of the Vaca Mountains, Alamo Creek Ridge, and the English Hills. Beyond these prominent features, there are also various creeks and riparian corridors which serve as important visual resources for the city. No such aesthetic resources exist on the Project site, although views of area mountains and hills are present from portions of the site.

The figures on the following pages present site photography of the entire Project site, with emphasis on the visual characteristics of the property. Conditions as they exist, as of July 2003, are considered the baseline aesthetic form for this analysis.

Source: *Cotton/Bridges/Associates, 2003*

Figure 3.1-1
Site Photos

Regulatory Setting

The Vacaville General Plan provides a significant number of policies related to the protection and preservation of scenic resources within the community. The following is a listing of the policies applicable to aesthetic impacts within the city.

Policy 2.1-G 5
Design aesthetically pleasing roadways, including a loop system lined with trees or other appropriate landscaping, that connect Vacaville neighborhoods and serve planned development. Streets alone should not be used to set the outer limits of urbanization.

Policy 2.1-G 9
Preserve scenic features and the feel of a city surrounded by open space, and preserve view corridors to the hills, and other significant natural areas.

Policy 2.1-G 10
Protect the natural environment that the City enjoys and use creeks, hills, utility corridors, viable agricultural lands or other significant natural features wherever appropriate to establish ultimate city boundaries.

Policy 2.1-I 1
Continue to implement design guidelines for all development, including residential, commercial, and industrial projects and public facilities.

Policy 2.1-I 3
Adopt and implement a plan to establish standards and design guidelines for the city's streets, entry ways, and open spaces. Making streets identifiable by their design, marking entrances to the City, finding alternatives to sound walls, and getting the strongest visual lift from existing open spaces are important ingredients of image.

Methodology

Assessment of impacts to aesthetics and visual resources is based on objective evaluation of the proposed Project's effects on the visual environment of the site and its surroundings. This includes consistency with local ordinances and policies adopted for visual integrity of the community, impact on viewsheds and scenic areas identified as important or valuable to the community, and change in visual character of the site as compared to existing conditions.

Consideration and evaluation of aesthetics, as considered in this report, is defined narrowly to include only analysis of objective, quantifiable characteristics of visual form, including physical site characteristics, lighting, height and form of proposed structures, viewsheds, and the like. The analysis does not include subjective evaluation of characteristics such as colors, architectural styles, building materials, or other matters of personal preference. Only those visual entities which may be shown to objectively impact the environment or surroundings are considered.

Thresholds of Significance

Impacts would be considered significant if the Project would:

- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area;
- Be inconsistent with General Plan standards for protection of scenic resources;
- Significantly alter existing viewsheds, including changes to natural terrain;
- Substantially change the existing visual quality of the region or eliminate visual resources therein;
- Result in the obstruction of any scenic vista or view open to the public, or in the creation of an aesthetically offensive site open to public view;
- Produce light or glare that could create hazards or nuisances; or
- Conflict with any previously adopted mitigation measures applicable to the Project site.

Environmental Impact and Mitigation Measures

Impact AVR-1: View Alteration Resulting from Project Development

Various aspects of Project development have the potential to alter views from the Project site. Grading activities and construction of buildings have the greatest potential for creating such impacts. Limited views of nearby mountains and hills exist in the vicinity of the Project site. Existing views are limited by surrounding urban developments, including residential homes on two sides of the Project and a golf course to the east. The following discussion considers the potential of the project to alter views of and around the Project site.

The existing Project site is relatively flat, with little topographical variation. Grading activities will occur on all portions of the site, although the flat topography of the site will require only surficial grading. Because no hill forms or other unique topographic features will be altered or removed as part of site grading, these activities are not expected to significantly alter the existing views from adjacent properties.

Development of the Project site may result in the blockage of existing views from adjacent properties. The Project includes construction of commercial, residential, and institutional structures on the site, with anticipated heights ranging from 15 to 35 feet in height. Initial Project descriptions indicate that residential, commercial, and community center uses would be three stories or less, resulting in heights less than 35 feet. Single-family residential development is anticipated to include one- and two-story structures, with maximum heights reaching 30 feet. Multiple-family residential

development is expected to include two- and three-story structures reaching 35 feet in height. Commercial development is expected to be one-story only, with heights less than 20 feet. Institutional development on the Project site will include some form of development in the town center area, most likely a church, recreational center, or other community use. Such a structure is not expected to surpass 35 feet in height, although zoning provisions allow for heights of up to 70 feet in this area.

In addition to the view blockage that may occur from buildings, landscaping may also reduce the existing views from adjacent properties. Vacaville Improvement Standards regulate the type of landscaping that will be placed on Project roadways, but landscaping of individual residential and commercial lots is largely up to each property owner. Once mature, trees and vegetative cover could reach heights exceeding 80 feet. It is expected that such landscaping would be similar in height and scale to that of adjacent residential areas, and would not pose a greater likelihood for view alteration than surrounding residential landscaping.

Development of the Project will further limit the views of the surrounding mountains from the Project site and potentially limit views from certain adjacent points. However, with only surficial grading and a maximum anticipated height of 35 feet for all buildings on the site, the potential impact on views from adjacent properties is minimal. The impact is considered **less than significant**.

Impact AVR-2 Change in Visual Character of Project Site

The Project site is characterized by flat terrain with indications of recent and previous agricultural activities. Views from and through the site are open, with undeveloped farmland comprising the visual character of the site. Development of the Project will result in the creation of urban buildings, landscaping, and associated improvements. While this will represent a significant change in the visual character of the site, the General Plan and other regulatory documents have not identified this landscape type as a scenic or visual resource to be protected. The conversion of visual character from agricultural to suburban in appearance, while striking, does not represent a significant impact on the environment, and thus the impact is considered **less than significant**.

Impact AVR-3 Impact on Resources within State Scenic Highway

The Project site is not located within the vicinity of a scenic highway, designated either by the City of Vacaville or the State. The nearest highways to the site are Interstate 80 (2.4 miles) and Interstate 505 (2.8 miles). The Project site is not visible from either freeway, and the Project is not expected to have any adverse impacts on any resource within a State scenic highway. There is **no impact**.

Impact AVR-4 Inconsistency with General Plan Aesthetic Policies

The Vacaville General Plan includes multiple policies adopted to protect visual resources within the community and ensure that new development is visually consistent and complimentary with existing surrounding land uses. Applicable General Plan policies stated under the Regulatory Setting heading in this section (page 3.1-3) are analyzed for consistency in the following table.

Table 3.1-1
Consistency with Relevant General Plan Aesthetic Policies

Goal, Policy, or Objective	Is the Project Consistent?	Explanation
LAND USE ELEMENT		
Guiding Policy 2.1-G 5 Design aesthetically pleasing roadways, including a loop system lined with trees or other appropriate landscaping, that connect Vacaville neighborhoods and planned development. Streets alone should not be used to set the outer limits of urbanization.	Yes	The Project includes provisions for landscape strips along major roadways, consistent with Vacaville standards.
Guiding Policy 2.1-G 9 Preserve scenic features and the feel of a city surrounded by open space, and preserve view corridors to the hills, and other significant natural areas.	Yes	The Project is located at the edge of the developed city, and is bounded on the south and east by open agricultural spaces. No view corridors of hills or other significant natural areas are impaired as a result of the Project.
Guiding Policy 2.1-G 10 Protect the natural environment that the City enjoys and use creeks, hills, utility corridors, viable agricultural lands or other significant natural features wherever appropriate to establish ultimate city boundaries.	Yes	The Project will expand the city limits, but will maintain agricultural lands as the city boundary on the south and east side of the Project. With regard to the aesthetic intent of this policy, the Project is compliant.
Guiding Policy 2.1-I 1 Continue to implement design guidelines for all development, including residential, commercial, and industrial projects and public facilities.	Yes	This Project will be subject to the design review guidelines required of all new development in Vacaville.
Guiding Policy 2.1-I 3 Adopt and implement a plan to establish standards and design guidelines for the city's streets, entry ways, and open spaces. Making streets identifiable by their design, marking entrances to the City, finding alternatives to sound walls, and getting the strongest visual lift from existing open spaces are important ingredients of image.	Yes	The Project will comply with design standards for street and landscaping design, making streets identifiable. Sound walls may be included for noise attenuation, but alternatives are being considered for aesthetic and social improvement.

The Project design, including location of land uses, setbacks, landscaping, and other features were compared to the relevant policies of the General Plan, as they are related to scenic and visual resources. The Project will not result in a substantial change to the overall character of the community, nor will it violate specific policies relating to visual resources. The impact is considered **less than significant**.

Impact AVR-5 Nighttime Light Spillage and Glare Produced by Project

Light spillage refers to the amount of light generated on the Project site that is visible from adjacent properties. Light that "spills" over onto adjacent properties is measurable and can serve as a visual nuisance to other property owners and users. Major sources of light production will likely include street lighting, security lighting in commercial locations, and exterior residential lighting. While a photometric light production study has not been completed as part of the initial Project design or environmental review, it is possible to analyze impacts based on typical light production from these sources and their likely impacts on adjacent properties. Photometric studies are required as part of the development review process in the City, and will be required for specific development applications of uses considered in this EIR.

The Land Use Development Code has established light standards for safety onsite for various uses. While there is no adopted threshold for light spillover impacts, the City typically requires developers to use a combination of setbacks, landscaping, and other light diffusion methods to reduce light spillover to less than one-quarter footcandle, as measured at the adjacent property line. Design and installation guidelines for commercial building security lighting, along with landscape plans, are usually sufficient to keep normal safety and security lighting at or below this threshold at the property boundaries, although careful review of proposed lighting at commercial sites will be made during site plan review for development of new buildings. Exterior residential security lights and street lights found along most residential streets within Vacaville are considered both common and necessary for residential areas. The impact of such lighting on adjacent residential areas to the north and west is negligible, as these areas also utilize such light sources. Visual impacts of light on adjacent properties to the east will be reduced by the distance of lights from those properties, where the railroad tracks will help serve as a buffer for light spillover.

The adjacent agricultural properties to the south represent the greatest potential area of impact for light spillover. Most of the southerly boundary of the project will consist of fenced backyards of single-family residences, which will shield residential light sources from the agricultural areas beyond. Notable exceptions include the terminus of Vanden Road and one local road, which will have street lighting up to the edge of the property line. One additional local road also runs parallel to the property line for a short distance, just west of Vanden Road. From this area, light generated by street lights and residences on the north side of the street will not be buffered from the southern adjacent property. While these unobstructed areas are present, there is not likely to be enough spillover from street and residential security lighting to create a major impact on the agricultural property to the south. Street lights contain light shields to direct light downward, minimizing visibility from adjacent properties, and home lighting is generally low wattage and also downward shielded.

Use of lighting during the night can result in the production of glare, which reduces visibility of the sky both at the point of light production and in its surrounding areas. No standards have been adopted by the City related to glare impacts, and there is no universally accepted method of quantifying glare impacts. While some glare will inevitably occur from nighttime lighting within the Project, the overall impact is minimized by the location of urban land uses adjacent to the Project site. The resulting change in nighttime glare at the Project site and from surrounding properties is not likely to alter views substantially. There is a potential for safety impacts related to lighting on the

site and its effect on Travis Air Force Base. These impacts are mitigated in Section 3.11 of this DEIR. The overall impact of light spillover and glare on aesthetics is considered to be **less than significant**, and no mitigation is proposed.

3.2 Agricultural Resources

This section assesses the extent to which development of the proposed Project would adversely affect important agricultural resources, conflict with adopted agricultural preservation policies, and conflict with agricultural zoning designations. Where impacts are identified, every feasible mitigation measure is recommended.

Environmental Setting

Agriculture takes place on two-thirds of the land in Solano County, with irrigated agriculture taking place on half of the farmland. Leading crops in the county are nursery stock, tomatoes, alfalfa hay, cattle and calves, wine grapes, feeder lambs, wheat, field corn, walnuts, and milk. Agricultural production and related businesses significantly contribute to the county's economy generating approximately $1.5 billion in annual sales. Farmland east of Leisure Town Road supports both field and row crops of different varieties, including tomatoes, sugar beets, wheat, corn, beans, and barley. The Project site is currently used for hay crop production, pasture for cattle and horses, and one abandoned and two active farmsteads, while a small portion of the land is fallow. Approximately 95 percent of the total Project site is agricultural land. The Project site has soils suitable for agricultural production:

- 180 acres of Capay silty clay loam (Ca, Class II, Storie Index = 69);
- 63 acres of Rincon clay loam, 0 to 2 percent slopes (RoA, Class II, Storie Index = 72)
- 2 acres of Brentwood clay loam, 0 to 2 percent slopes (BrA, Class I, Storie Index = 81)
- 40 acres of San Ysidro sandy loam thick surface, 0 to 2 percent slopes (SfA, Class III, Storie Index = 49)

Regulatory Setting

The U.S. Department of Agriculture and California Department of Conservation monitor conversion of farmland and develops methods of categorizing farmland according to its overall agricultural capacity. The State of California has developed farmland preservation programs, such as the Williamson Act, and legislation to protect ongoing operations from nuisance complaints. Solano County and the City of Vacaville have recognized the important value of agriculture, and have established policies to preserve farmland and encourage the viability of agricultural operations. Key aspects of the regulatory setting are described below.

Classifying Farmland

The California Department of Conservation (DOC) develops programs to protect agricultural resources of the state and track conversion of agricultural land. Concern about the loss of important farmland led DOC to develop the Farmland Mapping and Monitoring Program, which

classifies different agricultural soil types relating to their ability to sustain agricultural crops. The following categories are used:

- ***Prime Farmland*** is land with the best combination of physical and chemical features for the long-term production of agricultural crops. This land can economically produce sustained high yields when treated and managed according to modern farming methods.
- ***Farmland of Statewide Importance*** is land with a good combination of physical and chemical features but with minor shortcomings such as greater slopes or with less ability to hold and store moisture.
- ***Unique Farmland*** is land of lesser quality soils used for the production of the state's leading agricultural cash crops.
- ***Farmland of Local Importance*** is pasture land and other agricultural land identified by the local jurisdiction as being important.

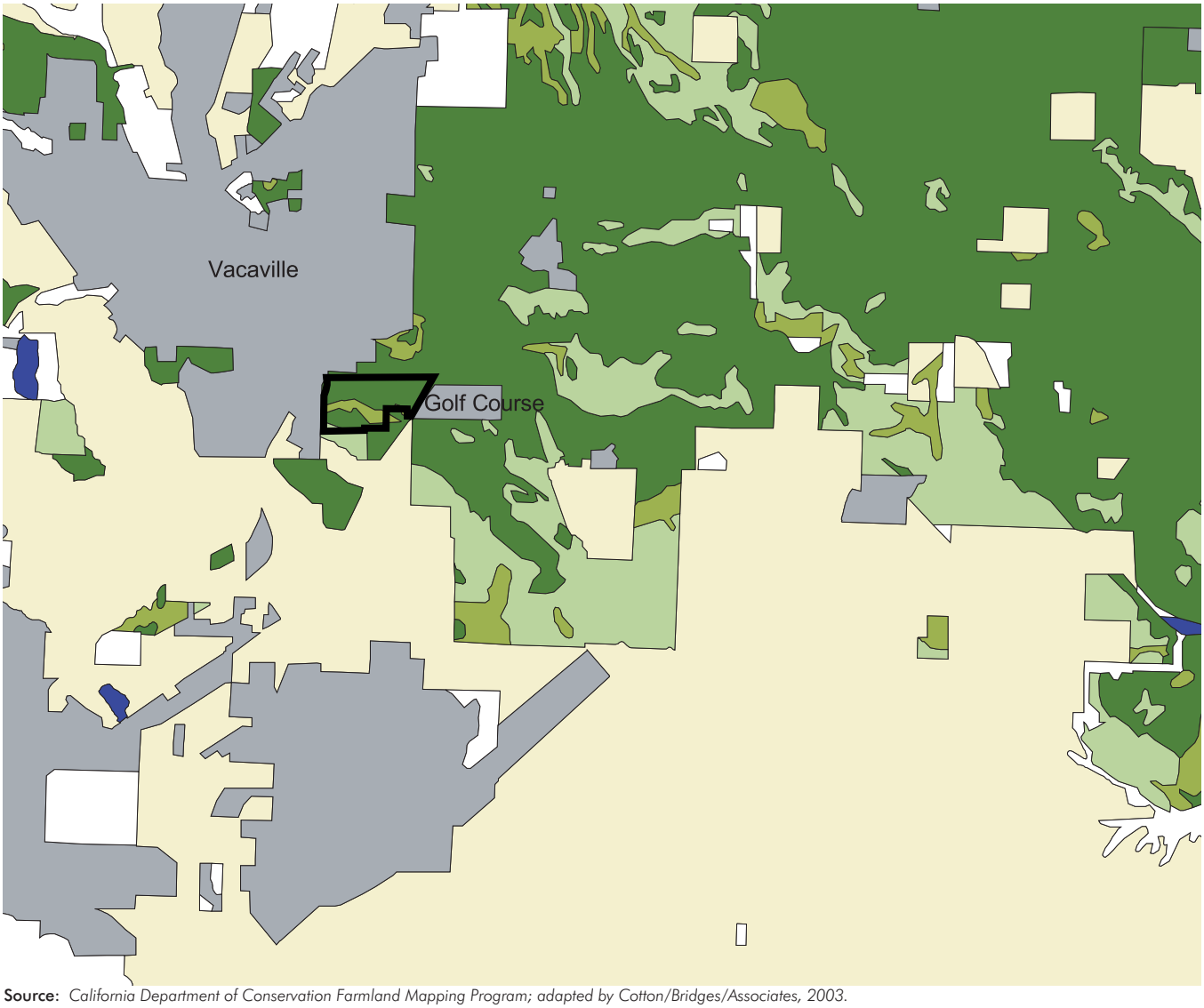
According to DOC, 169 acres of Important Farmland in Solano County were converted to urban use between 1996 and 1998, and another 149 acres were converted between 1998 and 2000. Approximately 250 acres were converted to urban use between 1994 and 1996. This conversion is predominantly a result of the conversion of small properties, ranging from approximately 4 acres to 35 acres.[1] Farmland in Solano County is shown in Figure 3.2-1, classified according to California DOC classifications.

Evaluating Farmland Conversion Impacts

The California Land Evaluation and Site Assessment (LESA) Model is used by many lead agencies in assessing agricultural land conversions quantitatively in the environmental review process (Public Resources Code Section 21095), including in CEQA review. The LESA is a point-based approach for rating the relative importance of agricultural land resources, and considers soil quality, parcel size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. For a given project, the factors are rated, weighted, and combined, resulting in a single numeric score. The score associated with the agricultural resource becomes the basis for making a determination of a project's potential significance.

Nuisance Issues

Urban encroachment upon agricultural areas introduces issues such as land use conflicts, vandalism, increased land values and taxes, and other issues. The State recognized potential land use conflicts, and through AB 1190 (Chapter 97, Statutes of 1992), attempted to avoid impact to agricultural operations associated with urban uses "coming to a nuisance." By amending provisions of the Civil Code of the State of California, under AB 1190, existing agricultural processing facilities do not constitute a nuisance, provided they operate in a manner consistent with historic operations.



Source: *California Department of Conservation Farmland Mapping Program; adapted by Cotton/Bridges/Associates, 2003.*

Legend

- Developed
- Grazing
- Prime Farmland
- Farmland of Statewide Importance
- Unique Farmland
- Water
- Other
- Project Site

N

Figure 3.2-1
Solano County Important Farmland

Williamson Act Program

The Williamson Act establishes a mechanism for contracts between local governments and private landowners, restricting parcels of land to agricultural or related open space use. Landowners are taxed on the capitalization of the income from the land rather than the fair market value, and local governments receive an annual subvention of forgone property tax revenues from the State via the Open Space Subvention Act of 1971. In return, the landowner retains their land in open space or agricultural use for at least 10 years. Land can be withdrawn from a Williamson Act contract through a nine-year process beginning with a non-renewal filing, during which taxes gradually increase to full levies. One piece of property at the Project site's western edge has a non-renewal filing that began with the fiscal year 2002 – 2003.[2] In extraordinary, unforeseen situations, immediate termination is sometimes granted.[3]

City of Vacaville Agricultural Land Preservation Policies

The 1990 Vacaville General Plan includes policies drafted with the intent of preserving the prime agricultural lands that surround the city, as well as the economic viability of existing agricultural operations. The policies can be divided into three categories, which all pertain to a CEQA-level review of agricultural resources impacts of projects:

1. Policies to prevent against direct conversion of prime agricultural land to urban use;
2. Policies to indirectly prevent against agricultural land conversion by increasing density, promoting infill, changing development standards, prevent against urban-agricultural compatibility conflicts, etc., so that demand for urban land use change is met without needing to convert agricultural lands;
3. Work with other agencies that have land use or other authority over surrounding agricultural lands to ensure consistent and logical policies that protect important agricultural lands.

Direct

The General Plan provides for specific urban limit lines that define the boundaries between planned urban and agricultural lands. This is consistent with the intent of Proposition A, an initiative passed by Solano County voters, which restricts new urban development to within city boundaries.

> ***Policy 2.2-G1***
> Establish a long-term Planning Area, and within this area distinguish an agricultural service zone and an urban service zone.
>
> ***Policy 3.5-I1***
> Maintain agricultural production areas east of Leisure Town Road. In accordance with policies set forth in the 1980 General Plan, maintain agricultural production areas in Upper Lagoon Valley, Bassford Canyon and the Vaca Valley.

Indirect

The 1990 General Plan establishes the Residential Urban High Density land use designation, which allows up to 36 units per acre. The previous General Plan's highest density land use designation allowed up to 24 units per acre.[4] Moderate density housing, including zero lot line single-family

homes, have been approved and developed in Vacaville since the 1990 General Plan was adopted. Increased densities allow housing development while reducing the need to urbanize agricultural land.

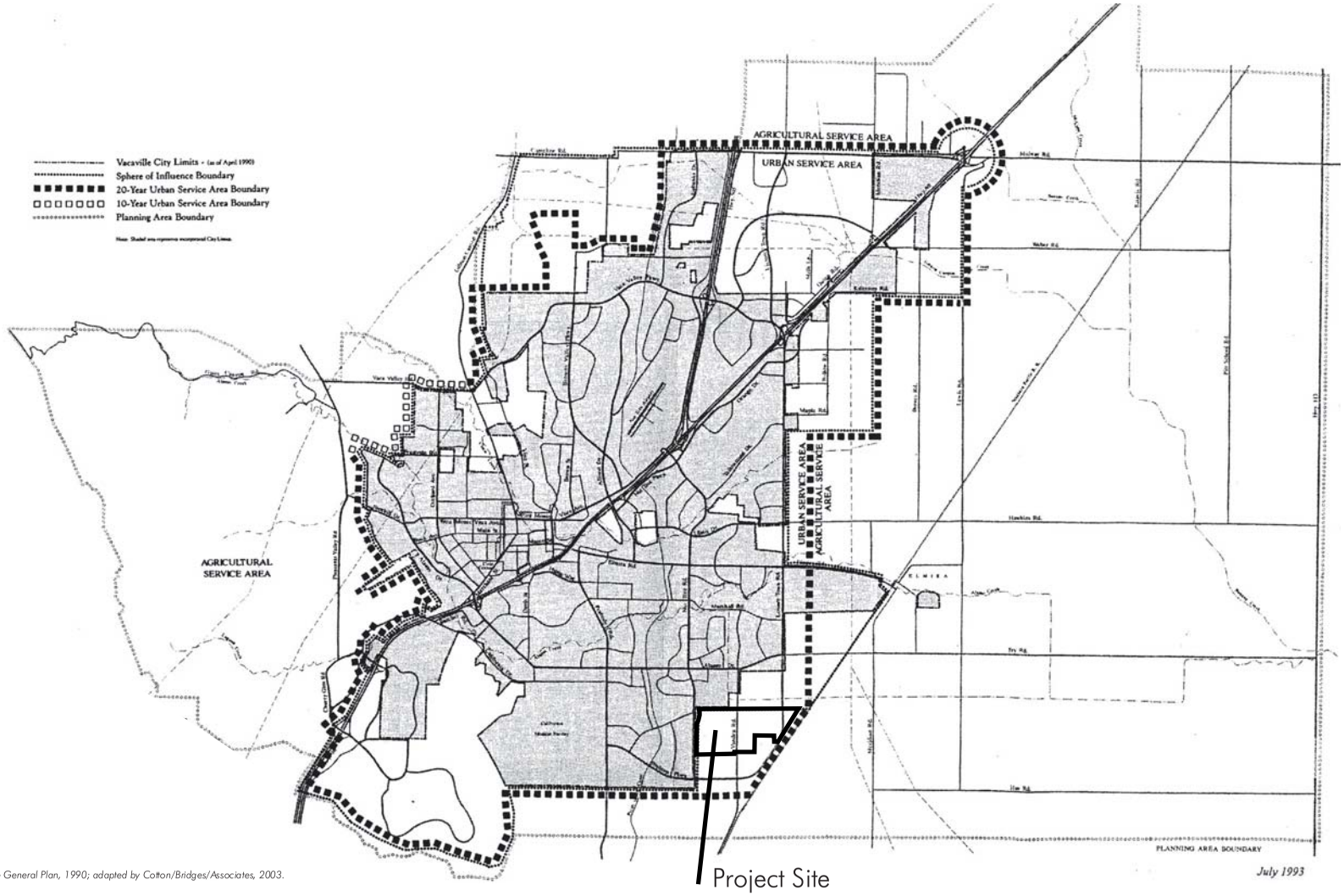
The General Plan establishes policies to provide permanent, 500-foot-wide buffers between agricultural lands and urban uses (Implementing Policy 2.5-1 8, Chapter 2, page 30). The policies ensure a safe distance between urban and agricultural uses, which are subject to chemical spraying and dust generation. Specific provisions and requirements for the buffers are required within the development plans prepared for areas at the urban/rural fringe.

The following policies from the General Plan also indirectly prevent against pressure to convert agricultural land:

> ***Policy 2.1-G4***
> Minimize conflicts between agriculture and urban uses and provide for a transitional area or buffer between agricultural and urban uses.
>
> ***Policy 2.5-I8***
> Maintain buffers between residential and agricultural areas and between residential areas and industrial parks. The minimum separator between residential and agricultural uses shall be 500 feet.
>
> ***Policy 3.5-G5***
> Maintain a compact urban form and locate growth areas to minimize loss of agricultural resources.
>
> ***Policy 3.5-G6***
> Minimize conflicts between urban and agricultural uses by establishing Agricultural Buffers and community separators.
>
> ***Policy 3.5-I8***
> Require a permanent Agricultural Buffer as part of residential developments on the urban edge. Establish appropriate development standards, density transfer provisions, and use regulations for these buffer areas.

Interagency

Vacaville's Urban Service Area is keyed to the planned urban expansion of the city, but it also takes into account the Master Water Agreement with the Solano Irrigation District (SID), adopted in 1995 which provides additional water entitlements for many of the long-term growth areas and provides for the continued agricultural use of lands outside the Urban Service Area boundary. The intent of the agreement is to prevent urban conversion of lands in the Agricultural Service Area (Figure 3.2-2). The Project site is located within the 20-year Urban Service Area.



Source: *Vacaville General Plan, 1990; adapted by Cotton/Bridges/Associates, 2003.*

Figure 3.2-2
Urban Service Area
and Agricultural Service Area

Annexation standards of the Solano Local Agency Formation Commission (LAFCo) also prevent urbanization of agricultural lands and discourage incorporation of outlying parcels if land is available for urbanization within city limits and if conversion of land would adversely affect surrounding lands under some agricultural preserve contracts. Much of the land east of the city is under Williamson Act restrictions.

Interagency policies include:

> ***Policy 2.1-I2***
> Continue to work through established agreements with the (City of Fairfield, City of Dixon, Solano County, and Solano Irrigation District) and public and private agencies to ensure creation of agricultural zones and open space corridors that will serve as community separators between Vacaville and Fairfield and Vacaville and Dixon.
>
> ***Policy 2 2-I4***
> Maintain and implement agreements with the Solano Irrigation District, nearby cities and Solano County and negotiate agreements with other local government entities to help direct the provision of urban services while maintaining as much viable agriculture on prime agricultural soils as is practical and supportive of regional agricultural production consistent with the policies of the General Plan.
>
> ***Policy 3.5-I9***
> Avoid pressures for conversion of agricultural land to urban use east of Leisure Town Road by implementing and maintaining the agreement with the Solano Irrigation District to limit urban water service to these areas. In accordance with policies set forth in the 1980 General Plan, avoid pressures for conversion of agricultural land to urban use in Upper Lagoon Valley, Bassford Canyon and the Vaca Valley.

Methodology

The California Department of Conservation Land Evaluation and Site Assessment (LESA) System is used to determine the relative value of agricultural lands, which considers size of parcels, water resources availability, soil types, distance from developed urban areas, current farming operations, and other factors. Other impacts are assessed based on guidance from the Department of Conservation on indirect land use and economic impacts of urban conversion of agricultural land.

Thresholds of Significance

Impacts would be considered significant if the Project would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;

- Result in the conversion to non-agricultural use any lands identified as significant (point value of 80 or greater) in accordance with the California Department of Conservation Land Evaluation

and Site Assessment (LESA).

- Conflict with existing zoning for agricultural use or a Williamson Act Contract; or,
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use.

Environmental Impact and Mitigation Measures

Impact AG-1 Conversion of Agricultural Land

As indicated in the 1990 General Plan and as a part of the Department of Conservation's Farmland Mapping Program, the Project would result in the conversion of Prime Farmland. Prime Farmland and Farmland of Statewide Importance comprises most of the parcels outside of the city limits east of Vacaville, including the Project site.

Using methodology recommended by the California Department of Conservation, the LESA model was used to assess the significance of agricultural land conversion resulting from implementation of the Project. In Section IV of the LESA Instructional Manual, the significance of project impacts is characterized in the following manner:

60 to 79 Points	Considered significant unless either [the Land Evaluation] or [Site Assessment] subscores is less than 20 points.

As shown in Table 3.2-1, below, the Project scored a 74 and neither subcategory was less than 20. Therefore, the impact is considered **potentially significant**. Approximately 245 acres on-site are active farmland either classified as Prime Farmland or Farmland of Statewide Importance, according to the most recent maps from the California Department of Conservation.

Mitigation Measure AG-1

The applicant shall either preserve 245 acres of active farmland in Solano County with soils similar in productive value to on-site soils through agricultural easement, purchase of development rights, donation of mitigation fees to an agricultural land trust or conservancy, payment of the City's open space fee, contribution to the State Department of Conservation fund for the preservation of farmland, or by some other feasible method, as determined by the City Council, that achieves the goal of preserving active farmland.

With incorporation of the above mitigation measure, the impact would be **less than significant**.

Table 3.2-1
LESA Final Scoresheet

Factor Name	Factor Rating	Factor Weighting	Score
Land Evaluation			
Land Capability Classification	78	0.25	19
Storie Index Rating	67	0.25	17
Site Assessment			
Project Size	100	0.15	15
Water Resource Availability	100	0.15	15
Surrounding Agricultural Lands	50	0.15	8
Protected Resource Lands*	0	0.05	0
TOTAL			**74**

Note: Any discrepancy in the totals is due to rounding. * The LESA model allows the user to identify lands in the zone of influence with some type of agricultural resource protection, but there is no place in the model for identifying parcels on the Project site itself with agricultural resource protections in place. The 132-acre parcel on the western portion of the site, then, is not included in this calculation.

Source: Calculated by Cotton/Bridges/Associates using methods of the California Department of Conservation provided in *California Agricultural Land Evaluation and Site Assessment Model Instruction Manual,* 1997. Soil information from the U.S. Department of Agriculture, Soil Conservation Service.

Impact AG-2 Inconsistency with Zoning or Williamson Act Contract

One parcel, 132 acres in size (which represents approximately 45 percent of the Project area) at the Project site's western edge is under non-renewal filing as of the fiscal year 2002 – 2003.[5,6] Other Project properties are not in Williamson Act contracts. Parcels included in the Project site under Solano County's jurisdiction are zoned A-40 (agricultural use, 40-acre parcels).[7]

The impact is **less than significant** with incorporation of Mitigation Measure AG-1.

Impact AG-3 Indirect Effects on Viability of Agricultural Operations

In addition to farmland directly converted to urban use as a result of the Project, farmland may also be converted indirectly because of growth induced by the Project. The City has attempted to prevent against unnecessary conversion of agricultural land in the General Plan. Establishment of an Agricultural Services Area is intended to provide a definite geographic limit to urban expansion. The Project site is located along the southeastern boundary and within the Urban Services Area.

Agriculture has multiplier effects throughout various sectors of the economy. Agricultural purchases stimulate private sector sales; personal income derived through farming leads to purchases of goods

and services in other sectors; and agricultural operations create jobs in agricultural processing and other sectors of the economy. The loss of agricultural land affects industries supportive of, or dependent upon agriculture, such as agricultural machinery manufacturers, chemical manufacturers, processors, and people working in retail food trade have jobs that are related to agriculture.

In addition, future residents residing in the Southtown area may be bothered by dust and odor generated by adjacent ongoing agricultural operations. Complaints from future Southtown residents may pressure the City to further allow conversion of agricultural lands adjacent to the Project site at an earlier time than what might have otherwise occurred. Lands to the north and west of the Project are either developed with urban uses or under development. The Project is buffered from agricultural operations to the east by the railroad tracks and military golf course. Only ongoing agricultural operations to the south would potentially create some incompatibility with respect to proposed land uses. The City intended to prevent against environmental impacts of incompatibility between urban and agricultural uses through 500-foot buffer requirements contained in the Land Use Element, Implementing Policy 2.5-I8 and Policy 3.5-I8. In Policy 3.5-I8, the agricultural buffer is required as a part of residential development proposed adjacent to agricultural areas. The Brazelton Channel, which is adjacent to the Project site's southern boundary west of Vanden Road, provides some buffer between the Project site and ongoing agricultural operations to the south. East of Vanden Road, there is no proposed or existing buffer or existing physical feature that would provide buffering.

The Project's incompatibility with continued agricultural operations to the south, the conversion of active and fallow agricultural land to urban use, inconsistency with agricultural buffering requirements and policies result in a **potentially significant** impact.

However, the City has established a 20-year Urban Services Boundary that includes the Project site. The Project may convert agricultural land to urban use earlier than would have occurred without the Project, but the conversion was planned to eventually occur. Permanent agricultural buffer easements over 500 feet of the southern boundary of the Project would not be useful since over the next 10-15 years, the lands south of the Project site are planned for urban services by the City.

The impact is **significant and unavoidable**.

Notes and References

[1] California Department of Conservation. Farmland Mapping and Monitoring Program. *2000 Field Report, County: Solano*. 2001.
[2] Denny O'Brien, California Department of Conservation. Personal correspondence, August 5, 2003.
[3] Sierra Club v. City of Hayward, 28 Cal.3d 840 [S.F. No. 24201. Supreme Court of California. February 9, 1981.]
[4] City of Vacaville. *Comprehensive Annexation Plan 2001 – 2015*. October, 2001.
[5] Solano County Assessor's Office. Personal correspondence. June 17, 2003.
[6] Mr. Denny O'Brien from the Department of Conservation helped to sort out a discrepancy between Solano County Environmental Management maps that showed a Project parcel with a Williamson Act contract (Contract #1303 and the Solano County Assessor/Recorder's office, which was given all Project parcel numbers and identified that no Williamson Act restriction existed on any identified parcel.
[7] Solano County Environmental Management. Zoning Map 8-S.

3.3 Air Quality

This section examines the potential air quality impacts resulting from construction and operation of the Southtown Project and describes potential air quality impacts upon proposed land uses from outside influences. Air quality impacts are considered both in the short-term and in the long-term. Short-term effects are those resulting from construction activities. Long-term Project effects are primarily the result of increased traffic in the area, but also include impacts from occupation of proposed residential uses and operation of commercial uses, maintenance of the grounds, and related activities.

Environmental Setting

Terrain, wind, atmospheric stability, and sunlight can affect air quality. The Project is proposed in northeastern Solano County, an area with flat topography, hot and dry summers, and mild and wet winters. Vacaville is located at the southwestern end of the Sacramento Valley Air Basin, which is bounded by the Coast Range on the west and the Sierra Nevada Mountains on the east. Wind direction tends to be southwesterly as a result of marine breezes through the Carquinez Strait. Northerly winds occur sometimes in the winter. The Project site is located in the jurisdictional area of the Yolo-Solano Air Quality Management District (District), which is described in more detail in the Regulatory Setting.

Air pollutants in the vicinity originate from vehicle exhaust, power generation, the operation of equipment in construction and industry, and other activities though "a majority of the District's ozone is produced by motor vehicles."[1] Similarly, the Sacramento region's emission inventory is "dominated by on-road and off-road mobile emissions" (vehicular emissions).[2]

From late spring to early fall, a layer of warm air often overlays a layer of cool air from the Sacramento River/San Joaquin River Delta and San Francisco Bay, resulting in an inversion. Winter inversions are formed when upper layers of air are heated by the sun, trapping cool air beneath. Both inversion types can occur at any time of the year.

The project is surrounded by agricultural land used for growing crops, and not by dairies, rendering facilities, stockyards, or other agricultural uses associated with substantial year-round odors. Similarly, there are no chemical plants, landfills, or other substantial odor-producing facilities that would impact the proposed land uses. Some odor may be produced at certain times of the year at adjacent agricultural lands to the east and southeast of the Project site. The City's Easterly Wastewater Treatment Plant is located approximately 2.25 miles to the northeast. Airflow patterns in the area surrounding the Project are dominated by wind originating southwest of the Project site and moving northeast.[3,4] The Project is adjacent to residential uses to the southwest.

Regulatory Setting

Air quality is regulated by government agencies at the federal and State levels, and authority and responsibility for monitoring and enforcing this regulation rests with regional air quality districts in California. Existing regulations provide a basis for examining the impacts of projects under CEQA, and the enforcement of local air quality regulations can ensure that potential impacts of projects are reduced to the extent feasible, as discussed below.

Federal Clean Air Act

National Ambient Air Quality Standards (NAAQS) have been established by the U.S. Environmental Protection Agency for air pollutants that pose a threat to human health and welfare, as specified in the Federal Clean Air Act (see Table 3.3-1). NAAQS consist of two parts: the allowable concentration of a criteria pollutant; and, the average time period during which the pollutant is to be measured. The concentration standard for the pollutant is based on studies of the effect of the pollutant on human health, crops, vegetation, and in some cases, materials (e.g., paint). Damage from the pollutant is evaluated based on exposure to a high concentration over a short period of time (e.g., 1 hour) or to a low concentration during a longer period (e.g., 8 hours or 24 hours). Some pollutants are evaluated for both time periods due to their effects over the short- and long-term.

The Federal Clean Air Act requires states to create air basins based upon similar meteorological features and without consideration of political boundaries. Criteria air pollutants are monitored within these air basins, which are classified as "attainment" or "non-attainment" based on whether, within the basin, the standards are or are not met. The Project is situated within the Sacramento Valley Air Basin, which includes the counties of Shasta, Glenn, Colusa, Tehama, Butte, Sutter, Yuba, Sacramento, Yolo, and parts of Placer County and Solano County (Figure 3.3-1).

Criteria air pollutants include carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. These pollutants are the result of both stationary and mobile sources, and are monitored under the provisions of the Federal Clean Air Act and California Clean Air Act. Toxic air pollutants and sources are monitored and toxic emissions activities require permits from local air quality management districts in California to comply with local, federal, and State standards.

The Project site is within the Sacramento Federal Ozone Non-attainment Area, which includes Sacramento County, Yolo County, the northeast portion of Solano County, Placer and El Dorado Counties (except mountain portions), and part of Sutter County adjacent to Sacramento County.

California Clear Air Act

The California Clean Air Act, which was approved by the California Legislature in 1988, establishes the framework for addressing air quality issues in the state. The Act created air quality goals, planning mechanisms, regulatory policies, and specific strategies for improving air quality. The Act requires the attainment of State ambient air quality standards. Individual special attainment plans are required for those districts that are in violation of State ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide standards.

The State of California has adopted air quality standards for most of the federal criteria pollutants. These are referred to as the California Ambient Air Quality Standards (CAAQS). Refer to Table 3.3-1 for identification of federal and State air quality standards. Similar to the federal standards, the California standards have been designed to protect the most sensitive persons from illness or discomfort (with a margin of safety). In most cases, the State standards are more stringent than federal standards, and in the case of PM_{10} and sulfur dioxide, they are far more stringent. In addition to the criteria pollutants identified by the federal government, California has adopted standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles.

The YSAQMD has a non-attainment designation for ozone and particulate matter standards. For all other pollutants where there is an attainment standard, the Project area is classified as either in attainment or unclassified.

Yolo-Solano Air Quality Management District

The Project is under jurisdiction of the Yolo-Solano Air Quality Management District (the Air District), which regulates air quality according to the standards established in the aforementioned Clean Air acts and amendments to those acts (Figure 3.3-2). The Air District regulates air quality through permitting authority and through air quality related planning and review activities over most types of stationary emission sources. Stationary sources of pollution include industrial facilities, gasoline stations, auto body shops, and dry cleaners. The Air District is responsible for implementing emission standards for stationary sources, and for implementing other requirements of federal and State laws, coordinating with the Sacramento Metropolitan Air Quality Management District (SMAQMD) for issues related to the federal ozone standard, for which the region is in non-attainment. The District regulates agricultural burning and industrial emissions, implements transportation demand management measures, and recommends mitigation measures for new development to reduce automobile use. The Air District reviews CEQA documents and provides input with respect to assessing the level of impact of Project-related air quality emissions, and recommending proper mitigation.

The Air District, in conjunction with SMAQMD, periodically prepares and updates plans to achieve attainment goals, as required by the California Clean Air Act and Federal Clean Air Act. The District is required to adopt an Air Quality Attainment Plan and establish and enforce air pollution control rules and regulations in order to attain and maintain all state and federal ambient air quality standards. Typically, a plan will analyze emissions inventories and combine that information with air monitoring data to develop and plan future strategies to reduce emissions to achieve and maintain air quality standards.

In addition, the Air District assesses impacts related to toxic air emissions, and is in charge of monitoring and permitting sources of toxic air emissions, under the guidance of the Air Toxic Hot Spots Information and Assessment Act of 1987. Sources of toxic air pollutants are required to comply with conditions established in the Air District's stationary source permitting process.

Source: *State Water Quality Control Board web site,www.geotracker.ecointeractive.com: adapted by Cotton/Bridges/Associates, 2003*

Figure 3.3-1
Sacramento Valley Air Basin

Dry Cleaner Regulations

A dry cleaner has been identified as a potential use within the commercial areas on the western portion of the Project site. Special regulations apply to dry cleaners due to use of perchloroethylene (PERC), which is a hazardous air pollutant that in small concentrations can create an unpleasant odor and in large concentrations it can cause unconsciousness or death.

According to State law, dry cleaners using PERC must prepare complete emission inventory plans and reports. Sections 44390 through 44394 of the California Health and Safety Code require operators of certain facilities to perform an audit to identify the source of air toxics emissions and risk, and then develop and carry out a plan to reduce the emissions and risk. The facilities for which audits and plans are required are those that have air toxics emissions that are associated with a significant risk of harm to public health, as judged by an air pollution control district or air quality management district (district) through the Assembly Bill (AB) 2588 Air Toxics "Hot Spots" Program (AB 2588 Hot Spots Program). Once risk assessments are reviewed by Office of Environmental Health Hazard Assessment (OEHHA) and approved by the YSAQMD, facility operators must notify all exposed persons of the risk assessment results if the district determines that there is a potentially significant health risk associated with emissions from the facility.

The California Air Pollution Control Officers Association CAPCOA is developing an industry-wide risk assessment procedure to assist both the districts and facilities with emission inventory and risk assessment requirements. The requirements are focused on small businesses that are from the same industrial class, where individual compliance would impose severe economic hardships, and where emissions are easily and generically characterized. The procedure for dry cleaners has not yet been completed and the dry cleaning Airborne Toxics Control Measure (ATCM) is the regulation for PERC dry cleaning facilities.[5] This particular ATCM was granted federal equivalency by the U.S. Environmental Protection Agency (EPA). As a result, dry cleaners in California need only comply with the ATCM.[6]

Non-Attainment Pollutant Trends

Ozone concentrations from Vacaville air pollution monitoring stations are shown below, in Table 3.3-2. In general, ozone concentrations have been declining over the last 10 years, though an increase in ozone concentrations was experienced during 1998 and 1999. Future growth in the area will challenge the ability of the region to maintain and improve air quality, and especially ozone, which is mostly attributable to vehicular emissions.

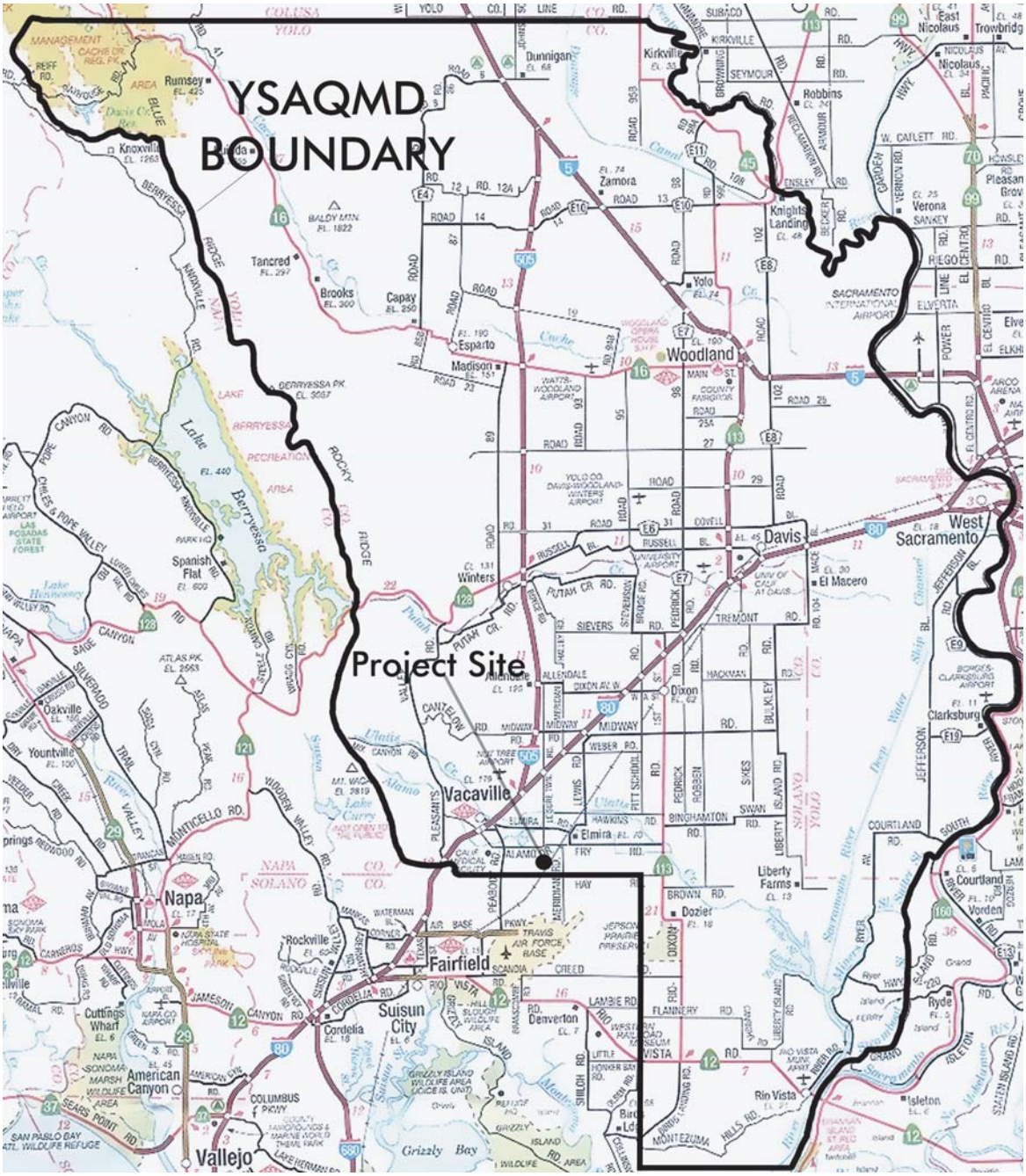

YSAQMD
BOUNDARY
Project Site
Woodland
Davis
West Sacramento
Vacaville
Fairfield
Napa
Vallejo
Suisun City
Winters
Dixon
Knights Landing
Rio Vista
Clarksburg
Courtland
Isleton
Ryde
Yolo
Zamora
Dunnigan
Esparto
Madison
Capay
Brooks
Tancred
Rumsey
Knoxville
Kirkville
Robbins
Verona
Pleasant Grove
East Nicolaus
Trowbridge
Nicolaus
Spanish Flat
Oakville
Yountville
Rockville
Cordelia
Cuttings Wharf
American Canyon
Elmira
Allendale
Liberty Farms
Dozier
Denverton
Grizzly Bay
Lake Berryessa
Lake Hennessey
Lake Curry
Sacramento International Airport
Sacramento Int'l Airport
Travis Air Force Base
Napa State Hospital
Napa Co. Airport
Yolo Co. Davis-Woodland-Winters Airport
Univ. of Calif. at Davis
Calif. Medical Facility
Jepson Prairie Preserve
Grizzly Island Wildlife Area
Solano Wildlife Area
Napa-Sonoma Marsh Wildlife Area
San Pablo Bay Natl. Wildlife Refuge
Cache Creek
Putah Creek
Sacramento River
Yolo Co.
Solano Co.
Napa Co.
Colusa Co.
Lake Co.
Sacramento Co.
Solano Co.
Yolo

Table 3.3-1
Air Pollution Standards, Sources, and Effects

Air Pollutant	State Standard	Federal Primary Standard	Sources	Primary Effects
Ozone (O_3)	0.09 ppm 1-hour avg.	0.12 ppm 1-hour avg.	Atmospheric reaction of organic gases with nitrogen oxides in sunlight	Aggravation of respiratory and cardiovascular diseases, irritation of eyes, impairment of cardiopulmonary function, plant leaf injury
Carbon Monoxide (CO)	9.0 ppm, 8-hour avg., 20 ppm, 1-hour avg.	9.0 ppm 8-hour avg. 35 ppm 1-hour avg.	Incomplete combustion of fuels and other carbon-containing substances such as motor vehicle exhaust, natural events, such as decomposition of organic matter	Reduced tolerance for exercise, impairment of mental function, impairment of fetal development, death at high levels of exposure, aggravation of some heart diseases (angina)
Nitrogen Dioxide (NO_2)	0.25 ppm, 1-hour avg.	0.053 ppm annual avg.	Motor vehicle exhaust, high-temperature stationary combustion, atmospheric reactions	Aggravation of respiratory illness, reduced visibility, reduced plant growth, formation of acid rain
Sulfur Dioxide (SO_2)	0.25 ppm 1-hour avg. 0.05 ppm 24-hour avg. with ozone > = 0.10 ppm, 1 hour avg. or TSP > = 100 $\mu g/m^3$ 24-hour avg.	0.03 ppm annual avg. 0.14 ppm 24-hour avg.	Combustion of sulfur-containing fossil fuels, smelting of sulfur-bearing metal ores, industrial processes	Aggravation of respiratory diseases (asthma, emphysema), reduced lung function, irritation of eyes, reduced visibility, plant injury, deterioration of metals, textiles, leather, finishes, coatings, etc.
Fine Particulate Matter (PM_{10})	30 $\mu g/m^3$, annual geometric mean; > 50 $\mu g/m^3$ 24-hour avg.	50$\mu g/m^3$ annual arithmetic mean 150 $\mu g/m^3$ 24-hour avg.	Stationary combustion of solid fuels, construction activities, industrial processes, industrial chemical reactions	Reduced lung function, aggravation of the effects of gaseous pollutants, aggravation of respiratory and cardio-respiratory diseases, increased coughing and chest discomfort, soiling, reduced visibility
Lead (Pb)	1.5 $\mu g/m^3$ 30-day avg.	1.5 $\mu g/m^3$ calendar quarter	Contaminated soil	Increased body burden, impairment of blood formation and nerve conduction
Visibility Reducing Particles	Sufficient to reduce visual range to less than 10 miles at relative humidity less than 70%, 8-hour avg. (9am - 5pm)			Visibility impairment on days when relative humidity is less than 70 percent

Notes: $\mu g/m^3$ = micrograms per cubic meter of air; ppm = parts per million of air, by volume.
Source: California Air Resources Board Web Site: www.ca.arb.gov

Table 3.3-2
Ozone Concentrations in Vacaville, 1995-2002

Yr.	1-Hr. Standard Exceedance Days		8-Hr. Standard Exceedance Days	1-Hr. Standard		8-Hr. Standard		Expected Peak Day[1]
	State	Fed.	Fed.	Max. Ozone	3-Yr. 4th High[2]	Max. Ozone	3-Yr. 4th High[3]	
2002	1	0	0	0.100	0.100	0.077	0.072	0.101
2001	2	0	0	0.104	0.110	0.081	0.077	0.112
2000	2	0	0	0.100	0.123	0.081	**0.085**	0.120
1999	8	**1**	**8**	**0.140**	0.123	0.106	**0.085**	0.121
1998	10	**2**	**7**	**0.137**	0.123	0.101	0.082	0.117
1997	3	0	0	0.105	0.106	0.083	N/A	0.113
1996	8	**1**	**2**	**0.126**	0.106	0.101	N/A	0.113
1995	6	0	**3**	0.115	0.102	N/A	N/A	0.114

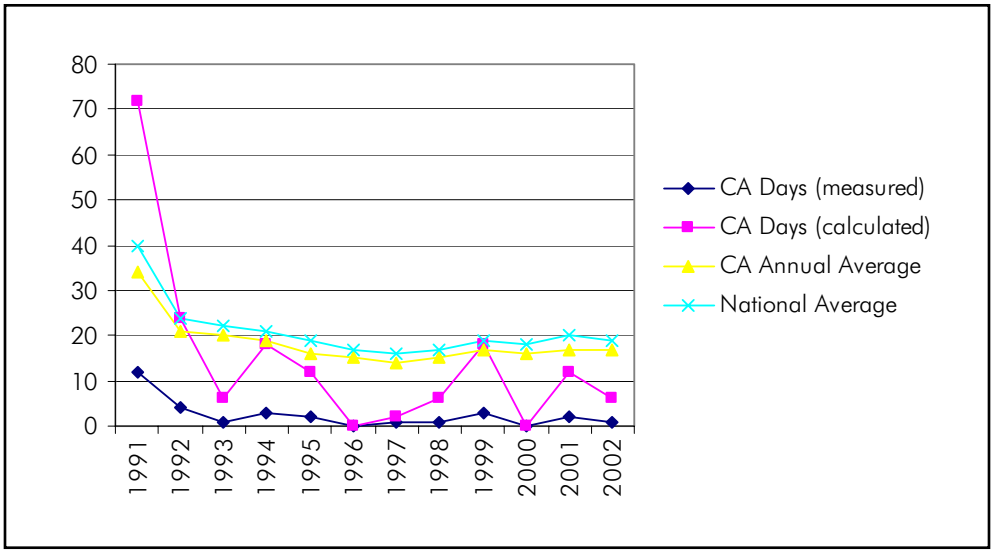
Notes:
State exceedances shown in underline. National exceedances shown in **bold**. An exceedance is not necessarily a violation. N/A = not available.

1. The EPDC is the "expected peak day concentration," a calculated concentration that represents the highest 1-hour ozone concentration expected each year. The EPDC is based on the observations within 3 consecutive years and is associated with the last year of the three consecutive years. It is expressed in parts per million.
2. The national 1-hour standard is violated when the fourth highest 1-hour observation, after rounding to two decimal places, over three years is greater than 0.12 parts per million. This column lists this fourth highest 1-hour observation and displays it in the last year of the three-year period.
3. The national 8-hour standard is violated when the average of the three annual fourth highest 8-hour averages (computed according to the method specified in Title 40 of the Code of Federal Regulations, Part 50, Appendix I) over three years is greater than or equal to 0.085 ppm (after truncation to 3 decimal places). This column lists this fourth highest 8-hour average and displays it in the last year of the three-year period. It is blank in those instances where there were both too few days in the three-year period with valid maximum 8-hour averages and the three-year average was below 0.085 ppm.

Source: California Air Resources Board web site, www.arb.ca.gov, 2002.

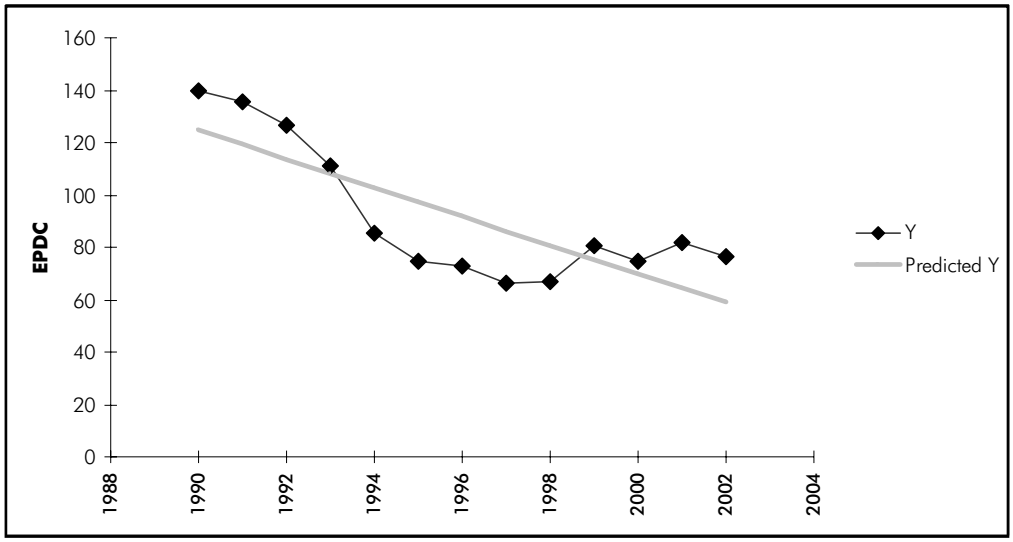
Identifiable trends in particulate matter concentrations are difficult to discern over the last 10 years. A general downward trend in the annual concentrations and exceedance days is noticeable, but several peaks complicate this overall trend (Figure 3.3-3). The estimated peak day concentration (EPDC) for PM_{10} shows an overall downward trend between 1990 and 2002, but a decrease in 1996 and 1997 was followed by an increase afterward (Table 3.3-3). The EPDC is a calculated concentration that represents the highest PM_{10} concentration in micrograms per cubic meter expected for each year based on the observations within three consecutive years. Ordinary least squares regression analysis on the EPDC between 1990 and 2002 predicts that for each year, the EPDC is reduced by approximately 5 micrograms per cubic meter (Figure 3.3-4).[7]

Figure 3.3-3
Annual PM_{10} Concentrations at Vacaville-Merchant Street Monitoring Station
(micrograms per cubic meter)



Source: California Air Resources Board web site, www.arb.ca.gov.

Figure 3.3-4
Estimated Peak Day PM_{10} Concentration at Vacaville–Merchant Street, 1990 - 2002
(micrograms per cubic meter)



Note: The Y represents the actual EPDC reported and the Predicted Y represents the EPDC as estimated by ordinary least squares regression analysis using year as the independent variable.
Source: California Air Resources Board web site, www.arb.ca.gov; Cotton/Bridges/Associates, 2003.

Table 3.3-3
Particulate Matter (PM_{10}) in Vacaville, 1988-2002

Year	Exceedance Days		Annual Avg.[1]		Max. Observation	3-Yr. Avg.[4]	Expected Peak Day Concentration
	State	Fed.	Geometric[2]	Arithmetic[3]			
2002	6	0	17.3	19.4	19	63	76.2
2001	12	0	17.8	20.2	19	77	81.7
2000	**0**	0	16.3	18.3	18	47	74.5
1999	18	0	17	19.8	18	66	80.3
1998	6	0	15.2	17.2	17	56	67.1
1997	2	0	14.5	16.1	17	74	66.5
1996	**0**	0	15.4	17.3	19	45	72.6
1995	12	0	16.8	19	21	62	74.7
1994	18	0	19.2	21.2	23	76	85.3
1993	6	0	20.3	22.4	29	53	111
1992	24	0	21.2	24.4	29	70	126.4
1991	72	N/A	34.9	40.6	29	98	135.8
1990	31	N/A	20.8	21	27	96	140.1
1989	26	N/A	31.1	24.7	N/A	109	N/A
1988	21	N/A	29.3	35	N/A	81	N/A

Notes:
State exceedances shown in underline. National exceedances shown in **bold**. An exceedance is not necessarily a violation.

1. These columns list the geometric and arithmetic annual averages. The California annual standard is exceeded when the annual geometric average of all values is greater than 30 micrograms per cubic meter. The national annual standard is based on the annual arithmetic average, and is exceeded when the average of three consecutive arithmetic averages is greater than 50 micrograms per cubic meter.
2. The annual geometric average is based on the highest 24-hour observations collected each day throughout the year. The California annual average standard is exceeded when the annual geometric average is greater than 30 micrograms per cubic meter.
3. The annual arithmetic average is based on the highest 24-hour observations collected each day throughout the year. This column displays the one-year arithmetic average calculated according to the techniques specified in Title 40, Part 50, Appendix K of the Code of Federal Regulations. The national annual average standard is exceeded when the average of three consecutive annual arithmetic averages is greater than 50 micrograms per cubic meter.
4. The 3-year average is the arithmetic average of three consecutive one-year arithmetic averages, calculated according to the techniques specified in Title 40, Part 50, Appendix K of the Code of Federal Regulations. The 3-year average is associated with the last year of the three consecutive years, and is blank where three consecutive years are not available. The national annual average standard is exceeded when the average of three consecutive annual arithmetic averages is greater than 30 micrograms per cubic meter.

Source: California Air Resources Board web site, www.arb.ca.gov, 2002.

Methodology

Since the Project includes residential and commercial uses rather than industrial uses, the primary air pollutants of concern during Project operation are exhaust emissions from vehicles, which vary according to driving speed, type of engine (gasoline or diesel), length of use, and available power.

The air quality impact assessment of the Project relies on assumptions about the type and duration of equipment used during construction, the timing and level of traffic generation on- and off-site, and the climate in the Project area, among other variables. To the extent that reasonable assumptions about Project site preparation, construction, and operation are available, these assumptions are used in determining air quality impacts.

Air quality modeling software, such as URBEMIS, is recommended by California air districts for assessing the level of air quality impacts of projects under CEQA. URBEMIS version 2001 was used in estimating the total operational air quality emissions associated with the Project. In addition, the CALINE 4 air quality modeling software is used in assessing carbon monoxide concentrations in the Project area, and the EMFAC emissions factor software is used to drive both of the aforementioned models.

The air quality impacts of the operational aspects of the Project were estimated using reasonable assumptions about the Project size, trip generation characteristics, and surrounding environmental characteristics. For some variables, such as the average summer temperatures, atmospheric stability, and fleet mix, URBEMIS defaults for the lower Sacramento Valley were used. Please refer to the air quality worksheets in Appendix B, for detailed information regarding the assumptions and techniques employed in the air quality analysis that supports this section of the EIR.

Thresholds of Significance

Impacts would be considered significant if the Project would:

- Conflict with or obstruct implementation of Sacramento Metropolitan Air Quality Management District Ozone Attainment Plan or any applicable Yolo-Solano Air Quality Management District Air Quality Attainment Plan;

- Cause or contribute to local carbon monoxide concentrations exceeding 20 parts per million (ppm) over a 1-hour average period or 9 ppm over an 8-hour average period at worst-case locations near congested intersections;

- Expose sensitive receptors to toxic air contaminants that would adversely affect their health and well-being;

- Violate any air quality standard, or contribute substantially to an existing or projected air quality violation; or,

- Result in release of criteria pollutant emissions in the short- or long-term exceeding the following thresholds: 82 pounds per day for reactive organic gases or nitrogen oxides, 150 pounds per day for particulate matter; or, 550 pounds per day for carbon monoxide (Table 3.3-4).

Table 3.3-4
YSAQMD Thresholds of Significance

Criteria Pollutant	Threshold
Reactive Organic Gases (ROG)	82 pounds per day
Oxides of Nitrogen (NO_x)	82 pounds per day
Fine Particulate Matter (PM_{10})	150 pounds per day
Carbon Monoxide (CO)	550 pounds per day

Source: YSAQMD, 2002.

Environmental Impact and Mitigation Measures

The following is a description of the environmental impact of the Project relating to local and regional air quality. If the environmental impact is determined to be significant, using the thresholds described previously, mitigation measures are provided.

Impact AQ-1 Short-Term Construction Related Emissions

The operation of construction equipment will produce nitrogen oxides (NO_x) and reactive organic gases (ROG), and site grading will produce fugitive dust emissions (PM_{10}). Short-term emissions occur during the construction of a project. Emissions occur in two distinct phases: Phase I is the grading phase of construction, and Phase II involves construction of structures and supportive infrastructure.[8] Table 3.2-5 summarizes the short-term construction impact of the Project, including an assessment relative to Air District thresholds of significance.

According to phasing plans, 222 single-family units fronting on Nut Tree Road, a 223-unit apartment complex fronting on Leisure Town Road, and 55 single-family units in Southtown Commons are proposed to be constructed in the first year, for a total of 500 units.

During the Phase I of project development, the project is estimated to exceed significance thresholds for NO_x. This is a **potentially significant** impact that requires mitigation. During Phase II, the emission of air pollutants is expected to be below significance thresholds.

Table 3.3-5
Estimated Peak Daily Emissions of
Criteria Air Pollutants During Site Preparation and Construction
(in pounds per day)

Emission Source	ROG	NO_x	PM_{10}
Phase I (Demolition and Site Grading)	20	234	210
YSAQMD Threshold	82	82	150
Exceed Threshold?	**NO**	**YES**	**YES**
Phase II (Project Construction)	72	15	18
YSAQMD Threshold	82	82	150
Exceed Threshold?	**NO**	**NO**	**NO**

Notes: N/A = not applicable. The architectural coatings function of URBEMIS has an error that prevents ROG impacts from architectural coatings from being assessed. Sacramento Metropolitan Air Quality Management District provides worksheets for estimating the ROG impacts of architectural coatings, which were used for this analysis (assumed to be painted 20 units at a time). ROG impacts estimated at 57.4 pounds per day. Figures rounded to nearest whole number after addition. ROG = reactive organic gases; NO_x = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter. It is assumed that no more than 500 housing units will be developed at once (based on Vacaville's residential allocation system).

Source: URBEMIS 2001 modeled output; Cotton/Bridges/Associates, 2003.

Mitigation Measure AQ-1

1. **Project contractors shall water all soil piles on-site at least twice daily unless they are covered or enclosed**
2. **Project contractors shall water all exposed soil at least twice per day during grading and construction**
3. **Project contractors shall water all haul roads at least twice per day during grading and construction**
4. **Maintain heavy-duty earthmoving, stationary, and mobile equipment in optimum running conditions.**
5. **Project contractors shall ensure emissions from all off-road diesel powered equipment used on the project site do not exceed 40 percent opacity for more than three minutes in any one-hour. An enforcement plan shall be established for weekly evaluation of Project-related on- and off-road heavy-duty vehicle engine emission opacities, using standards as defined in California Code of Regulations, Title 13, and Sections 2180 - 2194. An Environmental Coordinator, CARB-certified to perform Visible Emissions Evaluations (VEE), shall routinely evaluate Project-related off-road and heavy duty on-road equipment emissions for compliance with this requirement. YSAQMD may conduct periodic site inspections to determine compliance. Any equipment found to exceed the opacity requirement requires repair or replacement within 72 hours.**
6. **Construction equipment that uses combustion engines shall limit idling time to not more than five minutes.**

7. **Project contractors shall provide a plan demonstrating that the heavy-duty (> 50 horsepower) off-road vehicles to be used in the construction Project will achieve a fleet-average 20 percent NO_x reduction compared to the most recent CARB fleet average. The plan requires the approval of the YSAQMD prior to approval of tentative maps. The required reduction can use several methods of reduction, including, but not limited to the following:**
   - **Construction contracts shall stipulate that at least 20 percent of the heavy-duty off-road equipment included in the inventory be powered by CARB certified off-road engines, as follows: 175 horsepower (hp) - 750 hp, 1997 and newer engines; 100 hp - 174 hp, 1998 and newer engines; 500 hp - 99 hp, 1999 and newer engines.**
   - **Construction contracts can require the use of emulsified diesel fuel and or particulate matter traps.**

The effectiveness of certain mitigation is quantified by the URBEMIS 2001 model (Table 3.3-6):

Table 3.3-6
Effectiveness of Selected Mitigation Measures

Mitigation Measure	ROG	NO_x	PM_{10}
Proper maintenance of stationary equipment	5%	5%	5%
Proper maintenance of mobile equipment	5%	5%	5%
Low VOC Asphalt	5%	0%	0%

Note: It is assumed that proper maintenance of grading equipment would reduce grading equipment NO_x by 5 percent also.
Source: URBEMIS 2001.

Enclosing or watering piles of exposed soil would reduce particulate matter emissions by approximately 16 percent; watering all exposed soil reduces particulates by approximately 37 percent; and, watering haul roads provides about a 3 percent reduction.[9] Therefore, fine particulate matter emissions would be reduced below Air District thresholds with incorporation of the identified mitigation. Even with mitigation, the short-term impact during grading of oxides of nitrogen would exceed significance thresholds. The impact is **significant and unavoidable**.

Impact AQ-2 Operational Emissions

Table 3.3-7 summarizes Project impacts related to emission of carbon monoxide (CO), reactive organic gases (ROG), oxides of nitrogen (NO_X), and fine particulate matter (PM_{10}). Once operational, the Project is estimated to produce approximately 588 pounds per day of carbon monoxide, 78 pounds per day of nitrogen oxides, 124 pounds per day of reactive organic gases, and 123 pounds per day of particulate matter as a result of routine vehicle traffic, maintenance of landscaping, heating and cooling of proposed homes and businesses, and other activities. Air pollutant emissions exceed significance thresholds for carbon monoxide and reactive organic gases. This is a **potentially significant** impact that requires mitigation.

Table 3.3-7
Estimated Peak Long-Term Air Pollutant Emissions
(in pounds per day)

Source	Carbon Monoxide (CO)	Reactive Organic Gases (ROG)	Oxides of Nitrogen (NO_X)	Fine Particulate Matter (PM_{10})
Stationary Emissions	17	80	20	< 1
Vehicular Emissions	574	44	58	123
Total Emissions	588	124	78	123
YSAQMD Threshold	550	82	82	150
Exceed Threshold?	YES	YES	NO	NO

Notes: See Appendix B for worksheets. Trip generation for the Southtown and Southtown Commons projects is based on the City of Vacaville Traffic Model and the Institute of Transportation Engineers (ITE) *Trip Generation* (6th Edition). The Vacaville Model predicts 1,198 P.M. peak hour trips whereas the ITE *Trip Generation* predicts 1,641 P.M. peak hour trips. The EIR uses the ITE rates, resulting in 37% more trips and a more conservative estimate of the potential project impacts. It is assumed that no residential units will have normal wood-burning furnaces or fireplaces. Year analyzed is 2025 for operational impacts and 2020 for area sources (URBEMIS does not allow a year past 2020 to be entered). URBEMIS calculates wintertime and summertime emissions, and only the higher of the two seasons for each pollutant is displayed above.
Source: Modeled output from URBEMIS 2001 by Cotton/Bridges/Associates, 2003.

Mitigation Measure AQ-2

- **Structures developed in the proposed Project site shall use reflective roofing material designed to reduce summer heat absorption (such as EPA Energy Star roofing materials).**
- **City shall encourage efficiency ratings higher than Title 24 requirements.**
- **City shall require exterior electrical outlets installed on all buildings to promote use of electric operated landscaping equipment.**
- **Conventional open-hearth fireplaces shall not be permitted in residences proposed on-site. Only natural gas fireplaces, pellet stoves, or EPA-certified wood-burning fireplaces or stoves, shall be allowed in the residences.**
- **The Project shall accommodate any needs for bus stops, shelters, and other transit needs determined by the City to be necessary on-site.**

Even with incorporation of the mitigation identified above, the peak daily pollutant emissions may exceed the significance thresholds. The air quality impact attributable to operation of the proposed Project is **significant and unavoidable**.

Impact AQ-3 Carbon Monoxide Concentrations

Carbon monoxide (CO) concentrations can be caused by congested traffic intersections. Using the existing plus approved projects traffic scenario discussed in Section 3.13 of this EIR, the Project's traffic congestion impacts to the following intersections would be mitigated by measures included in this EIR and/or by the California Drive overcrossing project:

- Alamo Drive/Leisure Town Road/Fry Road

- Leisure Town Road/Vaca Valley Parkway/ I-80 Westbound Ramps
- Vanden Road/Cannon Road

The impact is considered **less than significant**. Cumulative carbon monoxide hot spot impacts are discussed in Section 5.0 of this EIR, Cumulative, Growth-Inducing, and Irreversible Impacts.

Notes and References

[1] Yolo-Solano Air Quality Management District. *Guidelines for Determining Air Quality Thresholds of Significance and Mitigation Measures for Proposed Development Projects that Generate Emissions from Motor Vehicles*. May 1996 (Revised 2002). Page 5.
[2] According to the *2002 Summary Report* from the Placer County Air Pollution Control District, page 24.
[3] City of Vacaville. *Alamo Place Subdivision Environmental Impact Report*. 1994.
[4] City of Vacaville. *Easterly Wastewater Treatment Plant Expansion EIR*. 1998.
[5] Mei Fong, California Air Resources Board. Personal correspondence, June 17, 2003.
[6] Refer to the California Air Resources Board web site, http://www.arb.ca.gov/toxics/dryclean.htm.
[7] The r square value is 0.63, which indicates that this simple regression analysis, using 1990 as year 1 and 2002 as year 13, captures most of the variation in EPDC among the 13 observations.
[8] YSAQMD. *CEQA Guidebook*. Revised 2002.
[9] Letter from Dan O'Brien of the Yolo-Solano Air Quality Management District to Sean Trippi of the City of Vacaville, dated July 21, 2003.

3.4 Biological Resources

This section of the EIR discusses the vegetation and wildlife resources at the Southtown Project site and the potential impacts of Project implementation on resources both on- and off-site. This section is based on the work of several biologists, but primarily the biological consulting firm, Environmental Collaborative.

Environmental Setting

Biological communities in the greater Solano County area include valley, coast range, and delta ecosystems, riparian forests, and grasslands. Vernal pool complexes are found within the southeastern part of the county. Oak woodlands interspersed with grasslands and chaparral occur in the rolling hills and mountainous western portion of the county. Salt and brackish marsh habitats occur along the fringe of Suisun Bay and the delta to the south. The majority of the level areas of Solano County are used for various types of agricultural production and urban development.

Vegetation and Associated Wildlife

The Southtown Project site has been used for crop production and irrigated pasture for decades, which has resulted in the elimination of any natural communities that originally occurred in the vicinity. Other than a row of mature blue gum eucalyptus (*Eucalyptus globules*) planted as windrows, volunteer black walnut trees (*Juglans hindsii*) along roadways, and a few ornamental trees and shrubs around the few farm residences, the Project site supports mostly non-native annual grasses and forbs typical of irrigated pastures and field margins. Dominant species include: Italian rye (*Lolium multiflorum*), Mediterranean barley (*Hordeum marinum*), soft chess (*Bromus hordeaceous*), dallis grass (*Paspalum dilatum*), clovers (*Trifolium* spp.), morning glory (*Convolvulus arvensis*), and purple star thistle (*Centaurea calcitrapa*). Freshwater marsh vegetation occurs along the realigned Alamo Creek Channel, Brazelton Drain, and some segments of roadside ditches where runoff from pasture irrigation allows them to survive. Plant species associated with the roadside ditches include cattail (*Typha* spp.), nutsedge (*Cyperus eragrostis*), may weed (*Anthemus cotula*), bristly ox-tongue (*Picris echiodies*), and rabbits-foot grass (*Polypogon monspeliensis*).

The lack of protective cover in the agricultural fields limits their importance and use as habitat for wildlife. A few species are able to utilize these marginal habitat areas, including California vole, California ground squirrel, black-tailed jackrabbit, gopher snake, western fence lizard, killdeer, and king bird. Raptors such as American kestrel, marsh hawk, red-tailed hawk, Swainson's hawk, barn owl, and great-horned owl may occasionally forage or pass over the Project site, but the low prey population levels generally make it of poor value to these species. Areas supporting perennial cover such as the fields of irrigated pasture can periodically support higher densities of smaller mammals, which provide an important prey base for raptors.

The trees in the planning area provide nest locations, roosting substrate, and cover for wildlife, particularly birds. Typical bird species which may frequent landscaped areas and use the eucalyptus

windrow include: mourning dove, northern mockingbird, magpie, crow, American robin, house finch, European starling, and house sparrow. No raptor nests were observed in the trees on the Project site or adjacent properties during the field reconnaissance surveys.

The ruderal (weedy) cover along field margins supports smaller mammals and reptiles, and is occasionally used by several species of birds as seed becomes available. The field margins often serve as retreat cover for smaller wildlife as crops are harvested and fields disked. Species associated with the ruderal grasslands include those found in the agricultural fields, as well as occasional use by graniverous birds such as American gold finch and several species of sparrow.

Areas of perennial freshwater marsh, such as the Alamo Creek channel and Brazelton Drain, provide important cover for wildlife and nesting substrate for birds. Species observed along the well-vegetated drainages include red-winged blackbird, tricolored blackbird, pacific treefrog, and introduced bullfrog. The roadside ditches generally do not contain surface water for long enough periods to support well-developed marsh vegetation or associated wetland vegetation, and wildlife species found in these locations are typical of field margins and ruderal grasslands.

Special-Status Species

Special-status species are plants and animals that are legally protected under the State and/or Federal Endangered Species Acts or other regulations, as well as other species that are considered rare enough by the scientific community and trustee agencies to warrant special consideration, particularly with regard to protection of isolated populations, nesting or denning locations, communal roosts, and other essential habitat.[1,2] Species with legal protection under the Endangered Species Acts often represent major constraints to development, particularly when they are wide-ranging or highly sensitive to habitat disturbance and where proposed development would result in a "take"[3] of these species. Review of records maintained by the California Natural Diversity Data Base, together with other relevant information, indicates that historical occurrences of several plants and animals with special status have been reported from the Vacaville vicinity.

The primary information source on the distribution of special-status species in California is the California Natural Diversity Data Base (CNDDB) inventory, which is maintained by the Wildlife and Habitat Data Analysis Branch of the CDFG. The CNDDB inventory provides the most comprehensive statewide information on the location and distribution of special-status species and sensitive natural communities. Occurrence data is obtained from a variety of scientific, academic, and professional organizations, private consulting firms, and knowledgeable individuals, and entered into the inventory as expeditiously as possible. The occurrence of a species of concern in a particular region is an indication that an additional population may occur at another location if habitat conditions are suitable. However, the absence of an occurrence in a particular location does not necessarily mean that special-status species are absent from the area in question; only that no data has been entered into the CNDDB inventory. Detailed field surveys are generally required to provide a conclusive determination on presence or absence of sensitive resources from a particular location, where there is evidence of potential occurrence.

Plant Species

Numerous special-status plant species have been reported from the central valley and Vacaville vicinity. Those initially considered to have the greatest potential for occurrence on the Project site based on geographic range and general habitat characteristics are listed in Table 3.4-1. Most of these are considered rare (list 1B) by the California Native Plant Society (CNPS), but a few such as Contra Costa goldfield (*Lasthenia conjugens*), showy Indian clover (*Trifolium amoenum*) and soft bird's-beak (*Cordylanthus mollis* ssp. *mollis*) are listed as federally endangered and soft bird's beak is also State listed as rare.

Due to the extent of past and ongoing disturbance from agricultural production and drainage channel maintenance, the potential for occurrence of any special-status plant species on the Project site is considered very low to nonexistent. Many of the species which flower into the summer months would have been detectible during the field reconnaissance surveys by the EIR biologist and by the initial plant survey by the applicant's biologist in summer of 2003, but none were observed or have been reported from the Project site by the CNDDB. However, there is a remote possibility that several spring flowering species may occur in irrigated pastures and would have been undetectable during the time of the field surveys. The species of greatest concern is Contra Costa goldfield, which has been reported within less than a mile south of the Project site along the Union Pacific Railroad right-of-way. This species is particularly difficult to detect when it is not in flower, and has been reported from disturbed grasslands and pasturelands. The nearby occurrence was reported in 1974 from a roadside ditch along the railroad right-of-way, but has not been refound despite subsequent spring visits to the vicinity.

Animal Species

A number of bird, mammal, reptile, fish, and invertebrate species with special-status are known or suspected from the central valley and Vacaville vicinity. These include: Cooper's hawk (*Accipiter cooperi*), burrowing owl (*Athene cunicularia*), tricolored blackbird (*Agelaius tricolor*), Swainson's hawk (*Buteo swainsoni*), northern harrier (*Circus cyaneus*), white-tailed kite (*Elanus caeruleus*), prairie falcon (*Falco mexicanus*), American peregrine falcon (*Falco peregrinus anatum*), loggerhead shrike (*Lanius ludovicianus*), Suisun song sparrow (*Melospiza melodia maxillaris*), northwestern pond turtle (*Clemmys marmorata*), California red-legged frog (*Rana aurora draytonii*), giant garter snake (*Thamnophis couchi gigas*), Delta smelt (*Hypomesus transpacificus*), Central Valley steelhead (*Oncorhynchus mykiss*), Sacramento splittail (*Pognichthys macrolepidotus*), conservancy fairy shrimp (*Branchinecta conservation*), vernal pool fairy shrimp (*Brachinecta lynchi*), mid-valley fairy shrimp (*Branchinecta mesovallensis*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)., delta green ground beetle (*Elaphrus viridis*), Ricksecker's water scavenger beetle (*Hydrochara rickseckeri*), vernal pool tadpole shrimp (*Lepidurus packardi*), long-eared myotis (*Myotis evotis*), fringed myotis bat (Myotis thysanodes), Pacific western big-eared bat (*Plecotus townsendii townsendii*), salt marsh harvest mouse (*Reithrodontomys raviventris*), and Suisun shrew (*Sorex ornatus sinuosus*). Tables 3.4-2 through 3.4-5 provide information on the name, status, and preferred habitat for each of these species.

Table 3.4-1
Project Vicinity Special-Status Plant Species

Plant	Status (Fed/State/CNPS)	Habitat Characteristics	Distribution (Presumed Extirpated)	Flowering Period
Suisun marsh aster	-/-/1B	Brackish water marshes and swamps	Contra Costa, Napa, Sacramento, Solano	May-Oct.
Alkali milk-vetch	-/-/1B	Valley grassland, vernal pools, and playas	Merced, Solano, Yolo (Alameda, Contra Costa, Monterey, Napa, Santa Barbara, Santa Clara, San Francisco, San Joaquin, Stanislaus)	March-June
San Joaquin saltbrush	-/-/1B	Alkaline grassland and scrub	Alameda, Contra Costa, Colusa, Glenn, Merced, Napa, Sacramento, Santa Barbara, Yolo (Santa Clara, San Joaquin, Solano, Tulare)	April-Sept.
Soft bird's-beak	FE/SR/1B	Coastal salt marsh	Contra Costa, Marin, Napa, Solano	July-Nov.
Dwarf downingia	-/-/2	Vernal pools and grassland	Mariposa, Merced, Napa, Placer, Sacramento, Solano, Sonoma, Stanislaus, Tehama, South America	March-May
Adobe fritillaria	-/-/1B	Chaparral, woodland, grassland on adobe soil	Butte, Colusa, Glenn, Lake, Napa, Plumas, Solano, Tehama, Yolo Mendocino, Monterey, San Benito	Feb.-April
Contra Costa goldfield	FE/-/1B	Low flats and borders of vernal pools	Napa, Solano, (Alameda, Contra Costa, Mendocino, Santa Barbara, Santa Clara)	April-May
Delta tule pea	-/-/1B	Brackish water marshes and swamps	Alameda, Contra Costa, Fresno, Napa, San Benito, Santa Clara, San Joaquin, Solano	May-June
Legenere	-/-/1B	Vernal pools	Lake, Napa, Placer, Sacramento, San Mateo, Solano, Tehama (Sonoma, Stanislaus)	May-June
Mason's lilaeopsis	-/SR/1B	Brackish water marshes and swamps	Contra Costa, Napa, Sacramento, San Joaquin, Solano	June-Aug.
Trifolium amoenum Showy Indian clover	FE/-/1B	Valley grassland	Sonoma (Alameda, Mendocino, Marin, Napa, Santa Clara, Solano)	April-June

Notes:
Federal Status:
FE =Listed as "endangered" under the Federal Endangered Species Act.
State Status:
SE =Listed as "endangered" under CESA.
SR =Listed as "rare" under CESA.
CNPS Status:
1A =Plants of highest priority; plants presumed extinct in California.
1B =Plants of highest priority; plants rare and endangered in California and elsewhere.
2=Plants rare, threatened, or endangered in California; more common elsewhere.

None of the special-status animal species listed in Tables 3.4-2 through 3.4-5 have actually been reported by the CNDDB as occurring on the Project site, and suitable habitat was determined to be absent for most of these species. Suitable habitat for salt and brackish marsh, vernal pool, riverine, and open water species is absent from the Project site. A habitat suitability analysis was conducted and determined that suitable habitat for most of the invertebrate species is not present due to an absence of larval host plants, and the short-term ponding and effects of irrigation practices on aquatic habitat (refer to Appendix C). A habitat suitability and focused survey for special-status bat species was conducted for the existing farm complex on the Moody (a.k.a. Southtown Commons) site by the EIR bat specialist who concluded that no special-status bat species are present on the Project site.

Following the field reconnaissance surveys and habitat suitability analysis, a total of 12 of the species listed in Tables 3.4-2 through 3.4-5 were either observed on-site or are considered to have varying potential for use or occurrence on the Project site. Many of these are bird species which may occasionally forage in the vicinity but are not currently suspected to nest on the Project site, including western burrowing owl, Cooper's hawk, loggerhead shrike, northern harrier, peregrine falcon, prairie falcon, Swainson's hawk, tricolored blackbird, and white-tailed kite (refer to Table 3.4-2 for bird species). The Alamo Creek corridor and Brazelton Drain may support northwestern pond turtle, and there is a remote possibility that mid-valley fairy shrimp and vernal pool fairy shrimp could occur in the roadside irrigation ditches on the Project site. Information on the habitat characteristics and potential for occurrence of these species on the Project site is provided below.

It should be noted that there remains a potential for occasional use of the Project site vicinity by other species of concern as well, such as Ferruginous hawk (*Buteo regalis*), long-billed curlew (*Numenius americanus*), mountain plover (*Charadrius montanus*), Aleutian Canada goose (*Branta canadensis leucopareia*), merlin (*Falco columbarius*), and sharp-shinned hawk (*Accipiter striatus*). This, however, would be limited to occasional wintering activity by migratory bird species or possible occasional foraging activity by species for which essential breeding habitat is absent from the Project site.

Swainson's Hawk

Swainson's hawk is a summer breeding resident of the central valley, generally occurring in areas where riparian woodland and surrounding agricultural lands provide roosting, nesting, and foraging habitat. The loss of nesting and foraging habitat has greatly reduced the breeding range and abundance of Swainson's hawk in California. Originally adapted to open grasslands, it has become increasingly dependent on agricultural lands as native plant communities have been converted to agricultural uses.

Agricultural crop patterns currently influence the distribution and abundance of Swainson's hawk in the Central Valley, and foraging behavior reflects changes in prey density and availability. Swainson's hawk is an opportunistic feeder, foraging in different areas as agricultural practices expose prey or prey populations become abundant. Suitable foraging habitat currently includes open grassland, lightly-grazed dryland or irrigated pasture, alfalfa and other hay crops, fallow fields, and combinations of hay, grain, and row crops such as tomato and beets. Unsuitable foraging habitat includes any crop-type in which prey are inaccessible, or which do not support adequate prey populations, such as vineyards, orchards, and cotton fields.

Records maintained by the CNDDB indicate several active nests and sightings of Swainson's hawk in the southeast Vacaville vicinity, although no active nest have been reported from the immediate vicinity of the Project site or were observed during the field reconnaissance surveys by the EIR biologist. The closest known nest location is from the Cypress Lakes Golf Course on the east side of the railroad right-of-way, approximately one-half mile east of the eastern edge of the Project site. Other active nests reported in the surrounding area include several nests in the vicinity of Elmira, approximately two miles northeast, and other nest sightings east of Lewis Road and northeast of Elmira. No evidence of nesting by Swainson's hawk or other raptors was observed in the few trees on the Project site and surrounding lands during the field reconnaissance surveys, although there is a potential that new nests could be established if construction is not initiated prior to the return of this species in spring of 2004.

Two basic criteria are generally used by the CDFG in determining whether a particular area is considered to provide potential foraging habitat for Swainson's hawk which must be mitigated for if converted to urban development (CDFG, 1997). These criteria include: (1) location within a 10-mile radius of an active nest site, and (2) suitable foraging habitat type. All of the Project site falls within a 10-mile radius of several known nesting territories in the southeast Vacaville vicinity, and most of the Project site provides suitable foraging habitat, particularly the irrigated pasture.

Burrowing Owl

Burrowing owl is a small, ground nesting owl which typically occupies underground burrows dug by California ground squirrels and other rodents. The habitat characteristics of burrowing owl includes lowland, dry, and arid grasslands throughout California. The occurrence of this species in Solano County is generally associated with agricultural areas, with nesting occurring along ditch and canal banks, railroad right-of-ways, and other set aside areas that provide suitable nesting burrows and hiding cover.

No occurrences of burrowing owl have been reported from the southeast Vacaville vicinity. The closest occurrence reported by the CNDDB is several miles to the southwest near Cement Hill in Fairfield and from Travis Air Force Base to the south and southeast. Very few ground squirrel colonies occur on the Project site, and no evidence of any burrowing owl nesting or foraging activity was detected during the field reconnaissance surveys. However, there is a possibility that individuals could establish new nests on the Project site prior to initiation of construction activities.

Tricolored Blackbird

Tricolored blackbird is a colonial nesting species, that is widespread in marshes and agricultural fields of the central valley. This species has been in decline since the 1930s as a result of loss of wetland habitat used for nesting, conversion of foraging habitat, disturbance and mortality by predators and humans, destruction of colonies by agricultural practices, and poisoning. Tricolored blackbirds typically nest in large flocks in dense vegetation near open water or in emergent wetland vegetation. During the non-breeding season, the blackbird utilizes more open habitats such as croplands and grassy fields.

Several tricolored blackbird individuals were observed in small thickets of cattail along the Alamo Creek channel north of the Southtown Commons portion of the Project site, about 200 feet east of the Leisure Town Road overcrossing. The emergent marsh vegetation along Alamo Creek and

segments of the Brazelton Drain provide suitable nesting habitat for this species, but no large colonies have been reported by the CNDDB from the southeast Vacaville vicinity.

Other Bird Species

There is also a possibility that one or more other special-status bird species could establish nests on the Project site, all of which would be protected by the Migratory Bird Treaty Act when in active use. No nests were observed during the field reconnaissance surveys, but nests could be established in the future before construction proceeds. This includes nesting by white-tailed kite, northern harrier, and loggerhead shrike, all of which are recognized as California Special Concern (CSC) species by the CDFG. The few trees also provide suitable nesting habitat for more common raptors, such as red-tailed hawk, great horned owl, and American kestrel. Additional detailed surveys would be necessary prior to construction to confirm presence or absence of any nesting activity, and this could change in the future as nests are abandoned and new nests established.

Table 3.4-2
Project Vicinity Special-Status Birds

Species	Status		Preferred Habitat Type
	Federal	State	
Western burrowing owl	FSC	CSC	Grassland and agricultural fields
California black rail	FSC, FP	ST	Salt marsh
California clapper rail	FE/ FP	SE	Salt marsh
Cooper's hawk	-	CSC	Riparian, woodland, and grassland
Golden eagle	-	CSC, CP	Open grassland, savanna, and agricultural fields
Loggerhead shrike	FSC	CSC	Grassland and agricultural fields
Northern harrier	-	CSC	Grassland and agricultural fields
Peregrine falcon	Delisted	SE, CP	Open water and grassland
Prairie falcon	-	CSC	Salt and brackish water marsh
Salt marsh yellowthroat	-	CSC	Riparian and grassland
Suisun song sparrow	FSC	CSC	Salt and brackish water marsh
Swainson's hawk	FSC	ST	Grasslands and agricultural fields
Tricolored blackbird	FSC	CSC	Freshwater marsh and fields
White-tailed kite	-	CP	Grassland and agricultural fields

Notes:
Federal Status:
FE =Listed as "endangered" under the FESA.
FT =Listed as "threatened" under the FESA.
C =A candidate species under review for federal listing.
FSC =Federal Special Concern species.
FP = Proposed for Federal listing as endangered.

State Status:
SE =Listed as "endangered" under CESA.
ST =Listed as "threatened" under CESA.
CP =California fully protected or protected species; individual may not be possessed or taken at any time.
CSC =California Special Concern species by the CDFG; species have no formal legal protection but nest sites and communal roosts are generally recognized as significant biotic features.

Northwestern Pond Turtle

The Northwestern pond turtle typically occurs in ponds and streams with permanent pools used as retreat habitat. No northwestern pond turtle was observed along Brazelton Drain or Alamo Creek during the field reconnaissance surveys, but it is possible that they may be present but were undetectable due to the dense emergent marsh vegetation. The closest reported occurrence of pond turtle is from Lagoon Valley to the west, although this species is most likely more widespread in perennial drainages in the Vacaville vicinity. Turtles could also move into these channel systems prior to initiation of construction. Additional detailed pre-construction surveys would be necessary to confirm presence or absence of pond turtle where disturbance to these features is proposed. Table 3.4-3 summarizes amphibians, reptiles, fish species that could potentially occur in the wider Project vicinity.

Table 3.4-3
Project Vicinity Special-Status Amphibians/Reptiles/Fish

Species	Status		Preferred Habitat Type
	Federal	State	
California tiger salamander	C	CSC, CP	Vernal pools, ponds, streams and adjacent grassland
California red-legged frog	FT	CSC, CP	Ponds, streams, adjacent riparian and upland
Delta smelt	FT	ST	Brackish zone of Delta; adjacent freshwater zones for spawning
Foothill yellow-legged frog	FSC	CSC, CP	Permanent streams with cobbles
Giant garter snake	FT	ST	Freshwater marsh, drainages, riparian and adjacent grassland
Sacramento splittail	FT	CSC	Sloughs and other slow-moving waters of Delta
Northwestern pond turtle	FSC	CSC, CP	Pond, rivers, and streams and adjacent grassland
Steelhead	FT	-	Open water of Bay and Delta, tributary rivers and streams
Winter- run chinook salmon	FE	SE	Open water of Bay and Delta, tributary rivers and streams

Notes:
Federal Status:
FE =Listed as "endangered" under the FESA.
FT =Listed as "threatened" under the FESA.
C =A candidate species under review for federal listing.
FSC =Federal Special Concern species.
State Status:
SE =Listed as "endangered" under CESA.
ST =Listed as "threatened" under CESA.
CP =California fully protected or protected species; individual may not be possessed or taken at any time.
CSC =California Special Concern species by the CDFG; species have no formal legal protection but nest sites and communal roosts are generally recognized as significant biotic features.

Invertebrates

Suitable habitat for most special-status invertebrates is absent from the Project site (see Appendix C). Low quality habitat for vernal pool fairy shrimp and mid-valley fairy shrimp may occur on the Project site. These two species typically occur in playas or vernal pools, which are absent from the Project site and surrounding lands. Major threats to the survival of invertebrate species include rapid urbanization of the central valley, habitat loss, and alteration in water supply resulting from flood control projects and agriculture practices. In general, human activities have resulted in isolation and fragmentation of historically larger vernal pool complexes, which greatly increases the odds of extinction because of reduced gene flow, inbreeding, and susceptibility to chance events that have catastrophic results.

No invertebrate special-status species have been reported by the CNDDB from the Project site or immediate vicinity. The closest occurrence of mid-valley fairy shrimp and vernal pool fairy shrimp is reported from several vernal pools approximately 2.5 miles to the southeast near Airbase Parkway and Walters Road. The summer irrigation of the fields on the Project site probably makes the ditches and man-made depressions unsuitable for these native vernal pool invertebrates. Fairy shrimp actively swim and feed in the water column of seasonally-ponded wetlands, and would most likely not be able to perform these activities in the vegetation-clogged ditches on the Project site. The ditches and two depressions on the Southtown Commons portion of the Project site are fed by irrigation runoff and remain saturated at a time of year that is out-of-season with the life cycles of these species, which require a dry season for formation of egg cysts. For these reasons, the ditches and depressions on the Project site are generally considered unsuitable as habitat for these invertebrates. However, there remains a remote possibility that conditions allow for the existence of one or both of these species, which have been reported from roadside ditches before. Consultation with the USFWS would be necessary to determine the need for protocol surveys to verify presence or absence of these species on the Project site.

Other Species

Mammals that could potentially occur in the wider Project vicinity are summarized in Table 3.4-5.

Table 3.4-4
Project Vicinity Special-Status Invertebrates

Species	Status		Preferred Habitat Type
	Federal	State	
Conservancy fairy shrimp	FE	-	Vernal pools, swales, and depressions in grassland
Vernal pool fairy shrimp	FT	-	Vernal pools, swales, and depressions in grassland
Mid-valley fairy shrimp	FSC/-	-	Vernal pools, swales, and depressions in grassland
Valley elderberry longhorn beetle	FT/-	-	Elderberry shrubs in riparian woodlands and field margins
Delta green ground beetle	FT/-	-	Shoreline of vernal pools in grassland
Ricksecker's water scavenger beetle	FSC/-	-	Shallow margins of ponds, streams, marshes
Vernal pool tadpole shrimp	FE/-	-	Vernal pools with prolonged inundation

Notes:
Federal Status:
FE =Listed as "endangered" under the FESA.
FT =Listed as "threatened" under the FESA.
C =A candidate species under review for federal listing.
FSC =Federal Special Concern species.

Table 3.4-5
Project Vicinity Special-Status Mammals

Species	Status		Preferred Habitat Type
	Federal	State	
Fringed myotis bat	FSC	CSC	Forages over grasslands and roosts in trees, buildings, caves
Long-eared myotis	FSC	CSC	Forages over grasslands and roosts in trees, buildings, caves
Pacific western big-eared bat	FSC	CSC	Forages over grasslands/riparian and roosts in caves, buildings
Salt marsh harvest mouse	FE	SE	Salt marsh and adjacent grassland
Suisun shrew	FSC	CSC	Salt marsh

Notes:
Federal Status:
FE =Listed as "endangered" under the FESA.
FT =Listed as "threatened" under the FESA.
C =A candidate species under review for federal listing.
FSC =Federal Special Concern species.

State Status:
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CSC =California Special Concern species by the CDFG; species have no formal legal protection but nest sites and communal roosts are generally recognized as significant biotic features.

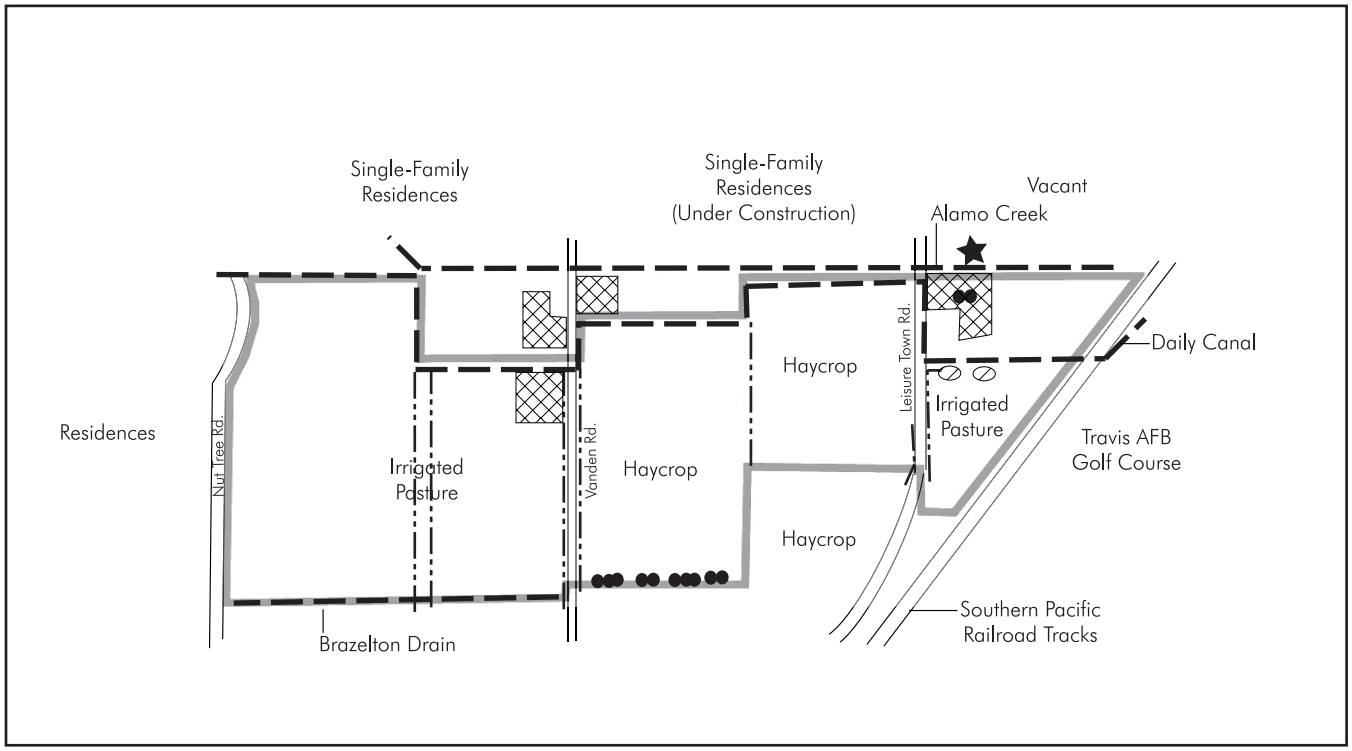
Wetlands

Although definitions vary to some degree, wetlands are generally considered to be areas that are periodically or permanently inundated by surface or ground water, and support vegetation adapted for life in saturated soil. Wetlands are recognized as important features on a regional and national level due to their high inherent value to fish and wildlife, use as storage areas for storm and flood waters, and water recharge, filtration and purification functions.

The CDFG and U.S. Army Corps of Engineers (Corps) have jurisdiction over modifications to wetlands and "Waters of the U.S." Jurisdiction of the Corps is established through the provisions of Section 404 of the Clean Water Act, which prohibits the discharge of dredged or fill material without a permit. Jurisdictional authority of the CDFG over wetland areas is established under Sections 1601-1607 of the Fish and Game Code, which pertains to activities that would disrupt the natural flow or alter the channel, bed, or bank of any lake, river, or stream.

A preliminary wetland delineation was conducted by the applicants' consulting wetland specialist (LSA, 2003) and peer reviewed as part of EIR preparation. Potential jurisdictional waters are limited to two small man-made depressions in the irrigated pasture on the Southtown Commons portion of the Project site, and the waters associated with Brazelton Drain, Dally Canal, and roadside and irrigation ditches on both the Southtown and Southtown Commons portion of the Project sites. The Project area does not extend north to the ordinary high water mark of Alamo Creek, but there is a possibility that the south bank of the creek could be modified as part of the project to allow for surface water discharge from the Southtown Commons portion of the Project site. Collectively the potential jurisdictional waters comprise a total of 5.052 acres on the Project site. On the Southtown Commons portion of the Project site, these consist of 0.047 acres associated with the man-made depressions, 0.095 acres of irrigation and tailwater ditches, and 0.57 acres associates with the Dally Canal. On the Southtown portion of the Project site, these consist of 0.94 acres of irrigation and tailwater ditches, and 3.40 acres associated with the Dally Canal and Brazelton Drain. An additional 0.89 acres of the Brazelton Drain between Vanden Road and the railroad right-of-way could be affected by proposed off-site drainage improvements proposed as part of the project.

The preliminary wetland delineation must still be verified by the Corps to accurately determine the extent of any potential jurisdictional waters that could be affected by the proposed project. The applicants' consulting wetland specialist concluded that the Dally Canal and Brazelton Drain are most likely considered jurisdictional as they historically would have been hydrologically connected to natural drainages. The irrigation and tailwater ditches may also be considered tributaries to Waters of the U.S. and subject to Section 404 regulations. However, there is a possibility that the ditches may be considered exempt from Corps regulations as man-made ditches constructed in uplands. Such exemptions are determined on a case-by-base basis, but some or all of the ditches may be determined by the Corps to be non-jurisdictional. Again, the extent of actual waters subject to Section 404 jurisdiction must still be determined by the Corps as part of their verification process.



Source: *Environmental Collaborative and Cotton/Bridges/Associates, 2003.*

Legend

- Project Site Boundary
- Main Drainage Channel
- Roadside Ditch
- Man-made Basin
- Eucalyptus Tree Locations
- Tri-color Blackbird Sighting
- Farmstead

No Scale

Figure 3.4-1
Biological Resources

Regulatory Setting

The following section describes relevant federal and State regulations governing biological resources that could be applicable to development of the Project site.

Special-Status Species Regulation

Federal and State regulations apply to special-status species, and are summarized below.

Federal Endangered Species Act

The Endangered Species Act (ESA) requires that Projects ensure their actions do not jeopardize the continued existence of species listed as endangered or threatened or result in the destruction or adverse modification of the critical habitat of these species.

California Endangered Species Act

The CDFG is responsible for protection and conservation of fish and wildlife resources in California. Under the California Endangered Species Act of 1984 (CESA), CDFG is responsible for ensuring that Projects do not adversely affect a species listed as endangered or threatened under CESA (Section 2090 of the Fish and Game Code).

The State and Federal Endangered Species Acts (CESA and FESA) are intended to operate in conjunction with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend. The USFWS is responsible for implementation of the FESA, while CDFG implements CESA.

Native Plant Protection Act

The legal protection afforded listed plants under the Native Plant Protection Act involves provisions that prohibit the taking of plants from the wild and a salvage requirement for landowners. Once they have been notified of the presence of a listed species on their property, landowners are required to tell CDFG at least ten days prior to any land use change. This allows for the salvaging of plants that would otherwise be destroyed.

California Environmental Quality Act

In addition to formal listing under FESA and CESA, plant and wildlife species receive additional consideration during the CEQA process. Section 15380 of the CEQA Guidelines includes provisions which serve to protect species considered to be of special-status by the scientific community but which have not yet received formal listing by the CDFG or USFWS. In addition, essential habitat for species maintained on the CDFG list of California Special Concern (CSC) species, is also considered sensitive under CEQA and must be considered during environmental review.

Migratory Bird Treaty Act / Fish and Game Code

Raptors (birds of prey), migratory birds, and other avian species are protected by both State and federal laws. Disturbance to nesting raptors is prohibited by Section 3503 of the California Fish and Game Code and by the Federal Migratory Bird Treaty Act (MBTA). Section 3503.5 of the California Fish and Game Code states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

The MBTA states that it is "unlawful to take any migratory bird listed in 50 CFR (10), including nests, eggs, or products." It prohibits the killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of Interior. Disturbance that causes nest abandonment is considered a "taking," and is prohibited.

Wetlands Regulations

Federal and State regulations apply to wetlands, and are summarized below.

Section 404 of the Clean Water Act

The Corps regulates discharge of dredged or fill material into waters of the United States, including wetlands, under Section 404 of the Clean Water Act (CWA). "Discharge of fill material" is defined as the addition of fill material into waters of the U.S., including, but not limited to, the following: placement of fill that is necessary for the construction of any structure or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §328.2(f)].

Waters of the U.S. include a range of wet environments such as lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, and wet meadows. Boundaries between jurisdictional waters and uplands are determined in a variety of ways depending on which type of waters is present. Methods for delineating wetlands and non-tidal waters are described below.

Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" [33 C.F.R. §328.3(b)]. Presently, to be a wetland, a site must exhibit three wetland criteria: hydrophytic vegetation; hydric soils; and wetland hydrology existing under the "normal circumstances" for the site.

The lateral extent of non-tidal waters is determined by delineating the ordinary high water mark (OHWM) [33 C.F.R. §328.4(c)(1)]. The OHWM is defined by the Corps as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" [33 C.F.R. §328.3(e)].

Section 401 of the Clean Water Act

In addition, Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant (including fill material) into waters of the United States to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards. The Regional Water Quality Control Board (RWQCB) is responsible for implementing Section 401 of the CWA.

Section 1600 – 1607 of the California Fish and Game Code

The CDFG has jurisdiction under Section 1600 *et seq.* of the California Fish and Game Code over fish and wildlife resources of the State. Under Section 1603, a private party must notify the CDFG if a proposed Project will "substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds...except when the department has been notified pursuant to Section 1601." If an existing fish or wildlife resource may be substantially adversely affected by the activity, the CDFG may propose reasonable measures that will allow protection of those resources. If these measures are agreeable to the party, they may enter into an agreement with the CDFG identifying the approved activities and associated mitigation measures.

Vacaville General Plan Conservation Element

General Plan policies from the Conservation Element applicable to the Southtown Project include:

> ***Policy 8.1-G 1***
> Preserve and enhance Vacaville's creeks for their value in providing visual amenity, drainage, and wildlife habitat.
>
> ***Policy 8.1-G 3***
> Where possible, integrate creeks with trails and other recreational open space. Encourage provision of public access to creek corridors.
>
> ***Policy 8.1-G 4***
> Preserve and protect water resource areas, including the Alamo, Encinosa, Gibson, and Ulatis Creek watersheds.
>
> ***Policy 8.1-I 2***
> Continue to impose creek setback standards on new development.
>
> ***Policy 8.1-I 3***
> Discourage culverting of creeks of significance to the City.
>
> ***Policy 8.1-I 4***
> Develop standards requiring protection of creekways during construction, and restoration of creekways after construction.
>
> ***Policy 8.1-I 5***
> Protect existing stream channels by requiring buffering or landscaped setbacks and storm runoff interception.

Policy 8.1-I 6
Consider the establishment of maintenance districts to ensure uniform maintenance for selected channels and creeks.

Policy 8.2-I 1
Require preservation or, where preservation is not possible, replacement of riparian vegetation.

Policy 8.2-I 3
Provide wildlife corridors, where feasible, to enable free movement of animals and minimize wildlife-urban conflicts.

Policy 8.2-I 4
Continue to implement the City's existing regulations which protect mature trees and existing natural non-agricultural trees.

Policy 8.2-I 6
Identify areas of wetlands at the earliest possible stage of development application processing. Policies to protect and preserve wetland habitats shall be contained in the Resource Management Section of applicable Policy Plans

Policy 8.2-I 7
Work with the Solano County Water Agency and federal and state agencies to implement a Habitat Conservation Plan to identify and protect species on federal and state endangered and threatened species lists.

Methodology

The biological analysis performed for the Southtown Project considered all potential direct and indirect impacts to onsite biological resources as well as the site's contribution to the regional biological environment. The analysis utilized information from the CNDDB, National Wetland Inventory, CDFG, USFWS, the City of Vacaville, and the County of Solano, among other sources and on-site surveys. The Project's potential effects on biological resources identified within the biological analysis were compared with the thresholds of significance identified below to determine whether the Project would result in significant environmental impacts.

On-site resources were determined through a review of available information, conduct of field reconnaissance surveys, habitat suitability analysis, and detailed on-site surveys by the EIR biologists, and a peer review of the wetlands delineation and invertebrate habitat assessment conducted for the applicants by an independent biologist. Field surveys were conducted on June 15th, 18th, and 20th, 2003; July 3rd, 2003; and, August 7th, 2003. A habitat assessment for special-status invertebrates was conducted for the entire planning area on June 15, 2003 (see Appendix C), and a detailed survey was conducted for special-status bat species by the EIR bat specialists at the Southtown Commons portion of the Project site on August 7, 2003 (see Appendix C). A wetland delineation was prepared by the applicants' wetlands specialist (LSA, 2003) and reviewed by the EIR biologist. This information was used by the EIR biologist in describing existing resources, and served as a basis for evaluating the potential impacts of the proposed Project and the adequacy of recommended mitigation.

Thresholds of Significance

Biological resource impacts would be considered significant if the Project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;

- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy ordinance; or,

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or State conservation plan.

Environmental Impact and Mitigation Measures

Impact BIO-1: Substantial Adverse Impacts to Special-Status Species

Several special-status species could be affected by proposed development. These include Swainson's hawk, other raptors and special-status bird species, and western pond turtle. There is also a remote possibility that mid-valley fairy shrimp, vernal pool fairy shrimp, Contra Costa goldfield, and other spring-flowering special-status plant species could be affected if they occur on the Project site.

Habitat loss is the most significant threat to the remaining populations of Swainson's hawk, as agricultural practices change or agricultural lands are converted to urban uses and nest trees are destroyed. In the absence of adequate mitigation, the CDFG may consider the loss of foraging habitat and disturbance within five miles of known active nests to constitute "take" under Section 2081 of the California Endangered Species Act. Proposed development would eliminate all of the

existing 280 acres of potential Swainson's hawk foraging habitat on the Project site, which would most likely be considered a significant loss to the CDFG.

The CDFG has developed detailed mitigation guidelines in an effort to protect critical habitat for Swainson's hawk. The *Draft Mitigation Guidelines for Swainson's Hawk in the Central Valley of California* were prepared by the CDFG to provide information on recommended management, natural history and population status, nesting and foraging requirements, and mitigation criteria for Swainson's hawk, with a general goal of no net loss of breeding or foraging habitat. The guidelines are intended to provide lead agencies and project sponsors with an interim framework for developing adequate measures to mitigate the loss of habitat until a comprehensive habitat resource plan is completed by the CDFG or habitat conservation plans are implemented on a local level. The mitigation criteria specified in the guidelines include: consultation with representatives of the Department; restrictions on disturbance within one-half mile of a known nest site from March 1 through August 15; prevention of loss of nest trees, maintenance of sufficient foraging habitat to support breeding pairs and successful fledging of young; and restoration and enhancement of nesting and foraging habitat.

The proposed Project would result in the loss of potential nesting habitat for loggerhead shrike, burrowing owl, white-tailed kite, northern harrier, and other raptors on the Project site. Although no evidence of nesting by raptors was observed during the field reconnaissance surveys, there is a possibility that new nests could be established in the future. Destruction of a raptor nest in active use would be a violation of the Migratory Bird Treaty Act. Given the possibility that new nests could be established on the site in the future before construction is initiated, this impact is considered **potentially significant**, and would require a pre-construction survey and appropriate mitigation if nests are encountered. Protection of any active raptor nests until young have fledged would be adequate mitigation.

The freshwater marsh habitat along Alamo Creek and Brazelton Drain provide suitable habitat for tricolored blackbird and northwestern pond turtle. Although no turtles were observed during the field reconnaissance surveys, there is a possibility that they were undetectable or could move into the area prior to initiation of construction. Similarly, only a few individual tricolored blackbird were observed along Alamo Creek and none have been reported by the CNDDB from the Project site, but there is a possibility that large nesting colonies could be established in the future. Several aspects of the proposed project would affect suitable habitat for these species, including culverting of the segment of the Brazelton Drain west of Vanden Road on the Southtown portion of the Project site, off-site widening of this feature between Vanden Road and the Union Pacific Railroad right-of-way, and construction of drainage outfalls into the Alamo Creek channel from the Southtown Commons portion of the Project site.

Although the potential for occurrence of vernal pool fairy shrimp and mid-valley fairy shrimp is considered extremely remote, proposed development would eliminate the marginal habitat provided by roadside ditches and depressions if either of these species occur within the Project site. Loss of an occurrence of either of these species would be considered a significant impact requiring mitigation and authorization from the USFWS. Further consultation with the USFWS would be necessary to determine whether the marginal habitat is considered potential habitat and the need for replacement mitigation as part of any federal authorization, such as a Section 404 permit from the Corps.

Similarly, there is a remote possibility that Contra Costa goldfield or another special-status plant species that flowers early in the spring months could occur on the Project site and would have been undetectable during the field reconnaissance surveys. Although their presence is considered highly unlikely, a supplemental survey during the spring months would be necessary to confirm presence or absence of any special-status plant species on the Project site and need for any mitigation. If one or more populations of special-status plant species occurs on the Project site, further consultation and appropriate mitigation (including avoidance, salvage, and off-site habitat preservation) may be required, depending on species status and quality of the population.

Potential impacts on the Special-Status Species described above are **potentially significant** and require mitigation. No other special-status plant or animal species have been reported from the Project site or are suspected to occur in the vicinity due to the absence of suitable habitat.

Mitigation Measure BIO-1a

The applicants shall obtain all legally required permits from the USFWS, CDFG, RWQCB, Corps, and U.S. EPA and implement mitigation measures, as required by federal and State law, to avoid, minimize, or offset impacts to any species listed under either the State or federal Endangered Species Act or protected under any other State or federal law. Evidence that the applicant has complied with the requirements of these agencies shall be submitted to the Vacaville Community Development Department prior to issuance of any grading or building permits for the project.

Mitigation Measure BIO-1b

Mitigation for impacts to Swainson's hawk shall include preparation of a Project-specific plan to provide for replacement habitat, or participation in a County-wide effort to establish a program for habitat management and conservation of "threatened" and "endangered" species in Solano County. Participating agencies in Solano County have initiated preparation of a Habitat Conservation Plan (HCP) with objectives to include: evaluation of potential impacts of planned growth on taxa[4] of concern; identification of essential habitat and recommended habitat protection zones; establishment of a funding mechanism through which developers can provide replacement habitat while meeting the goal of no net loss of habitat value; and preparation of a long-range implementation program to carry out the mitigation measures adopted as part of the HCP. Until the County-wide HCP is completed, the project applicants shall be required to consult with the CDFG to determine whether potential impacts on Swainson's hawk nesting or foraging habitat would be considered significant, and shall prepare a Project-specific Swainson's Hawk Mitigation Plan, where required by the CDFG. A qualified biologist shall be retained to develop a plan which addresses on-site protection or replacement habitat for Swainson's hawk and generally complies with the most recent version of the CDFG *Draft Mitigation Guidelines for Swainson's Hawks in the Central Valley of California*. Aspects of any required mitigation plan shall include the following:

- **The plan should be prepared in consultation with and with the approval of the CDFG, and provide for a habitat management agreement with the CDFG which will ensure a highly productive foraging habitat in perpetuity for Swainson's hawk.**
- **Replacement habitat could be established by obtaining a conservation easement over suitable agricultural lands, specifying acceptable and unacceptable crop types, prohibiting**

rodent control, and possibly including management requirements for habitat enhancement such as planting and maintenance of fence rows.

- **A copy of the fully executed habitat management agreement with the CDFG should be submitted to the City of Vacaville Community Development Department prior to the issuance of any construction permit or initiation of Project site improvements, whichever occurs first.**

Upon effectuation of any County-wide and CDFG-approved Habitat Conservation Plan which provides a habitat management and conservation program for threatened and endangered species (including Swainson's hawk) and requires payment of developer mitigation fees for implementation, the Project applicants may elect to pay the specified fees prior to issuance of any construction permit or initiation of site improvements, whichever occurs first. Payment of these fees shall be in-lieu of entering into a separate habitat management agreement with the CDFG.

Mitigation Measure BIO-1c

Pre-construction nesting surveys for loggerhead shrike, tricolored blackbird, and raptors shall be conducted during the months of April through July prior to any destruction of suitable nesting habitat. Aspects of the pre-construction survey effort shall include the following:

- **The surveys shall be conducted by a qualified biologist no more than 30 days prior to initiation of grading and shall extend to 300 feet beyond the limits of either the Project site or the proposed off-site construction area, whichever is greater.**
- **If any of these species are found within the construction area after April of the construction year, grading and construction in the area shall either stop or continue only after the nests are protected by an adequate setback approved by a qualified biologist.**
- **If avoidance of nests is not feasible, impacts to foraging habitat for tricolored blackbird, kite, shrike, and raptor nests shall be minimized by avoiding disturbances to the birds during the nesting season unless a qualified biologist verifies that the birds have either a) not begun egg-laying and incubation, or b) that the juveniles from those nests are foraging independently and capable of survival at an earlier date.**
- **A survey report by the qualified biologist summarizing the results of the survey effort or verifying that any young have fledged shall be submitted to the Vacaville Community Development Department prior to initiation of grading in any nest-setback zone.**

Mitigation Measure BIO-1d

Pre-construction surveys for burrowing owl shall be conducted throughout the year to determine whether any nesting owls are present and to provide for their protection during the active breeding season or passive relocation during the non-breeding season if nests are encountered. Aspects of the pre-construction survey effort shall include the following:

- **The surveys shall be conducted by a qualified biologist no more than 30 days prior to initiation of grading and shall extend to 300 feet beyond the limits of either the Project site or the proposed off-site construction area, whichever is greater.**
- **The surveys shall be conducted by a qualified biologist and shall comply with *Burrowing Owl Protocol and Mitigation Guidelines*.**

- **If a colony of owls is encountered, a detailed mitigation program shall be prepared to address significant impacts. The detailed mitigation program shall be prepared in consultation with the CDFG and meet with the approval of the Vacaville Community Development Department prior to any grading or construction disturbance.**
- **A survey report by the qualified biologist summarizing the results of the survey effort, verifying that any young have fledged, or that the detailed mitigation program has been implemented shall be submitted to the Vacaville Community Development Department prior to initiation of grading in any nest-setback zone.**

Mitigation Measure BIO-1e

Pre-construction surveys for Western pond turtles shall be conducted throughout the year. Western pond turtles and any active nests for this species shall be avoided during construction. Aspects of the pre-construction survey effort shall include the following:

- **Inspection for western pond turtle and potential nests shall be conducted prior to any in-channel modifications to Alamo Creek and Brazelton Drain.**
- **If grading within 300 feet of either of these channels is scheduled during the active nesting period (April through November), a qualified wildlife biologist shall conduct a pre-construction survey for western pond turtle no more than 15 days prior to initiation of grading to provide confirmation on presence or absence of active nests in the vicinity.**
- **If active turtle nests are identified, a buffer area of 300 feet shall be established between the nest and the channel segment nearest the nest. Buffer areas shall be indicated by temporary fencing if construction has or will begin before the nesting period ends.**
- **If construction begins outside of the active nesting season, then a pre-construction survey shall not be required and no survey report shall be required prior to initiation of grading within 300 feet of these channels.**
- **A capture and relocation program for any turtles along these channels shall be performed by a qualified biologist prior to any in-channel disturbance. Any relocated turtle shall be placed in secure channel habitat outside the construction zone.**
- **A survey report by the qualified biologist summarizing the results of the survey effort or verifying that any nesting has been completed shall be submitted to the Vacaville Community Development Department prior to initiation of grading in any nest-setback zone.**

Mitigation Measure BIO-1f

Detailed surveys shall be conducted in spring (March and May) to confirm absence of any other special-status plant species from the Project site. Aspects of the supplemental special-status plant survey effort shall include the following:

- **If populations of any special-status plant species are encountered, a detailed mitigation program shall be prepared to address significant impacts on any listed species or those maintained on Lists 1B or 2 of the CNPS Inventory. Components of the mitigation program may include collection of seeds during the appropriate developmental stage of the plan, procedures for sowing techniques appropriate to the life cycle of the plant, securing permanent off-site habitat or an existing population, development of a maintenance and monitoring plan specific to the environmental conditions necessary for survival of the new**

population, identification of funding sources to provide for implementation of the plan, and management and maintenance of the mitigation area.

- **Potential impacts on any species maintained on Lists 3 and 4 of the CNPS Inventory would not be considered significant and no mitigation would be required for these species.**
- **The detailed mitigation program shall be prepared in consultation with the CDFG and meet with the approval of the Vacaville Community Development Department prior to any grading or seed collection on the Project site.**

After incorporation of these mitigation measures, the impact will be **less than significant**.

Impact BIO-2: Substantial Adverse Impacts on Sensitive Natural Communities

No sensitive natural communities recognized by the CDFG would be directly affected by the proposed Project, such as riparian woodland, native grasslands, or vernal pools. However, proposed development would result in the elimination of approximately 0.86 acres of emergent freshwater marsh vegetation along an approximately 2,500-foot segment of Brazelton Drain between Nut Tree Road and Vanden Road. Off-site drainage improvements would result in the regrading of an additional 2,500 feet of Brazelton Drain between Vanden Road and the Union Pacific Railroad right-of-way, resulting in the short-term elimination of the existing habitat values along this segment of the drainage as well. Although the Brazelton Drain is periodically disturbed by drainage maintenance activities, placing a large portion of the channel in a culvert would permanently eliminate the value it provides as wildlife habitat. While cattail-dominated freshwater marsh is not technically considered a sensitive natural community by the CDFG, the Brazelton Drain is important as perhaps the most valuable natural habitat on the Project site. Additional discussion of the potential impacts of the Project on this feature and recommended mitigation is provided below under Impact BIO-3, Wetlands.

With mitigation included under BIO-3, the impact is considered **less than significant**.

Impact BIO-3: Substantial Adverse Impacts on Wetlands

Potential impacts to wetlands would include direct modifications to jurisdictional waters to accommodate proposed development and drainage improvements, and indirect changes associated with the increased potential for erosion and water quality degradation. Potential erosion and degradation of the wetland and riparian habitat may result from increased urban runoff volumes and degraded water quality associated with proposed development. Proposed development would magnify the volume of runoff and potential for urban pollutants, with perhaps the greatest potential damage resulting from sedimentation during the construction phase of the Project and from new non-point discharge of automobile by-products, fertilizers, and herbicides into Alamo Creek and Brazelton Drain. These impacts and appropriate mitigation are discussed in detail in Section 3.12 of this EIR, Surface Hydrology and Water Quality.

As currently proposed, development would eliminate the existing system of irrigation and tailwater ditches, the man-made depressions on the Southtown Commons portion of the Project site, and the approximately 2,500-foot segment of Brazelton Drain between Vanden Road and Nut Tree Road which would be culverted. The segment of Brazelton Drain between Vanden Road and the Union

Pacific Railroad right-of-way would be re-graded and widened to accommodate Project-generated runoff from the Southtown portion of the Project site. Surface runoff from the Southtown Commons portion of the Project site would be discharged into Alamo Creek, requiring modifications to the bank of the channel.

Although the Corps has not performed a verification of the preliminary wetland delineation prepared by the applicants' consulting wetland specialist, the anticipated affects on potential jurisdictional waters can still be estimated. If all of the identified features are determined to be jurisdictional by the Corps, the proposed development would result in the elimination or modification of 5.942 acres of wetlands and unvegetated waters. Of this total, an estimated 0.91 acres would be the result of proposed culverting of the Brazelton Drain west of Vanden Road, and an additional 0.89 acres would be from the proposed widening of this feature between Vanden Road and the railroad right-of-way. Collectively, this represents a substantial acreage of potential jurisdictional waters which may require considerable mitigation to secure authorization from permitting agencies including the Corps, RWQCB, and possibly CDFG. Consideration should be given to revising the proposed Site Plan to reduce anticipated wetland loss by enhancing the Brazelton Drain east of Vanden Road as an open space feature along the southwest side of the Southtown Project site. If this channel remains unculverted and is improved as a natural drainage, this has the potential to reduce anticipated wetland loss by an estimated 0.86 acres, and to protect the wildlife habitat values associated with the existing marsh along the drainage.

As noted in the Surface Hydrology and Water Quality section of this EIR, a General Construction Activity Stormwater Permit will be required for Project development. Permit applicants are required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and implement source control BMPs to reduce construction effects on receiving water quality by implementing erosion control measures. Examples of construction BMPs identified in SWPPPs include: using temporary mulching, seeding or other stabilization measures to protect uncovered soils; storing materials and equipment to ensure that spills or leaks cannot enter the storm drain system or surface water; developing and implementing a spill prevention and cleanup plan, installing traps, filters, or other devices at drop inlets to prevent contaminants from entering storm drains; and using barriers, such as straw wattles or silt fencing, to minimize the amount of uncontrolled runoff that could enter drains or surface water.

Nonetheless, the impact is **potentially significant** and requires mitigation.

Mitigation Measure BIO-3a

The preliminary wetland delineation for the Project site shall be submitted by the applicants' consulting wetland specialist to the Corps for verification. If the identified drainages channels and ditches to be filled and modified are not considered jurisdictional then no additional mitigation is considered necessary. If these features are considered jurisdictional and must be filled, then a mitigation program shall be prepared by a qualified wetland specialist, and shall at minimum provide for permanent protection or creation of replacement habitat of greater or equal acreage and values at a secure location. The mitigation program involving wetland creation shall include:

- **Monitoring and management for a minimum of five years to ensure success of wetlands creation;**

- **Specify success criteria, maintenance, monitoring requirements, and contingency measures;**
- **Define site preparation and re-vegetation procedures, along with an implementation schedule, and funding sources to ensure long-term management.**
- **If required, the detailed mitigation program shall be prepared in consultation with the Corps and RWQCB, and meet with the approval of the Vacaville Community Development Department prior to initiation of any modifications to jurisdictional waters.**

With incorporation of identified mitigation, the impact is considered **less than significant**.

Impact BIO-4: Substantial Interference with Movement of Native Fish or Wildlife Species

Proposed development is not expected to interfere substantially with the movement of native wildlife or substantially diminish wildlife habitat values. Existing agricultural habitat would be converted to suburban development, displacing common wildlife species which currently utilize the Project site for foraging and other opportunities. Species common to suburban habitat, such as house finch, house sparrow, mourning dove, American robin, pocket gopher, and house mouse, would eventually occupy structures and landscape areas. Alamo Creek would remain as an open channel available to fish and wildlife in the area, and would not be obstructed by proposed improvements.

Measures recommended to address potential impacts on special-status species, particularly Swainson's hawk and preconstruction surveys for raptors and other birds would serve to mitigate for loss of the more sensitive wildlife habitat values of the Project site.

With mitigation required under Impact BIO-1, the impact is considered **less than significant.**

Impact BIO-5: Conflict with Local Policies or Ordinances Protecting Biological Resources

In general, the proposed Project would conform with local policies and ordinances related to protection of biological and wetland resources. Many of the policies relate to protection of creeks and their value in providing aesthetic and wildlife habitat values, including Policies 8.1-G 1, 3, and 4, Policies 8.1-I 2, 3, 4, 5, and 6, and Policy 8.2-I 1. The proposed Project would have minor direct impacts on Alamo Creek, limited to installation of drainage outfalls on the south bank north of the Southtown Commons portion of the Project site. Protections provided as part of further review by jurisdictional agencies and Mitigation Measures BIO-3a and BIO-3b would ensure any modifications to the creek channel are sufficiently mitigated.

While the Brazelton Drain is not a natural drainage, it does provide important wildlife habitat values and could be improved as an open space feature along the southwestern edge of the Southtown portion of the Project site rather than being culverted as currently proposed between Vanden and Nut Tree Roads. Mitigation Measure BIO-3c recommends retaining and enhancing this drainage channel as an open space feature, which would be consistent with the intent of the relevant General Plan policies.

As previously discussed, the applicants have retained a consulting wetland specialist to determine potential jurisdictional waters on the Project site, consistent with Policy 8.2-I 6. The preliminary wetland delineation will be submitted to the Corps for verification, which would then be used as a basis for developing any required wetland mitigation program.

Proposed development would require removal of the existing trees on the Project site. None of the trees on the Project site are naturally occurring native species such as valley oak, which are of particular concern to the City. Most are smaller sized trees planted around the existing farm residences in the northwestern corner of the Southtown Commons portion of the Project site and along Vanden Road on the Southtown portion of the Project site. Larger trees on the Project site include two mature blue gum eucalyptus on the Southtown Commons portion of the Project site and a row of blue gum eucalyptus grows along the southern edge of the Southtown portion of the Project site east of Vanden Road. Many of the eucalyptus are very large specimen trees, possibly the largest in the Vacaville vicinity. These mature eucalyptus do provide important perching, roosting, and possibly nesting substrate for a number of bird species, in an area where large trees are relatively scarce.

Chapter 14.09.131 of the Vacaville Zoning Code provides standards for tree preservation, which recognizes the value of existing trees and establishes a process to review and authorize removal of any protected trees. Priority for preservation is given to native tree species, but the regulations address any tree with a circumference of 31 inches or more (measured at 4.5 feet above ground level).

Policy 8.2-I 4 of the General Plan calls for continuing to implement the City's regulations to protect mature trees. Proposed development would remove all of the eucalyptus and other trees on the Project site, which would be inconsistent with the intent of Policy 8.2-I 4. Mature eucalyptus can pose a potential threat due to major limb drop or toppling, but the trees should be evaluated for suitability of preservation by a certified arborist and incorporated into the design of the proposed Project where feasible.

The impact to large trees is a **potentially significant** impact that requires mitigation.

Mitigation Measure BIO-5

- **The two mature blue gum eucalyptus trees in the northwest corner of the Southtown Commons portion of the Project site and the row of blue gum eucalyptus trees east of Vanden Road along the southern boundary of the Southtown portion of the Project site shall be evaluated by a certified arborist to determine their suitability for preservation.**
- **If these trees do not pose a significant risk to future residents and properties, the proposed Site Plan shall be revised to preserve these trees as part of proposed open space, to the extent feasible.**

With incorporation of identified mitigation, the impact is considered **less than significant**.

Impact BIO-6 Conflict with an Adopted Habitat Conservation Plan

The proposed Project would not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan. While a County-wide Habitat Conservation Plan is currently being prepared by participating agencies in Solano County, it has not been adopted and must still undergo a long process of refinement and agency approval. No adopted conservation plans encompass the Project site, and **no impact** would therefore occur as a result of the proposed development.

No mitigation is required.

Notes and References

1 Special-status species include:

- Officially designated (rare, threatened, or endangered) and candidate species for listing by the California Department of Fish and Game (CDFG).
- Officially designated (threatened or endangered) and candidate species for listing by the U.S. Fish and Wildlife Service (USFWS).
- Species considered to be rare or endangered under the conditions of Section 15380 of the CEQA Guidelines, such as those identified on lists 1A, 1B, and 2 in the *Inventory of Rare and Endangered Plants of California*.
- And possibly other species which are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status, such as those included on lists 3 and 4 in the CNPS *Inventory* or identified as animal "Species of Special Concern" by the CDFG. Species of Special Concern have no legal protective status under the state Endangered Species Act but are of concern to the CDFG because of severe decline in breeding populations in California.

2 The federal Endangered Species Act (FESA) of 1973 declares that all federal departments and agencies shall utilize their authority to conserve endangered and threatened plant and animal taxa. The California Endangered Species Act (CESA) of 1984 parallels the policies of FESA and pertains to native California taxa.

3 The USFWS and CDFG share responsibility for protection and management of natural resources. "Take" as defined by the FESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect" a threatened or endangered species. "Harm" is further defined by the USFWS to include the killing or harming of wildlife due to significant obstruction of essential behavior patterns (i.e., breeding, feeding, or sheltering) through significant habitat modification or degradation. The CDFG also considers the loss of listed species habitat as "take", although this policy lacks statutory authority and case law support under the CESA. Two sections of FESA contain provisions which allow or permit "incidental take." Section 10(a) provides a method by which a state or private action which would result in "take" may be permitted. The applicant must provide the USFWS with an acceptable conservation plan and publish notification for a permit in the Federal Register. Section 7 pertains to a federal agency which proposes to conduct an action which may result in "take," requiring consultation with USFWS and possible issuance of a jeopardy decision. Under the CESA, "take" can be permitted under Section 2081 of the Fish and Game Code. The applicant must enter into a habitat management agreement with the CDFG, which defines the permitted activities and provides adequate mitigation.

4 Taxa refers to the classification of plants and animals according to their presumed natural relationships

3.5 Cultural Resources

This section of the EIR evaluates the extent to which cultural and/or historic resources would be removed, damaged, or destroyed as a result of development of the proposed Project. A cultural and historical resource report is included as Appendix D to this DEIR.

Environmental Setting

Prehistoric Setting

Solano County was populated by a large contingent of the Patwin people upon the arrival of Europeans. The Patwin people, a Native American group of hunters, fishers, and gatherers, are considered to have controlled the area west of the Sacramento River to the crest of the Coast Ranges. Evidence of the semi-permanent villages inhabited by the Patwin has been identified within the hills near the City. The California Archaeological Inventory lists approximately two dozen archaeological sites within the Vacaville area, mainly associated with the foothills and along perennial creeks. There are no recorded archaeological sites identified within the Southtown site.

Historic Setting

The downtown area of Vacaville has been designated an historic district because of the presence of structures associated with settlement of the area in the early 1800s. The city contains approximately 200 identified historic structures, three of which are listed on the National Register of Historic Places. These structures include the Pena Adobe, the Will H. Buck House, and the Vacaville Town Hall, none of which are located near or within the Project site. There are no recorded historical resources on the Project site.

Regulatory Setting

The local, State, and federal regulatory setting related to cultural and historic resources is described below.

National Register Criteria for Evaluation

The National Register of Historic Places is the official list of properties, structures, districts, and objects significant in American history, architecture, archeology, engineering, and culture. National Register properties have significance to the prehistory and history of their community, State, or Nation.

National Register Bulletin #15 sets the professional standard for determining eligibility through a framework of property evaluation criteria. The California Office of Historic Preservation, Department of Parks and Recreation, notes that the California Register of Historic Resources was

"consciously designed on the model of the National Register, [and therefore] the two programs are extremely similar..." (*OHP Technical Assistance Series* #6, 1) The OHP technical assistance brief continues to explain that when trying to determine if a resource is eligible for the California Register it is helpful to first review the property using the National Register and then move on to determine if it may be eligible for the California Register.

Historic evaluation

The National Register Criteria for Evaluation is..."the basis for judging a property's significance for their association with important events or persons, for their importance in design or construction, or for their information potential..." (National Register Bulletin #15). The National Register Criteria recognizes the following categories:

- ***Associative Value; Criterion A:*** properties significant for their association or linkages to events.
- ***Associative Value; Criterion B:*** properties significant for their association to persons important to the past.
- ***Design or Construction Value; Criterion C:*** properties significant as representatives of the fabricated expression of culture or technology.
- ***Information Value; Criterion D:*** properties significant for their ability to yield important information about prehistory or history.

Bulletin 15 further explains that a determination must be made on how the theme of the context is significant in the history of the local area, the State, or the nation. "A theme is a means of organizing properties into coherent patterns based on elements such as environment, social/ethnic groups, transportation networks, technology, or political developments that have influenced the development of an area during one or more periods of prehistory or history. A theme is considered significant if it can be demonstrated, through scholarly research, to be important in American history. Many significant themes can be found in the list of Areas of Significance used by the National Register."

Evaluation of Integrity

Integrity is the measure by which properties are evaluated. To retain integrity a property must have most of the seven aspects of integrity as defined by the National Register Criteria for Evaluation. The seven aspects of integrity are quoted as follows:

- ***Location*** - Location is the place where the historic property was constructed or the place where the historic event occurred.
- ***Design*** - Design is the combination of elements that create the form, plan, space, structure, and style of a property.
- ***Setting*** - Setting is the physical environment of the historic property.
- ***Materials*** - Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration form a historic property.
- ***Workmanship*** - Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
- ***Feeling*** - Feeling is a property's expression of the aesthetic or historic sense of a particular period of time.

California Register Evaluation

Properties that are eligible for the National Register of Historic Places are also considered eligible for the California Register of Historical Resources. The California Register recognizes resources that are significant at the local, State, or national level. The four California criteria are quoted as follows:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;

2. It is associated with the lives of persons important to local, California, or national history;

3. It embodies the distinctive characteristics of a type, period, region, or method or construction, or represents the work of a master, or possesses high artistic values; or

4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

Vacaville General Plan

The Conservation Element of the Vacaville General Plan contains several policies that focus on the preservation of historical resources within the designated Historical Downtown area. Some policies apply to historical resources in general. Where applicable, the Southtown project is required to comply with the General Plan policies listed below.

- 8.5-G 1 – Continue to protect historic sites and archaeological resources for their aesthetic, scientific, educational, and cultural values.
- 8.5-I 1 – Working in conjunction with the California Archaeological Inventory (CAI), review each proposed development project to determine whether the site contains known prehistoric or historic cultural resources and/or determine their potential for as-yet-undiscovered cultural resources.
- 8.5-I 2 – Require that areas found to contain significant historic or prehistoric artifacts be examined by a qualified consulting archaeologist or historian for appropriate protection and preservation, if feasible.
- 8.5-I 5 – Encourage property owners to rehabilitate historic buildings, consistent with regulations which allow such properties, with densities that exceed General Plan standards or are residential uses in a commercial district to be legally conforming.

Methodology

Information Center Records Search

A records search of previous cultural resource surveys and recorded resources in the Project vicinity was conducted by the Northwest Information Center of the California Historical Resources Information System (Appendix D). The literature cited in the search includes:

- Historic Properties Directory (Includes National Register, State Registered Landmarks, and Historic Points of Interest) – Listing by City (2003).
- Historic Spots in California (Hoover, et al, 1966 and 1990)
- Ethnogeography of the Plains Miwok (Gudde 1969)
- Handbook of the Indians of California (Kroeber 1925)
- The Patwin and Their Neighbors (Kroeber 1932)
- Discover Historic California (Roberts 1988)
- California Architecture: Historic American Buildings Survey (Woodbridge 1988)
- The WPA Guide to California (Works Progress Administration 1984)

Thresholds of Significance

Impacts would be considered significant if the Project would:

- Cause a substantial adverse change in the significance of an historical or unique archeological resource, pursuant to §15064.5 of the State CEQA Guidelines;

- Directly or indirectly destroy a unique paleontological resource or geologic feature; or disturb any human remains, including those interred outside of formal cemeteries; or,

- Disturb any human remains, including those interred outside of formal cemeteries.

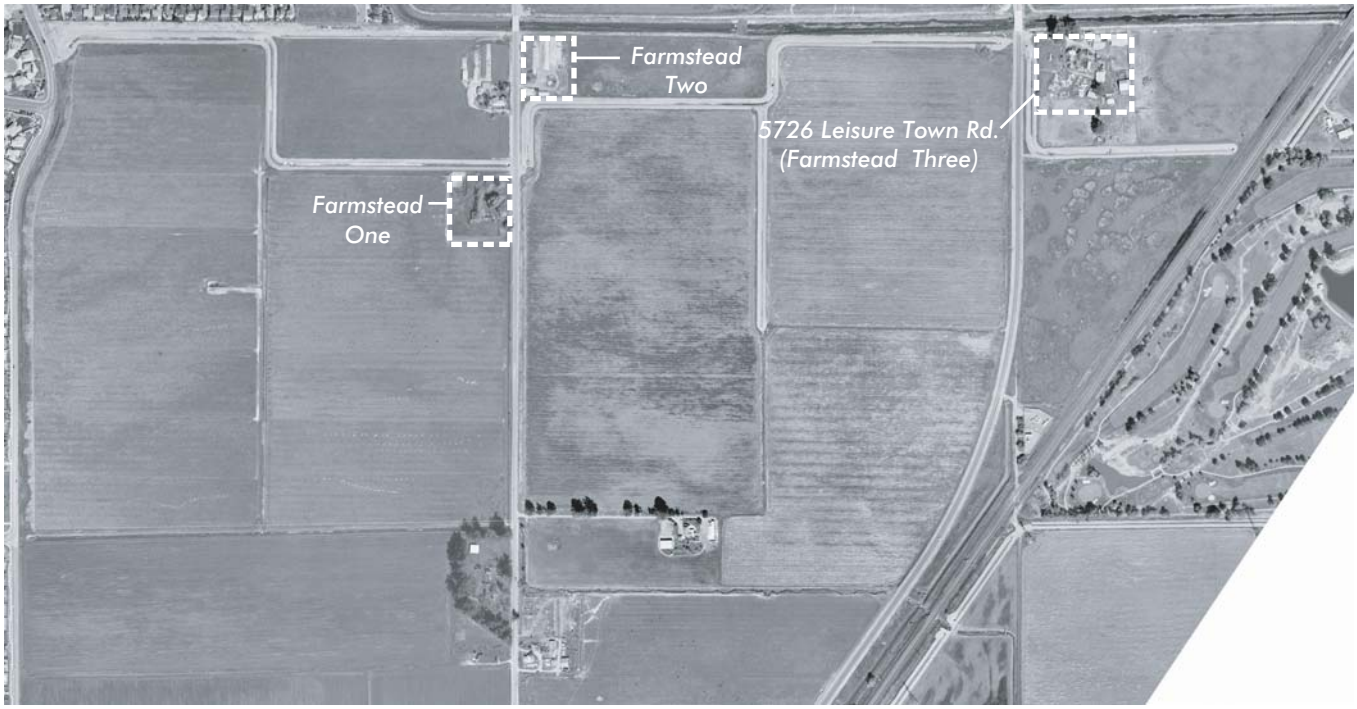
Environmental Impact and Mitigation Measures

Impact CR-1 Cause Adverse Change to Historic Resources

The Project area includes a recorded section of road, formerly known as the Road to Suisun City. The Historic Properties Directory lists two properties within the Project area. One of the listed properties is off-site and the other property is located within the Moody portion of the Project site. Neither of these properties was eligible for listing to the National Register of Historic Places. There are three existing residences within the project site that were historically used as farmsteads, two of which have been on-site since at least 1940 (see Figure 3.5-1).

Farmstead One

The former farmstead centrally located within the Southtown property, on the west side of Vanden Road, can be seen on-site in an aerial photograph dated 1937. A visit to the property revealed that it has been abandoned for at least the past two decades. The farmstead currently consists of a single-family residence, storage shed, corral, and outbuildings. All buildings are vacant and in poor condition, with much deterioration of the wood framing, roof, and paint. There are also several pieces of rusted farm equipment present. Given the modified state of Farmstead One, it does not retain sufficient historical integrity to be considered a valuable historic resource. These properties do not meet the criteria required for listing. Impacts resulting from Project implementation to Farmstead One is considered **less than significant.**



Source: *Cotton/Bridges/Associates, 2003.*

Figure 3.5-1
On-Site Structures

Farmstead Two

Another former farmstead is visible in the 1937 aerial photograph, located within the Southtown property, east of Vanden Road. The property has been substantially modified since that time and is now occupied by a single-family, manufactured home, three elongated sheds, and several other outbuildings. The sheds have been divided into various units by interior partitions and appeared to be used as a self-storage facility.

Pursuant to the provisions of CEQA, impacts to historical resources are considered significant if the resource is eligible for listing to the California Register of Historic Resources. A resource is eligible for listing only if it meets certain criteria. Criteria used to determine listing is related to historic events, important people from history, distinctive characteristics of construction, and important historic information. Integrity of a property also plays an important role in determination of eligibility for listing. Integrity relates to the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Properties must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to retention of location, design, setting, materials, workmanship, feeling, and association.

Given the deterioration of Farmstead two, this property does not retain sufficient historical integrity to be considered a valuable historic resource. This property does not meet the criteria required for listing. Impacts resulting from Project implementation to Farmstead Two are considered **less than significant.**

5726 Leisure Town Road (Farmstead Three)

A Historic and Cultural Resources Report prepared as part of the EIR determined that the residence located within the Moody portion of the Project site was probably constructed between 1875 and 1878 (See Appendix D). The residence is an uncommon steep-pitch cross-gable Italianate farmhouse. The two-story structure retains most of its character-defining features including the beveled wood siding, wide flat trim boards, wide boxed eaves (without brackets) and bracketed hoods over four-over-four wood sash windows. The windows are approximately three feet by five feet on the first floor and three feet by five feet on the second floor. The entry door with transom window and upper gable end window are framed to create a single centered element. The original entry porch has been removed but the brackets and chamfered porch supports do exist.

Overall the plan, height and scale of the residence are closer to that of the classical revival style. The symmetrical form, essentially using three equally sized boxes joined at the center, is unusual for a rural Italianate structure. The Italianate style of the wood detailing would have been seen in pattern books of the period and applied by a carpenter, not designed by an architect.

The center entry porch/door/transom/upper window composition is a more elaborate treatment than was typical of the time and would have made a strong architectural statement. The placement of the feature on the north elevation also indicates that the use of this combination was designed to manage summer heat. The porch was probably about 24 inches deep with two single support posts echoing the remaining chamfered porch supports. A rail ran the perimeter of the porch roof allowing use as a small balcony. The remaining chamfered support posts at the second floor level

indicate the rail height. Prototypes of this type of assemblage are found in the mid-western, eastern and southern regions where extreme heat was controlled by similar techniques.

There is a later (probably 1930's) single-story addition to the rear that is severely compromised by damage. The existing tin roof of the residence replaced the original wood shake roof but the materials, form, scale and massing of the original structure remains as built. All of the original barns, sheds and other structures have been either demolished, or are significantly deteriorated or altered.

The setting remains the same, as the structure is surrounded by agricultural land, mature trees, plantings and lawn and retains the characteristics of a nineteenth century farmhouse property. It is an unusual example of an Italianate farmhouse and of a remaining farmhouse that once dotted the Vacaville and Elmira region.

Field Survey and Analysis

A field survey of the residence at 5726 Leisure Town Road (APN 0136-120-030 and APN 0136-120-020) was conducted on August 1, 2003. Photographs were taken of the property for the consultant's reference.

The goal of this survey was to analyze, review and update the level of historic integrity for use in the evaluation of the structure. Materials used to evaluate the property include *California Register and National Register: A Comparison for purposes of determining eligibility for the California Register* (SHPO, May 2001 Technical Series #6) and *How to Apply the National Register Criteria for Evaluation*, National Register Bulletin, #15 (NPS, October 1991). A previous Inventory/Evaluation Form created for the California Department of Transportation (Caltrans) in 1996 was also consulted.

Methods used to evaluate the integrity of the property included information gathered from books and materials as listed in the Bibliography and analysis outlined in *How to Apply the National Register Criteria for Evaluation*, National Register Bulletin, #15, (NPS, October 1991). The residence at 5726 Leisure Town Road was analyzed for eligibility for inclusion on the California Register of Historical Resources

The area of significance for the residence at 5726 Leisure Town Road is Agriculture, for agricultural development in Solano County. It is an excellent example of a remaining Solano County farmhouse in the Italianate style of architecture.

The original barns and other auxiliary structures are not intact. The porch entry is missing and there is some minor damage due to lack of maintenance, however the residence retains a high level of integrity as a Solano County farmhouse.

Findings

The 1996 Inventory/Evaluation Form created by Caltrans evaluated the property for the National Register of Historic Places. The residence was not evaluated for the California Register at that time. The residence was evaluated for the California Register in August 2003 and is recorded on DPR *Primary*, and *Building, Structure and Object* records.

The finding of the Historic and Cultural review is that the residence at 5726 Leisure Town Road meets the standard of Criterion 3 of the California Register (at the local level), as it embodies the distinctive characteristics of a late nineteenth century Italianate farmhouse in Solano County.

Although only the State Office of Historic Preservation can make the official final determination of eligibility for the California Register of Historical Resources, information provided within this section of the EIR finds that the residence located at 5726 Leisure Town Road is potentially eligible for listing on the California Register. Additional research and documentation would likely be required to complete the actual California Register nomination. Impacts to this structure are considered **potentially significant** and mitigation is required.

Mitigation Measure CR-1

Prior to the start of construction within the Moody portion of the Project site, the Project proponent shall consult an architectural historian to conduct an analysis of the structure located at 5726 Leisure Town Road. The analysis will include the following:

- **Site visit, measure and photography**
- **Condition assessment**
- **Research related to required and voluntary building code upgrades**
- **Recommendation of upgrades based on the State Historic Building Code and Secretary of the Interior Standards**
- **Assessment of the plans for housing project as related to the Secretary of the Interior Standards and Guidelines for Rehabilitation based on rehabilitation of character defining features.**
- **Evaluation for four impact scenarios including demolition, rehabilitation in place, relocation and rehabilitation, and mothballing for future rehabilitation**
- **Preparation of construction cost budgets**
- **Research of potential funding resources**
- **Following implementation of the mitigation measure identified above, the Project proponent will proceed with the recommended action, unless preservation is determined by the City to be inconsistent with achieving the Project goals as outlined in the General Plan.**

At this time, it is anticipated that the cost for relocation and rehabilitation far exceeds the Project's burden of mitigating the anticipated impact. Unless alternative sources of funding are made available for this effort, relocation and rehabilitation will not be pursued. For the purposes of this EIR, it is assumed that the structure within the Moody portion of the Project site will be demolished and the impact will be **significant and unavoidable**.

Impact CR-2 Cause Adverse Change to Archaeological Resources within the Project Site

The records survey performed for the Project determined that there is a low to moderate potential for Native American sites and a high potential for historic-period archaeological deposits in the Project area. The Records Survey found no recorded Native American archaeological resources

within the project area. However, the Southtown site has been disturbed by agricultural activities for several decades. Nearly the entire site is developed with agricultural land uses with the exception of three small residences and accessory structures. The Project site is not located within the City's Historic Preservation District and there are no identified historic structures on-site. There are no known archaeological resources within the site.

Given the presence of the Patwin Native American group and the early settlement of the area during the 1800s, the cultural resources inventory determined that there is a potential for construction activities to unearth previously undiscovered cultural resources. This impact is **potentially significant**.

The Project will be subject to the following mitigation measure.

Mitigation Measure CR-2

Should prehistoric and/or historic resources be uncovered during construction activities, construction activities will cease and a qualified archaeologist shall be consulted for on-site evaluation of the resource. Prehistoric resources include but are not limited to chert or obsidian flakes, projectile points, mortars and pestles, and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. Historic resources include but are not limited to stone or adobe foundations or walls, structures and remains with square nails, and refuse deposits or bottle dumps. If the bone appears to be human, State law requires that the Solano County Coroner be contacted. If the coroner determines that the bone is human and is most likely Native American in origin, the Native American Heritage Commission shall be contacted. All measures established by the Commission shall be followed to ensure that adverse impacts are avoided.

Incorporation of the mitigation measure described above will reduce the Project's impacts on cultural resources to **less than significant**.

3.6 Geology, Soils, and Mineral Resources

This section describes potential impacts due to geologic conditions, seismic activity, and soil conditions. This section is based on review of available literature and maps, including geologic hazard maps created by the California Geologic Survey, the Vacaville General Plan and General Plan EIR, and the Phase I Environmental Site Assessment (ESA) conducted as part of this environmental review. The Phase 1 ESA is available as Appendix J.

Environmental Setting

Vacaville is located at the edge of two geographic provinces: the Sacramento portion of the Central Valley province and the Coast Ranges.[1] Geologic conditions in this area are the result of activity occurring during the Mesozoic and Cenozoic eras. These two eras span nearly 200 million years and include alternating periods of mountain building, volcanic activity, erosion, and deposition that created the present day landforms. The Mesozoic rock found in the area includes marine Cretaceous sandstone and shale, and variably metamorphosed clastic and volcanic rocks of the Franciscan assemblage which forms the core of the range. The Cenozoic rocks consist of clastic strata of continental and marine origin, as well as large areas of Pliocene-Pleistocene volcanic rocks.

The physiography of the region is varied. Generally from west to east, landforms common to the Vacaville area are the low hills and dissected uplands, low alluvial plains and fans, and flooded basins. Low hills and dissected uplands are evident in the north from Vacaville to Putah Creek. The eastern two-thirds of the county is comprised mostly of low alluvial plains and fans ranging in elevation from about 100 feet at the edge of the Coast Ranges foothills to near sea level at the eastern border. This area is the location of the principal groundwater basin.

Although no active faults are located within several miles of the Project site, there are several major faults in the region, including the San Andreas, West Napa, Rodgers Creek, Dunnigan, Midland/Kirby Hills, Hayward, Calaveras, and Green Valley/Concord faults. Major faults in the area are located within the San Francisco Bay area to the west and the Central Valley region to the east. The California Geologic Survey (formerly known as the California State Division of Mines and Geology) has mapped all areas of the state with regard to the risk posed by seismic hazards. The Project site has a moderate susceptibility to liquefaction and no risk of landslide.[2]

Effects of groundshaking resulting from seismic activity are measured in two ways. The Modified Mercalli Scale is the standard measurement for the intensity of an earthquake, and subjectively measures the amount of damage suffered at ground level. The Richter Scale is used to measure the intensity of an earthquake. This scale uses an objective quantification to measure the force generated by the earthquake.

Regulatory Setting

Regulations and standards related to geology, soils, and seismicity are included in State regulations, City ordinances, and general and specific plans adopted to protect public safety and to conserve open space. The following is a brief summary of the regulatory context under which soils and geologic hazards are managed at the federal, State, and local level. Agencies with responsibility for protecting people and property from damage associated with soil conditions and geologic hazards in the project area are described below.

Federal and State

The State of California provides minimum standards for structural design and site development through the California Building Standards Code (California Code of Regulations (CCR), Title 24). The California Building Code (CBC) is based on the Uniform Building Code (UBC), used widely throughout the U.S. (generally adopted on a state-by-state or district-by-district basis), and has been modified for California conditions with numerous more detailed and/or more stringent regulations.

Where no other building codes apply, Chapter 18 of the UBC/CBC regulates excavation, foundations, and retaining walls, and Appendix Chapter A33 regulates grading activities, including drainage and erosion control, and construction on expansive soils. The State earthquake protection law (California Health and Safety Code 19100 *et seq.*) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum seismic safety requirements are set forth in Chapter 16 of the UBC/CBC. The UBC/CBC identifies seismic factors that must be considered in structural design.

Installation of underground utility lines must comply with industry standards specific to the type of utility (e.g., National Clay Pipe Institute for sewers and American Water Works Association for water lines). These standards contain specifications for installation and design to reflect site-specific geologic and soils conditions.

Other State regulations pertaining to the management of erosion/sedimentation as they relate to water quality are described in Section 3.9, Surface Hydrology and Water Quality. Such regulations include, but are not limited to, the National Pollutant Discharge Elimination System (NPDES) program for management of construction and municipal stormwater runoff, which is implemented at the State and local level through issuance of permits and preparation of site-specific plans. Sections 1600 to 1607 of the California Department of Fish and Game Code regulate activities that would alter stream characteristics, including erosion. While the primary purpose of these regulations and standards is the protection of surface water resources from the effects of land development, measures included within such regulations and standards also help to minimize the potential for slope instability due to soil loss.

Local

The Safety Element of the Vacaville General Plan sets forth requirements for minimizing geologic impacts for new development, with the goal of "protection of the community from unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground

failure, and dam failure; slope instability leading to landslides, subsidence and other geological hazards; flooding' wildland and urban fire; and hazardous material accidents." The policies of that Element, as applicable to geologic, soil, and mineral resources, are provided below.

Policy 9.1-G 1
Investigate and mitigate geologic and seismic hazards or locate development away from such hazards in order to preserve life and protect property.

Policy 9.1-G 3
Give primary consideration to geologic conditions in the selection of land use and in the design of development in Vacaville. Retain high-risk areas in low-occupancy or open forms of use where potential risks are unmitigable

Policy 9.1-I 3
Require geotechnical studies prior to approval of rezoning, specific plans, or subdivision maps in areas of low damage susceptibility designated 2 through 4 and areas of high damage susceptibility as shown on the Relative Susceptibility to Landsliding Map within a quarter-mile of a known fault. Require comprehensive geologic and engineering studies of critical structures regardless of location.

Policy 9.1-I 4
To the extent practical, do not allow critical facilities, structures involving high occupancies, and public facilities to be sited in areas of high damage susceptibility. Where such location is deemed essential to the public welfare, these structures will be sited, designed, and constructed with due consideration of the potential for earthquake damage due to ground shaking, associated ground deformation, seismically triggered flooding, liquefaction, and landslide.

Policy 9.1-I 9
Require preparation of a soils report prior to issuing a building permit, except where the Building Official determines that a report is not needed.

Methodology

Information to establish geological baseline conditions was compiled from published information, site visits by staff of the EIR preparer (Cotton/Bridges/Associates), and consultation with City staff. Technical reports and information published by the California Geologic Survey, Vacaville General Plan EIR, and other relevant environmental documents were used to describe existing conditions. The analysis of geologic and soils impacts is qualitative, and evaluates the extent to which development activities could affect or be affected by known geologic and soils conditions. The significance of impacts is based on the Thresholds of Significance presented in the following section.

The information obtained from these sources was reviewed and summarized to establish existing conditions and to identify potential environmental effects. In addition to reviewing available reports, a site reconnaissance of the proposed Project area was conducted to visually confirm landforms, slopes, and general geologic conditions. In determining the level of significance, the analysis assumes that the proposed Project would comply with relevant federal, State, and local ordinances and regulations, as well as policies set forth in the Vacaville General Plan.

Thresholds of Significance

Impacts would be considered significant if the Project would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic ground shaking, seismic-related ground failure, landslide, expansive soils, or other geologic or soil-related hazard;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
- Be located on an expansive soil, as defined in the Uniform Building Code, creating substantial risk to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;
- Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state; or
- Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

Environmental Impact and Mitigation Measures

Impact GEO-1: Potential for Major Geologic Hazard

Major geologic hazards include seismic ground shaking, seismic-related ground failure, landslides, expansive soils, or other geologic or soil-related hazard. The potential for seismic ground shaking and seismic-related ground failure are both accounted for on the Alquist-Priolo zone maps, which show the likelihood that a particular area will be affected by seismic activity, given its proximity to known faults and historical seismic activity.

The entire Vacaville area, including the Project site, rates as a high intensity earthquake zone. Major ruptures on known faults in the area have the potential to produce moderate to high intensity groundshaking at the site. Potential damage resulting from earthquakes is measured in two ways. The magnitude of an earthquake is measured by the Richter Scale, showing the amount of energy released and amplitude of waves produced by an earthquake. The scale is logarithmic so that a recording of 7, for example, indicates a disturbance with ground motion 10 times as large as a recording of 6. A quake of magnitude 2 is the smallest quake normally felt by people. Earthquakes with a Richter value of 6 or more are commonly considered major; great earthquakes have magnitude of 8 or more on the Richter scale. The Mercalli Scale measures the intensity of an earthquake, based on potential damage and the perception and reaction of the quake by people. The Mercalli scale assigns ratings from I (unnoticeable to most people) to XII (total destruction).

Previous environmental studies[3] have assessed potential for impact of this area based on available data for earthquakes along major faults within 50 miles of the city. The following table presents the maximum potential impact associated with earthquakes, according to both magnitude (Richter Scale) and Intensity (Mercalli Scale).

Table 3.6-1
Maximum Potential Earthquake Impact

Fault	Type	Distance from City	Maximum Earthquake Magnitude (Richter)	Maximum Earthquake Intensity (Mercalli)
Dunnigan Hills	Subsurface Normal	20 miles	6.25	VII-VIII
Midland	Subsurface Normal	5 miles	7.03	IX-X
SAN ANDREAS FAULT SYSTEM				
Antioch	Strike-Slip Right Lateral	50 miles	7.00	IX-X
Greenville	Strike-Slip Right Lateral	50 miles	6.50	VII-VIII
Concord	Strike-Slip Right Lateral	18 miles	6.90	VII-VIII
Green Valley	Strike-Slip Right Lateral	15 miles	6.90	VII-VIII
Healdsburg	Strike-Slip Right Lateral	30 miles	7.25	IX-X
Hayward	Strike-Slip Right Lateral	40 miles	7.25	IX-X
Calaveras	Strike-Slip Right Lateral	48 miles	7.25	IX-X
San Andreas	Strike-Slip Right Lateral	50 miles	8.30	XI-XII

Although both the Project site and the city as a whole are designated as high-risk areas for earthquake damage, potential damage can be minimized through construction requirements. Provisions of the Uniform Building Code and California Code of Regulations contain requirements for construction of new structures to withstand potentially occurring earthquakes in the area, and compliance with these standards and regulations will reduce potential impacts associated with the Project to a level of **less than significant**.

Impact GEO-2: Potential for Liquefaction

The potential for impacts from liquefaction of the soil are based on the specific soil types and locations on the site. The Vacaville General Plan shows liquefaction potential as moderate. USGS maps indicate that soils on site are alluvial basin and delta soils, which are typically found on basin rims, alluvial fans, and deltas, and in basins, dredge spoil areas, and salt water marshes. Prior to issuance of a building permit for any structure, the Project applicant is required (General Plan Policy 9.1-I-9) to submit a detailed soils study to the building department. This report is required to identify areas that are subject to moderate to high risk of liquefaction. From this report, specific foundation types and grading methods can be required to reduce likely impacts. The following mitigation measure will ensure that liquefaction impacts are reduced to a **less-than-significant** level.

Mitigation Measure GEO-2

Prior to issuance of building permits, the Project applicant shall contract with a certified geologic engineer to perform a soils analysis of the Project site, consistent with requirements of the City of Vacaville. Grading and building designs, including foundation requirements, shall be consistent with the findings of the soils report, the California Code of Regulations, and the Uniform Building Code. The Building Department shall require that foundation design and grading requirements of individual lots and buildings are sufficient to reduce potential liquefaction of soils to a low level.

Impact GEO-3: Potential for Erosion or Loss of Topsoil

The potential for loss of topsoil through erosion is a potentially significant impact. The initial Project designs indicate the entire 297-acre site will likely require grading, and 150,000 to 400,000 cubic yards of soil will need to be imported to the site for leveling of the site, raising of building pads, and other uses. The impacts related to potential loss of topsoil include the impact to the soils on-site and impacts associated with dispersed topsoil contaminating waterways. The Dally Canal, a Solano County Irrigation District facility, runs east to west, along the northern boundary and through the Project property. The newly realigned Alamo Creek is located immediately north of the site. Each of these waterways could potentially be affected by erosion from the Project site.

The Project site is relatively flat, with little topographical change. Preliminary soils information from USGS maps, along with the flat topography, indicate that the soil conditions are not generally subject to excessive soil erosion. However, it is anticipated that surficial grading activities will be required for all portions of the Project site in order to attain grades called for in development plans. The scale and phasing of the development also indicates that construction will occur over multiple seasons, thus creating additional possibilities for runoff and erosion during rainy seasons. For these reasons, erosion control procedures will be required to reduce potential impacts related to soil erosion to a less than significant level.

Wind erosion is also a potentially-occurring impact during construction. Movement by wind of lighter, fine-textured soils away from the site can occur during construction and grading operations. Mitigation measures in the Air Quality section of this report require watering of the Project site during construction and grading seasons to minimize the amount of airborne dust generated by these activities. In addition, the Project will be required to obtain a National Pollution Discharge Elimination System (NPDES) permit to ensure that potential pollutants generated by construction are mitigated. This impact is **potentially significant** without mitigation, as described below.

Mitigation Measure GEO-3a

The Project proponent will prepare an erosion control plan, to be approved by the Vacaville Community Development Department. The Plan will identify, as applicable, the Best Management Practices (BMPs) that will be employed during construction to ensure that all soil erosion and deposition is contained within the construction site. Such BMPs may include, but are not limited to, construction of sediment barriers, installation of energy dissipaters, protection of floodways, covering the graded area or piled soil with straw or straw matting, and using water for dust control. The erosion control plan shall be consistent with the City's Storm Water Pollution Prevention Plan (SWPPP), requirements of the Regional Water Quality Control Board,

and all applicable City standards.

Mitigation Measure GEO-3b

Areas disturbed by grading or construction will not be left exposed over the winter season. During construction, prompt development, Best Management Practices of in-place erosion control measures, or replanting of native, drought tolerant vegetation will be practiced at all times. Any disturbed areas which are not developed at the end of construction will be planted, mulched, or protected for the duration of the winter by methods deemed acceptable by the City of Vacaville.

Implementation of Mitigation Measures GEO-3a and GEO-3b will reduce erosion impacts to a level of **less than significant**.

Notes and References

[1] Information for this Environmental Setting section is taken primarily from the Vacaville General Plan Draft Environmental Impact Report, 1999.
[2] City of Vacaville. *General Plan*. 1990.
[3] Lagoon Valley EIR, August 1990, Alamo Place Subdivision FEIR, 1994

3.7 Land Use, Planning, Population, and Housing

This section describes impacts of the Project on land use planning, and especially inconsistencies of the Project with adopted City planning goals, objectives, and policies intended to reduce environmental impacts of development projects.

Environmental Setting

Over the past several decades, Vacaville has grown from a small, rural town into a moderate-sized city. Vacaville has a diverse range of land uses and potential for future development. Growth rates can also be attributed to the city's location within commuting distance to the San Francisco Bay Area. The Bay Area has influenced growth in eastern Solano County due to the comparatively affordable housing costs and the decentralization of employers from the Bay Area to other regions. In addition, the overall cost of developable land is cheaper outside of the Bay Area. Vacaville's growth is expected to continue as a result of the remaining potential for additional industrial and commercial development, which in turn result in additional jobs and increased demand for housing.

Vacaville's population is estimated to be 93,927 persons according to the most recent California Department of Finance figures. The city population increased by 5,300 (6 percent) between January 2000 and January 2003. A unique influence on Vacaville's population is the presence of the California Medical Facility and the California State Prison, both State Department of Corrections facilities, within the city limits. Approximately 10 percent of Vacaville's total population is attributable to the 9,000 inmates incarcerated within these two facilities.

Vacaville's current General Plan, amended in 1999, anticipates a total population between 108,000 and 124,000 at residential buildout of the city in 2015. As of 2001, the City maintained a housing stock of approximately 29,992 housing units, mainly consisting of detached, single-family homes. Development within the city will be focused to improve the jobs to housing ratio, which means providing local jobs and increasing the number of higher paying jobs available within the city, in direct proportion with residential growth.

According to the Association of Bay Area Governments (ABAG), Vacaville's population will increase by 2.8 percent per year between 2002 and 2005, and then slow to 1.9 percent annually between 2005 and 2010, and 1.6 percent annually between 2010 and 2015. ABAG projects the number of Vacaville households will grow faster than the population, averaging approximately two percent per year through 2015. This implies that the average number of persons per household will decrease over the next 12 years.

ABAG projects that Vacaville will grow by approximately 700 households per year from 2003 to 2005, 690 units per year from 2006 and 2010, and 670 units per year from 2011 to 2015. The

largest share of the projected household growth will occur within single-family dwelling units. The household growth projections translate directly to increased housing demand within Vacaville.

The Housing Element of the General Plan indicates that Vacaville's share of the regional housing need, as established by the State Department of Housing and Community Development and ABAG, is 4,636 housing units. To date, there is a remaining need of 2,476 housing units to be provided by 2006. Current development plans in the city undergoing review and approval would provide approximately 6,716 new housing units in Vacaville, not including the Southtown Project.

The Land Use Element of the General Plan specifies a citywide housing mix as a planning guideline: approximately 60 percent single-family; 20 percent moderate density (duplexes, triplexes, townhouses, mobile homes, etc.) and 20 percent garden apartments. This policy has been in place since the 1980s, resulting from a surge in multi-family construction. Historically, the City also had a policy to monitor the citywide housing mix however, in 2001, the City Council amended the General Plan to remove the requirement for annual monitoring.

The Project site is located southeast of the developed portion of Vacaville, outside of the existing City limits but within the Sphere of Influence (SOI). The current General Plan identifies a large portion of the site as being located within the Vanden Specific Plan, which is no longer applicable as the Specific Plan was abandoned by the developers and not fully processed by the City. The General Plan identifies land use designations for the site, which are still applicable. General Plan Amendments and rezoning proposed as part of the Project would make the proposed Project consistent with the General Plan and zoning, and would create specific development policies to guide Project development.

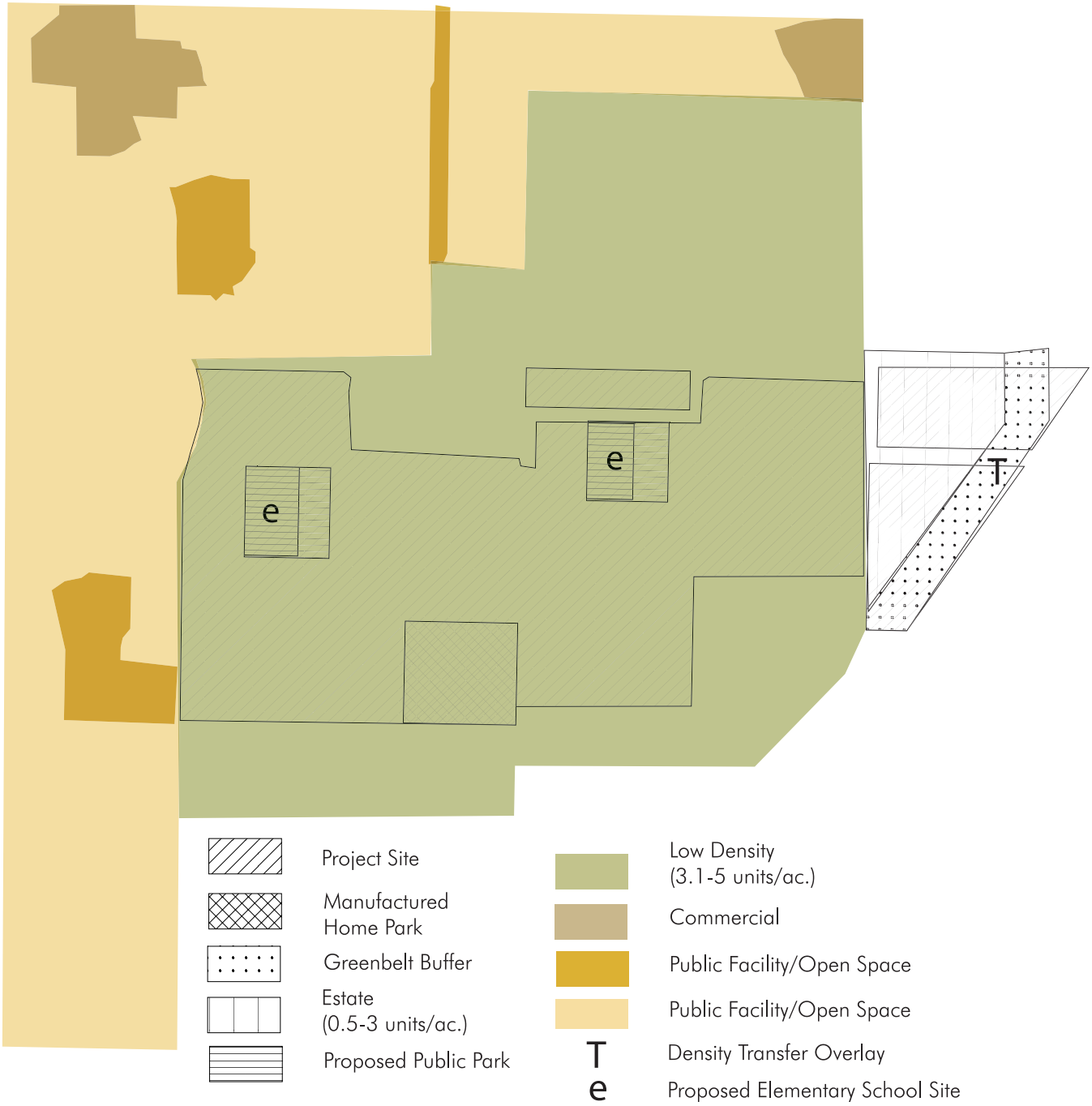
As shown in Figure 3.7-1, the existing land use designations within the Project site include: estate (0.5-3 dwelling units per acre), low-density residential (3.1-5 dwelling units per acre), two elementary school sites, two public park sites, a small manufactured home park, and an area of greenbelt buffer within an overlying density transfer zone.

Regulatory Setting

Relevant information regarding plans, regulations, and entities that guide land use in Vacaville and Solano County are discussed below.

General Plan

Vacaville's General Plan was adopted in 1990 and amended in 1999. This State-mandated document is required to contain seven elements including: Land Use, Circulation, Housing, Open Space, Safety, Conservation, and Noise. The General Plan also includes a Parks and Recreation Element and a Public Facilities, Institutions, and Utilities Element. Elements contain goals, policies, and programs, which are representative of the direction of growth desired by the community and provide guidance to development through the creation of a framework with which all development must be consistent. Policies in the General Plan are implemented through actions taken by the City's Planning Commission and City Council and other decision making bodies. The General Plan requires that all development be consistent with the General Plan and be subject to site development and design review.



Source: *Vacaville General Plan, 1990 and 1999; adapted by Cotton/Bridges/Associates, 2003.*

Figure 3.7-1
General Plan Land Use Designations

Solano Local Agency Formation Commission

The Solano Local Agency Formation Commission (LAFCO) is the State-mandated commission responsible for coordinating logical and timely changes in local government boundaries. LAFCO's powers, procedures, and functions are set forth in the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000. The Solano LAFCO has jurisdiction of boundaries for the cities of Benicia, Dixon, Fairfield, Rio Vista, Suisun, Vacaville, and Vallejo, as well as Solano County itself.

All annexations are approved by the Solano County LAFCO. Annexation procedures include a review of the proposed boundary change in light of 11 standards established by Solano County LAFCO's adopted *Standards and Procedures*. An annexation is required to fully comply with six mandatory standards, which mainly address general plan consistency, environmental impacts, and sphere of influence issues. The remaining five standards are discretionary and address issues related to the establishment of logical boundaries, growth inducement, and prime agricultural farmland, as well as social and economic impacts.

Comprehensive Annexation Plan

Pursuant to the Standards and Procedures adopted by the Solano LAFCO, the City of Vacaville has adopted a Comprehensive Annexation Plan (CAP). The CAP is intended to consolidate and summarize development policies of the City and provide an overview of growth within Vacaville over a 10- to 15-year planning period. Required elements within a CAP include: an urban growth strategy, an infill strategy, and an agricultural preserve strategy. The most recently adopted CAP for Vacaville covers the planning period between 2001 and 2015.

Land Use and Development Code

The Land Use and Development Code sets forth the rules and regulations that govern land use and development throughout the city. The Code consists of several divisions that include the procedures related to environmental review, general plan amendments, subdivision standards, grading standards, traffic and school mitigation, floodplain management, and construction and fire standards. The Code also contains the City's Zoning Ordinance, which includes detailed information regarding allowable land uses within each zoning district.

Planned Growth Ordinance

Vacaville's Planned Growth Ordinance (PGO) was adopted in 1991 and revised in 2000. The PGO was established to ensure that all new residential development within the city has adequate infrastructure for water treatment and supply, wastewater collection and treatment, and stormwater drainage, to serve new units and residents. The amendment to the PGO in 2000 included a requirement that a base inventory of up to 1,000 units within approved and unbuilt projects be maintained on an annual basis. Units that have building permit allocations and/or are eligible to be issued permits at any time make up the 1,000-unit inventory. The allocation process, established by the PGO, provides a mechanism to maintain the 1,000 unbuilt unit base inventory. As the inventory falls below 1,000 unbuilt units, new projects are added through the recording of a final map or through City Council approval of allocations following the approval of a planned

development. The City Council retains the flexibility to grant allocations over the 1,000 unbuilt units.

Methodology

Land use planning impacts are evaluated in this section by determining if the proposed Project is in compliance with goals, policies, and land use designations of the City of Vacaville General Plan, Land Use and Development Code, and other relevant policy documents. The analysis focuses specifically on policies that, if violated, may contribute to some direct or reasonably foreseeable indirect environmental impact (as defined by the CEQA Statutes and Guidelines). While this EIR analyzes consistency with environmental policies, it is the Planning Commission and City Council who will make the ultimate determination regarding land use compliance. The Solano LAFCO will also review the Project and make findings related to land use planning and policy impacts prior to approval or disapproval of annexation of the Project site into the city limits.

This section also analyzes the compatibility of the Project with surrounding and nearby land uses and properties. Incompatible land uses can create significant environmental impacts for both the proposed use and the existing use. Potential land use compatibility issues include those related to noise levels, unsafe traffic conditions, adverse changes to the aesthetic environment, odors, and air quality degradation. Compatibility issues have been analyzed and are identified within this section and in the respective sections of this EIR. Issues related specifically to development of the Southtown Project are discussed in more detail in:

- Section 3.3, Air Quality
- Section 3.8, Noise
- Section 3.13, Transportation
- Section 3.2, Agricultural Resources
- Section 3.4, Biological Resources
- Section 3.11, Safety and Health

This section also analyzes the population growth and housing impacts of the Project – relying on an understanding of basic urban land economics to determine the potential for the Project to induce growth. Refer to Appendix I for more information about the fiscal impacts and infrastructure needs of the Project.

Thresholds of Significance

Impacts would be considered significant if the Project would:

- Physically divide an established community;

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;

- Conflict with any applicable habitat conservation plan or natural community conservation plan;

- Induce substantial population growth in an area, either directly or indirectly;
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Environmental Impact and Mitigation Measures

Impact LAN-1: Consistency with the Vacaville General Plan, Land Use and Development Code, and Comprehensive Annexation Plan

At this time, the Southtown Project is being processed pursuant to the provisions of a "planned development" identified in Vacaville's Zoning regulations. Planned developments are similar to specific plans or master plans, which allow for the flexible application of zoning regulations to promote innovative site layouts and design. The current General Plan requires that areas being annexed into the City be subject to a specific plan or policy plan.

Residential land use designations being proposed within the Southtown Project include:

- ***Residential Low Density and Low/Medium Density –*** Detached single-family homes; Proposed Density = 4.5 dwelling units per acre
- ***Residential Medium Density –*** Cottage-style single-family homes, townhouses, duplexes; Proposed Density = 10 dwelling units per acre
- ***Residential High Density –*** multi-family apartment complexes; Proposed Density = 22 dwelling units per acre

Other land use designations included within the Southtown Project include:

- ***Commercial –*** Approximately 30,000 square feet of retail/service commercial, RV and Mini-storage
- ***Public/Institutional –*** Approximately 14 acres of Community/Town Center, fire station; General Plan Base Density = up to 0.3 floor area to site area ratio (FAR)
- ***Public Parks –*** Approximately 33.5 acres of public parks.

Residential development standards require a housing mix of approximately 60 percent traditional single-family residential dwelling units, 20 percent zero lot line, single-family residential dwelling units such as duplexes, triplexes, and townhomes, and 20 percent multiple family residential dwelling units such as garden apartments and condominiums. As designed, the Southtown Project will provide a housing mix of 55 percent traditional single-family dwelling units, 29 percent zero lot line clustered single-family units and townhomes, and 16 percent multiple family apartments. The Project is considered to be consistent with the approximate required residential mix.

Development of the Southtown Project will be subject to a phasing plan being prepared in conjunction with the development plans of the Project. Construction is anticipated between 2006 and 2011. A large portion of construction will occur within the first year associated with the development of 500 dwelling units as well as the majority of the required infrastructure. Over the next six years, the remaining dwelling units and infrastructure improvements will occur at a reduced rate with the construction of approximately 200 dwelling units or less per year and related infrastructure.

Regulatory authorities under which the provisions of the Vacaville General Plan, Land Use and Development Code, and Comprehensive Annexation Plan have been established are discussed earlier in this document. The focus of the following discussion relates to the Project's consistency with the specific and applicable policies, plans, and programs contained within these plans.

Vacaville General Plan

Table 3.7-1 identifies General Plan land use policies with some relationship to environmental issues that relate to the proposed Project. For each identified policy, the table provides a summarized explanation as to whether or not the Project is consistent with the policy.

Table 3.7-1
Consistency with Relevant General Plan Land Use Policies

Goal, Policy, or Objective	Is the Project Consistent?	Explanation
LAND USE ELEMENT		
Guiding Policy 2.1-G 4 Minimize conflicts between agricultural and urban uses and provide for a transitional area or buffer between agricultural and urban uses.	No	The Project will be located immediately north of an area that will remain in agricultural land uses, but no buffers are proposed. Refer to Section 3.2, Agricultural Resources, for more detail.
Guiding Policy 2.1-G 5 Design aesthetically pleasing roadways, including loop street system lined with trees or other appropriate landscaping that connect Vacaville neighborhoods and serve planned development.	Yes	The Southtown Project will provide its residents with a looping street system, extensive pedestrian and bike trails, and extensive landscaping, as required by City standards.
Guiding Policy 2.1-G 8 Preserve the predominant single-family residential character of Vacaville while providing other housing opportunities. Protect established neighborhoods from incompatible uses.	Yes	The Project includes the development of a variety of housing types that include single-family residential and multi-family residential. Of the 1,410 housing units proposed, approximately 55 percent of the housing units will be traditional single-family residences. Because the Project site is vacant, and because of the location of the proposed Project components vis-à-vis surrounding residential development, established neighborhoods will not be adversely impacted by Project development. Refer to the Noise and Aesthetics sections of this EIR for more detail.
Guiding Policy 2.2-G 3 Ensure that scarce natural resources, such as water, are allocated and utilized to maximize community benefits, and manage growth so that the quantity and quality of public services and utilities within the City provided to existing businesses and residents will not drop below an acceptable level of service because of new development. New development is not responsible for resolving all existing service and facility deficits. Existing development bears some responsibility to fund improvements that will resolve such deficits, and development is likewise responsible for funding the costs of maintenance and depreciation of facilities.	Yes	This EIR provides an in-depth analysis of the Project's potential to impact environmental resources. See the appropriate sections for additional information regarding impacts related to agricultural resources, cultural resources, biological, and public services and utilities.

Goal, Policy, or Objective	Is the Project Consistent?	Explanation
Guiding Policy 2.2-G 10 Ensure that all new urban development within the Planning Area occurs within the City of Vacaville. A single exception is the Elmira area where infill of the townsite area under the jurisdiction of Solano County is anticipated. New urban developments within the City limits are expected to annex to the city of Vacaville as a prerequisite to development.	Yes	The Project is located within the City's Sphere of Influence. As part of the development process, the Project site will be annexed into the city.
Implementing Policy 2.2-I 10 Require new development to pay capital improvement fees for public facilities as necessary to maintain adequate resources and service levels.	Yes	The Southtown Project will fund the construction of required underground public facilities. The Project will also pay its fair share of improvement costs for off-site improvements necessary to support the development. Mitigation measures identified in other sections of this EIR require the Project to fund other improvements.
Implementing Policy 2.3-I 1 Conventional housing can be approved for the 20 acre manufactured housing parks designated east of Leisure Town Road and north of Elmira Road and west of Vanden Road, south of Alamo. This conventional housing may be built in place of some or all manufactured housing only if the Planning Commission and City Council make special findings, based upon the project proposal, that the conventional housing would be as affordable as the manufactured housing types over both the short and long term.	No	The Southtown Project includes a mix of higher-density housing types including apartments, townhomes, attached single-family dwellings, and clustered houses. It is not anticipated that proposed housing will be as affordable as manufactured housing.
LAND USE ELEMENT - Residential Policies		
Guiding Policy 2.5-G 2 Provide a citywide housing mix of approximately 60 percent single-family detached, 20 percent single-family with zero lot lines, duplexes, triplexes, mobile homes, and townhouses, and 20 percent garden apartments and condominiums. To achieve this approximate housing mix citywide, new development areas must contain a larger component of certain housing types, as specified in Policy 2.5-I 3.	Yes	Residential development included within the Southtown Project is considered consistent with this policy. As designed, the Project will provide approximately 778 traditional single-family units, approximately 409 zero lot line single-family units, and approximately 223 apartment units, resulting in housing mix of 55-29-16. The recommended housing mix is approximately 60-20-20.
Guiding Policy 2.5-G 5 Encourage creative site design and architectural quality and variety by a design approval process that provides for a variety of single-family houses and designs and/or multi-family designs.	Yes	The Project will provide a variety of housing types throughout the 290-acre site. The types of homes will vary by type, size, and affordability.

Goal, Policy, or Objective	Is the Project Consistent?	Explanation
Guiding Policy 2.5-G 6 Provide for a transition between higher-density and lower-density housing and require buffers between residential and incompatible land uses.	No	The varying types of residential uses proposed within the Southtown Project have been designed to avoid conflicts between higher and lower density uses. Areas will be separated by greenbelts, parks, and roadways, which will serve to create distinct identities for each residential product. With the exception of the southern Project boundary, there will be no land use conflicts. Development of the Project will be considered in conflict with the continued agricultural uses south of the site.
Guiding Policy 2.5-G 7 Ensure that new residential development shares the cost of providing services and amenities for Vacaville residents.	Yes	The Southtown Project will include the formation of a homeowners association, community facilities district, or Mello Roos district to fund necessary services and amenities.
Implementing Policy 2.5-I 8 Maintain buffers between residential and agricultural areas and between residential areas and industrial parks as required by adopted regulations and Policy Plans. The minimum separation shall be as follows: Between residential and agricultural uses: 500 feet.	No	Land uses north of the site are currently urbanizing as part of the development of the City. The golf course located east of the Project site will serve as a buffer between the Project site and ongoing agricultural operations to the east. As designed, the Project will not provide a buffer as required by this policy along the southern boundary of the Project site where agricultural operations are currently expected to continue. Impacts to agricultural operations resulting from development of the Southtown Project are discussed in Section 3.2, Agricultural Resources of this EIR.
Implementing Policy 2.5-I 10 Require impact fees from developers, as appropriate and necessary, for provision of community facilities and services. Maintain the existing policy that development "must pay its own way."	Yes	The Project will participate in the payment of all required impact fees necessary for the provisions of community facilities and services. Fees will be assessed appropriately for each land use type. Adverse impacts to Vacaville's existing facilities and services are assessed in detail in Section 3.9 of this EIR, Public Services and Section 3.10 of this EIR, Public Utilities.

Goal, Policy, or Objective	Is the Project Consistent?	Explanation
Implementing Policy 2.5-I 13 Require that all residential development meeting one or more of the following criteria be subject to discretionary review as a planned development or similar procedure, consistent with the adopted Planned Development Regulation: • Multi-family projects of 10 units or more; • Mixed housing types (detached vs. attached, etc) • Mixed Use; • A location potentially subject to a natural or man-made geologic hazard including hillside areas; or; • Any project exceeding the minimum density with the land use designation or with 50 units or more.	Yes	The Southtown Project is a mixed use development including components of residential of varying densities, commercial, parks, and public facilities. The Project is being processed by the City as a planned development, and future Project components will be subjected to further discretionary review.
Implementing Policy 2.5-I 14 Design residential neighborhoods to avoid fronting on major streets expected to carry inter-neighborhood or community traffic.	Yes	Residential neighborhoods are oriented to front away from major streets that will carry inter-neighborhood or community traffic.
LAND USE ELEMENT – Commercial Policies		
Guiding Policy 2.6-G 3 Locate shopping centers and neighborhood commercial facilities at the major thoroughfares, and where appropriate, adjacent to multifamily housing, and minimize conflicts between commercial areas and residences by requiring adequate buffers and screening.	N/A	Commercial land uses being proposed as part of the Project will be located in the center of the Southtown portion of the site. It is anticipated that these uses will provide retail and services to the residents of the Project. Land uses adjacent to the commercial areas include single-family residential and town center/community center land uses. Adequate buffers and screening, consistent with adopted City policy, will be required through City staff review of future Project components.
Guiding Policy 2.6-G 9 Maintain the quality of public services by requiring all new commercial development to meet its share of public costs.	Yes	The Project will participate in the payment of all required impact fees necessary for the provisions of community facilities and services. Fees will be assessed appropriately for each land use type. Adverse impacts to Vacaville's existing facilities and services are assessed in detail in Section 3.9 of this EIR, Public Services and Section 3.10 of this EIR, Public Utilities.

Goal, Policy, or Objective	Is the Project Consistent?	Explanation
Guiding Policy 2.6-G 10 Provide new commercial sites in residential areas only in proportion to additional demand so that existing sites are not abandoned.	Yes	A market feasibility study was prepared for this Project to determine the feasibility of proposed commercial land uses in relation to the expected demand from the residential component of the Project (refer to Appendix I). The study found that the planned commercial space will primarily serve the Southtown residences and will have no market or economic impact upon existing commercial uses in the City. Existing commercial sites will not be abandoned as a result of the Project.
Implementing Policy 2.6-I 5 Limit neighborhood commercial sites generally to between 4 and 10 acres, and consider setting specific limits on the size of establishments other than food stores to preserve the opportunities for local-serving businesses and to exclude region-serving stores likely to generate high traffic volumes.	Yes	The Project proposed to develop approximately nine acres of the site with commercial land uses. It is anticipated that these uses will mainly serve the residents of the Southtown Project. The proposed development will not create a region-serving commercial center that would generate high traffic volumes.
PARKS AND RECREATION ELEMENT		
Guiding Policy 4.6-G 1 Develop a high quality public park system that provides varied recreational opportunities accessible to all City residents.	Yes	The proposed Project includes development of approximately 33.5 acres of land dedicated to recreational uses including two neighborhood parks connected through series of greenbelt trails, which provide access to most areas of the development, and a dedicated tot lot park.
Guiding Policy 4.6-G 7 Distribute public parks and recreational facilities throughout the urban service zone according to service standards specified in [the Parks and Recreation] Element.	Yes	Vacaville's park standards are discussed in Section 3.9, Public Services of this EIR. Overall, the Southtown Project is providing 33.5 acres of land dedicated to recreational uses including two neighborhood parks connected through series of greenbelt trails and a dedicated tot lot park. The City requires 4.5 acres of parkland per 1,000 residents, and using this standard, the Southtown Project is required to provide approximately 16-17 acres of parkland for its 3,500-3,900 residents.
Guiding Policy 4.6-G 12 Locate new neighborhood parks adjacent to new elementary schools where possible.	Yes	The proposed Project does not include the dedication of any school sites. Refer to Section 3.9, Public Services for a more detailed discussion of Project impact on schools and recreational services.

Goal, Policy, or Objective	Is the Project Consistent?	Explanation
Implementing Policy 4.6-I 1 Maintain a Public Parks Distribution Standard of 4.5 acres of park for every 1,000 residents with: • 1.8 acres/1,000 residents of neighborhood park • 1.7 acres/1,000 residents of community park • 1.0 acres/1,000 residents of city park.	Yes	See response to Policy 4.6-G 7 above. Refer to Section 3.9, Public Services for a more detailed discussion of Project impact on recreational services.
Implementing Policy 4.6-I 2 Establish typical size and service area standards for neighborhood, community, and city parks as follows: • Neighborhood Parks – 6-9 acres; 0.5 mile service area • Community Parks – 10 to 40 acres; 1.0-2.0 mile service area • City Parks – 100 acres or more; Centrally sited to serve all areas of the City	Yes	See response to Policy 4.6-G 7 above. The Project will contribute, through an established City fee, to the creation of a City park, developed by the City at some time in the future. Refer to Section 3.9, Public Services for a more detailed discussion of Project impact on recreational services.
Implementing Policy 4.6-I 9 Require developers of moderate and high density projects that do not contain standard yards to incorporate private recreation areas into subdivisions and to create homeowners associations or similar mechanisms for developing, supervising, and maintaining such areas.	N/A	The Southtown Project includes development of attached, clustered single-family homes, townhouses, and apartments. The attached, clustered single-family homes will be designed with a localized or pocket park. The design of the townhomes and apartments has not been completed, so it is impossible to assess the Project's compliance with this policy. However, it is typical for such developments to provide its residents with internal, private recreational opportunities, and through further review of specific Project components, the City will require such facilities. The Southtown Project will include the formation of a homeowners association, community facilities district, or a Mello Roos district, which will ensure that all services and amenities are adequately funded including maintenance of private recreation areas.
Figure 5-3 The figure shows two elementary school sites on the Project site.	No	"Vanden West" and "Vanden East" school sites will be deleted.
Figure 6-1 Vanden Road south of Alamo Drive is designated as a 4-Lane Arterial.	No	The designation of Vanden Road, south of Alamo Drive will be changed from "4-Lane Arterial" to a "2-Lane Collector."

Goal, Policy, or Objective	Is the Project Consistent?	Explanation
Figure 6-2 The figure shows Vanden Road south of Alamo Drive as a 4-Lane Arterial.	No	The Project will propose changing the designation of Vanden Road, as indicated above.

Note: N/A = not available, the Project has not been designed in enough detail to determine compliance with the policy. Implementation of the policy through normal City staff review of proposed Project components will ensure compliance.
Source: Vacaville General Plan and Housing Element, Southtown Project Site Plan

The Southtown Project is inconsistent with some of the General Plan policies identified in the table above. Through further City review and entitlement processing, proposed roadways, infrastructure, amenities, and structures will be required to conform to City standards.

In order to approve the General Plan amendment associated with the Southtown Project, the City must determine that the Project is consistent with the goals, objectives, and policies of the current General Plan. The Project is required to maintain a balance of land uses and be compatible with adjoining land uses. The General Plan amendment must not result in detrimental impacts to the health, safety, and welfare of the existing community. General Plan consistency will be reviewed as a part of City Staff application review.

With the adoption of the proposed General Plan Amendment, the Southtown Project will be considered consistent with the goals, objectives, and policies of the City's General Plan.

Vacaville Land Use and Development Code

The Southtown Project has been designed in accordance with the provisions established by the Land Use and Development Code. Future Project elements will be reviewed by City staff for consistency with provisions of the Land Use and Development Code. Mitigation measures necessary to reduce Project-related impacts are identified and addressed throughout the sections of this EIR. Zoning districts will be established as part of the annexation process.

Comprehensive Annexation Plan

The Comprehensive Annexation Plan indicates that the Project site is located within the City's Sphere of Influence, within the Urban Service Area, but outside the existing city limits.

While the CAP emphasizes that growth within the city should be focused to create a compact, efficient community in order to maximize the city's utilities and services, the document recognizes that given the projected growth that will occur over the next decade, conversion of agricultural land is eminent. However, the CAP indicates that the conversion of non-prime agricultural land occur before the conversion of prime farmland. See Section 3-2, Agricultural Resources of this EIR for further discussion of agricultural impacts.

Pursuant to the requirements of the Solano LAFCO, areas of proposed annexation must be located within the sphere of influence, designated for urban uses in the GP, and outside existing city limits.

The Project site is identified as a Long Term Annexation Area in the CAP, indicating a projected annexation between 2006 and 2011. Project development is proposed for 2006 through 2011. The site is considered a new residential growth area. Timing of processing and development is subject to a phasing plan established by the city. Following the adoption of the Project's General Plan amendment, the site would be included within the area identified for Near-Term Annexation. The current Sphere of Influence boundary will not have to be amended to facilitate annexation of the Southtown Project.

Environmental Compatibility Issues

As determined through the analysis conducted for preparation of this EIR, the Southtown Project is expected to result in significant impacts related to various CEQA topics. Topic areas that will be significantly and unavoidably impacted include air quality, agricultural resources, cultural resources, noise, and transportation. The Southtown Project is not expected to significantly impact issues related to aesthetic resources as well as safety and health. Mitigation measures are identified for other environmental topic areas, where feasible, to reduce other impacts.

In accordance with the provisions of the City's adopted Land Use and Development Code Chapter 14.09, the Planned Development process allows for variable compliance with the City's typical development standards. Alternative standards can be approved if they are offset by other improvements elsewhere, to the overall benefit of the Project. In addition, variation in density above base zoning is allowed in projects that include onsite or offsite improvements to the overall benefit of the community in the form of accommodating very-low, low, and/or moderate income groups, and the housing assists in meeting the as yet unmet regional housing allocation of the City.

The variety of housing types and densities included in the Southtown Project are anticipated to balance the City's overall housing stock with an increase in affordable market rate units. The Southtown Project is supportive of the Solano County growth initiative's practice of directing urban development to the existing cities. An analysis of the proposed Project's combination of land uses determined that the Southtown development will be self supportive, meaning that future residents will have opportunities for jobs, access to commercial services, and adequate public facilities.

The inconsistencies with policies intended to reduce environmental impacts of development are considered **potentially significant** and require mitigation.

Mitigation Measure LAN-1

Require that the infrastructure Master Plan for the South Vanden Area facilitate the development of a range of housing densities and opportunities, pedestrian and bicycle friendly design, neighborhood commercial sites and recreational and neighborhood facilities, by including the following requirements:

- **Alternative street cross-sections will be allowed to provide enhanced landscaping, and enhanced pedestrian, bike lane, and bike path facilities.**
- **A network of landscaped pedestrian/bike corridors that connect key elements of the area, such as the regional park and arterial streets.**
- **New development adjacent to existing homes within the City limits shall match or exceed, on the average, the size and character of adjacent homes and lots.**
- **Downstream flooding impacts shall be minimized by providing detention either on- or off-site, or a combination of both.**
- **A financing mechanism for all public facility improvements shall be established before development occurs.**
- **Nut Tree Road and Vanden Road shall be widened to the City standard width through the project sites for all projects that front on these streets.**
- **Leisure Town Road shall be widened and improved to the standards for the Jepson Parkway along the frontage of all projects that abut to Leisure Town Road.**

- **Foxboro Parkway shall be extended between Nut Tree Road and Vanden Road.**
- **A one-acre site for a future fire station site shall be reserved, subject to City approval.**
- **A 14-acre site near Vanden Road shall be reserved for community uses.**
- **The apartment complex on Leisure Town Road shall begin construction in the initial phases of development of the Project area.**
- **Public areas adjacent to Alamo Creek shall be landscaped to enhance the view of the creek channel, within the requirements of SCWA.**
- **Commercial buildings shall be no more than an average of 30 feet in height, and be designed to front on the sidewalk, with parking at the rear of the property, when feasible, so as to enhance neighborhood aesthetics and to encourage pedestrian-friendly design.**
- **Community facilities, such as places of worship, schools, and sports facilities will be a permitted use in all areas of the South Vanden Area.**

With incorporation of identified mitigation, the impact is considered **less than significant**.

Impact LAN-2: Consistency with the Draft Solano County Habitat Conservation Plan

The provisions of the draft Solano County Habitat Conservation Plan are discussed in detail in Section 3.4, Biology of this EIR. The Southtown Project will not result in impacts to biological resources that are inconsistent with the Conservation Plan. The impact is considered **less than significant.**

Impact LAN-3: Induce Substantial Population Growth

The Southtown Project will result in the conversion of approximately 300 acres of rural land to urban land uses. The Project is located outside the current city limits but inside the urban service area identified within the current Comprehensive Annexation Plan (CAP) as an area for annexation between 2006 and 2015. The anticipated demand for housing in Vacaville cannot be met solely through the areas identified for annexation between 2001 and 2006.

The Project has the potential to result in additional development of the surrounding area and induce substantial population growth through the extension of public services and circulation improvements into an area that currently does not have access to these services. However, Vacaville implements several mechanisms that result in the avoidance of growth-inducing impacts seen in other jurisdictions when areas outside existing city boundaries are developed. The most effective of these mechanisms is the annual residential allocation system established by the Planned Growth Ordinance discussed earlier in this section. Annual residential growth is monitored and regulated by the City. Other mechanisms that serve to regulate growth include provisions associated with development agreements and the requirement for payment of development fees. Vacaville expects developments to "pay their own way," meaning that developers are required to pay for all necessary infrastructure and provide access to non-renewable resources such as water, electricity, and natural gas, without adversely impacting the existing residents of the city. Therefore, regardless of the availability of urban services, development is regulated to the extent that substantial population growth will not occur.

The City of Vacaville will allocate 19 percent of the available residential building permits to the Project. Under this allocation, the Southtown Project will absorb roughly 200 single-family units per year, over a period of six years. Development of the Southtown Project will result in an approximately 3,500-3,900-person increase in the population of the Vacaville area. Compliance with provisions established by the City of Vacaville will result in the avoidance of substantial population growth resulting from the proposed Project. The impact is considered **less than significant.**

3.8 Noise

This section describes noise impacts resulting from site preparation, construction, and operation of the Southtown Project, as described in Section 2.0, Project Information. Noise impacts are considered both in the short-term and in the long-term. Short-term effects are those resulting from construction activities. Long-term effects are the result of increased traffic in the area attributable to the Project; impacts from operation of the proposed residential, commercial, and civic uses; and impacts associated with exposure of residential and other planned sensitive land uses to sources of existing noise.

Background

Sound is created when an object moves causing vibration of sound pressure waves in the air. Noise is unwanted sound, measured on a decibel scale to allow practical measurement and characterization. The decibel scale can be adjusted for community noise impact assessment to consider the additional sensitivity to different pitches (through the A-weighting mechanism) and to consider the sensitivity during evening and nighttime hours (through the Community Noise Equivalent Level and Day-Night Average). Figure 3.8-1 illustrates noise associated with common activities to demonstrate how noise levels relate to measurements.

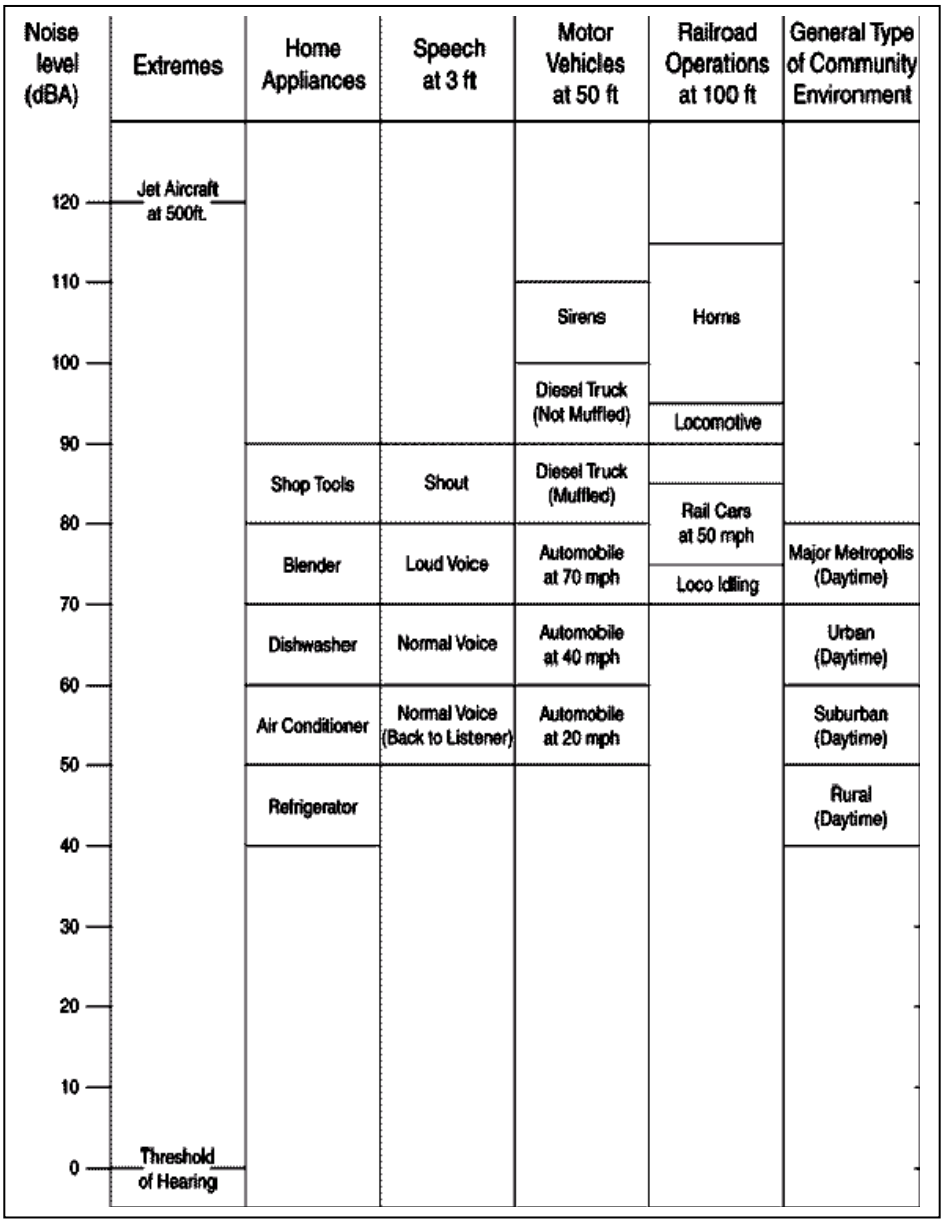
Decibels are logarithmic units, so sound levels cannot be added arithmetically. Sound pressure level from two equal sources is approximately 3 dB greater than the sound pressure level of just one source. For example, two bulldozers producing 85 dB each will combine to produce 88 dB, rather than 170 dB. A 3-dB increase in the sound pressure level is just detectable by the human ear. An increase or decrease of 10 dB in the sound pressure level is perceived as a doubling or halving of the sound intensity.

Sound intensity decreases in proportion with the square of the distance from the source. Generally, sound levels for a point source will decrease by 6 dB(A) for each doubling of distance. Sound levels for a line source, such as a roadway, decrease by approximately 3 dB(A) for each doubling of distance. Soft surfaces, such as farmland and grass, result in a 4.5 dB(A)-decrease per doubling of distance.[1]

Day-Night Average Sound Level

The day-night average sound level represents sound exposure averaged over a 24-hour period (DNL or L_{dn}). DNL values are calculated using hourly L_{eq} values, with the L_{eq} values for the nighttime period (10:00 P.M.-7:00 A.M.) increased by 10 dB to reflect the greater disturbance potential from nighttime noises.

Figure 3.8-1
Typical Noise Levels Associated with Various Activities



Source: Federal Railroad Administration, 2003.

Community Noise Equivalent Level

The community noise equivalent level (CNEL) applies weighting factors for both evening *and* nighttime sound levels. For CNEL, L_{eq} values for the evening period (7:00 P.M.-10:00 P.M.) are increased by 5 dB, while L_{eq} values for the nighttime period (10:00 P.M.-7:00 A.M.) are increased by 10 dB.

Environmental Setting

In Vacaville, the most significant source of noise is attributable to vehicles traveling on Interstate 80. Secondary sources of noise include Interstate I-505 and local arterials. In the Project area, noise sources include vehicles traveling on Vanden Road, Leisure Town Road, and other nearby roadways; trains passing on the Union Pacific rail line at the southeastern boundary of the Project site; aircraft overflights, especially aircraft operations related to Travis Air Force Base and Nut Tree Airport; agricultural operations; and, vocalizations and other urban sources of noise emanating from the developed areas north and northwest of the Project site. Existing ambient noise levels on the interior of the site and away from area roadways are in the range of 40 – 43 L_{eq}.[2] The petroleum pumping facility directly south of the Southtown Commons portion of the Project site generates approximately 60 dB(A) at 50 feet from the machinery and 30 feet from the fence line around the perimeter of the pumping facility. The pipeline associated with this pumping facility is planned to be relocated several miles from the Project site.[3] Future 60 DNL noise contours extend approximately 600 feet from the Union Pacific rail line along the southeastern boundary of the Project site and approximately 650 feet from the centerline of Leisure Town Road.[4]

Regulatory Setting

Noise is regulated by government agencies at the federal and State levels, though authority and responsibility for regulating, monitoring, and enforcing noise regulations most typically occurs at the local level. Existing regulations provide a basis for examining the impacts of projects under CEQA, and the enforcement of these regulations can reduce noise-related impacts of projects.

Federal Railroad Noise Regulations

Railroad Noise Emission Compliance Regulations contained in the Code of Federal Regulations, Title 49, Volume 4, Parts 200 to 399 (revised as of October 1, 2000) require railroad operators to conduct noise emission testing. Any railroad that uses railroad equipment that is noise defective or operates in excess of noise standards (Table 3.8-1) shall:

- Correct the noise defect;
- Remove the noise defective railroad equipment from service; or
- Modify the car coupling procedure to bring it within the prescribed noise limits.

Table 3.8-1
Federal Noise Standards for Moving Trains

Application	Maximum Allowable Noise Level	Measurement Location from Train
Locomotives Manufactured before 1980	96 dB (A)	100 ft
Locomotives Manufactured after 1980	90 dB (A)	100 ft

Source: Federal Railroad Administration web site, www.fra.dot.gov

The Federal Railroad Administration also specifies a *minimum* sound level of 96 dB, 100 feet forward of the locomotive for railroad horns, which are used to warn motorists and others of incoming trains.[5]

California State Land Use Compatibility Standards

The California Department of Health Services Office of Noise Control studied the relationship between noise and various land uses and provided land use compatibility guidelines for the noise elements of local general plans. The guidelines are the basis for most noise element land use compatibility guidelines in California. The Land Use Compatibility Standards are presented in Table 3.8-2 below.

Table 3.8-2
Maximum Allowable Ambient Noise Exposure for Various Land Uses

Land Use	Suggested Maximum L_{dn}
Residential - Low Density	60
Residential - High Density	65
Transient Lodging	65
Schools, Libraries, Churches, Hospitals	70
Auditoriums	70
Playgrounds, Parks	70
Commercial	70
Industrial	75

Note: L_{dn} = day-night average sound level.
Source: State of California, Office of Planning & Research 1990.

Vacaville Noise Standards

Vacaville's General Plan includes Noise Compatibility Guidelines for Transportation Sources, which identify normally acceptable noise levels of up to 60 dB (DNL) for residential development. The General Plan also identifies Noise and Land Use Compatibility Policy for Non-Transportation Sources, which is categorized by time of day, as well as interior versus exterior receptor locations (Table 3.8-3).

Table 3.8-3
Vacaville Compatibility Policy for Non-Transportation Noise Sources

Land Use Category	Noise Level Descriptor	Exterior Noise Levels		Interior Noise Levels	
		Daytime (7:00 A.M. – 10:00 P.M.)	**Nighttime** (10:00 P.M. – 7:00 A.M.)	**Daytime** (7:00 A.M. – 10:00 P.M.)	**Nighttime** (10:00 P.M. – 7:00 A.M.)
Residential	Hourly L_{eq} dB(A)	50	45	45	35
	Maximum dB(A)	70	65	--	--

Source: City of Vacaville General Plan, 1990.

The non-transportation noise source standard is intended to be used for industrial operations, outdoor recreational facilities, HVAC units, loading docks, construction equipment.

Methodology

Existing literature, application of accepted noise prediction techniques, and known characteristics of sound were used to predict changes in ambient noise levels resulting from the Project. Specific existing and potential noise sources evaluated in this section include off-site traffic, construction noise, and on-site traffic and other internal noise impacts. Existing noise levels on the Project site were determined through 20 minutes of noise monitoring at various on-site locations using a Bruel & Kjaere Model 2230 noise level meter.

Off-Site Traffic

To describe noise levels associated with Project traffic, two applications based on the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) were used. The FHWA model is the analytical method used by most State and local agencies for predicting traffic noise impacts. The FHWA model yields estimates of hourly L_{eq} values for free-flowing traffic conditions. To predict DNL values (otherwise known as L_{dn}), noise levels were averaged over 24 hours, the day/night distribution of traffic was calculated, and nighttime penalties were applied. The application uses assumptions about the type of surface between the noise emitter and receiver, the traffic mix, and atmospheric conditions, which are adjusted to match Project conditions. Day/night splits and peak to daily traffic splits were available from the traffic impact analysis that was conducted to support this EIR. URBEMIS traffic assumptions for this region were used for the auto/medium truck/heavy truck distribution. If soundwalls exist in areas analyzed for impacts, they were included in the modeling (which involved use of LEQV2 model, courtesy of Caltrans). If soundwalls do not exist, they were modeled to show the benefit to reduction of noise relative to City standards.

Construction

During the construction phases of the Project, construction noise would add to the noise environment in the immediate vicinity. Construction would generate maximum noise levels ranging

from 85 to 90 dB at a distance of 50 feet (Table 3.8-4). Noise experienced at adjacent land uses would be reduced by distance (6 dB for every doubling of distance), air absorption (1-2 dB per 1,000 feet), and wind and thermal attenuation (1 dB per 1,000 feet).

Table 3.8-4
Construction Equipment Noise

Type of Equipment	Typical Noise Level, dB(A) 50 Feet From Source
Backhoe	80
Grader	85
Loader	85
Roller	75
Bulldozer	85
Truck	88
Scraper	89

Source: Federal Transit Administration, 1995.

Urban Activities

Mowers, blowers, weed cutters, and tractors can produce noise levels of up to 80 dB(A) at a distance of 100 feet. Newer equipment is outfitted with mufflers, which reduce the noise output. Leaf blowers, for example, have a noise output of 65 decibels at 50 feet. Mechanical equipment impacts are estimated using assumed noise generator and noise receptor locations and typical noise generation levels.

Railroad

Railway operations generate a number of noise impacts related to power unit, roof exhaust, cooling fans, air compressors, brakes, couplings, warning horns, wheel/rail interface, passing over switches (points), crossings, and maintenance of the tracks.[6]

This EIR uses Federal Railroad Administration (FRA) methodology and spreadsheets designed to calculate noise impacts associated with moving trains and train horns on various land uses. The Federal Railroad Administration has developed a noise computation method to assess the noise impact of train horns near railroads using models based on a Source-Path-Receiver framework. The model uses information about typical train and horn volumes, and adjusts the noise level based on the intervening distance, obstacles, terrain features and structures. Freight cars typically involve noise levels of approximately 80-90 dB(A) at 50 feet and passenger trains, such as the Capitol Corridor trains, which pass by the Project site, involve a lower amount of noise in the range of 75-80 dB(A).[7,8] According to Union Pacific, a total of approximately 36 commuter and passenger trains and approximately 34 freight trains operate daily on the tracks adjacent to the Project site.

Noise levels resulting primarily from train traffic along the Union Pacific route were measured at about 82 DNL at a distance 30 feet from the centerline of the tracks, or about 70 DNL at 200 feet

with 24 individual train passings.[9] An approximately 30-foot soundwall located along the southeastern side of the proposed commercial self storage uses would provide attenuation of approximately 8 decibels.[10] According to information from FRA, approximately 78 percent of the daily trains in this area operate during the daytime, and the same assumption is made in this noise analysis.

The closest residential property to the center of the railroad tracks on the proposed Project site is located about 200 feet to the northwest. Self storage facilities are proposed between the railroad tracks and the residential development on the Southtown Commons portion of the Project site.

Train horns produce maximum noise level of approximately 100 dB(A) measured at 100 feet in front of the train.[11] Horns produce a lower amount of noise behind and to the side of the train. Automated horn systems are quieter, producing sound of approximately 87.0 dB(A).[12] Automated horn systems are not proposed for the Project vicinity.[13] There are two crossings in the Project vicinity, one at Canon Road south of the Project site and one at Alamo Drive northeast of the Project site.

Thresholds of Significance

Project impacts would be considered significant if the Project would:

- Generate intermittent or temporary noise that substantially disrupts or interferes with day-to-day operations of surrounding land uses; or,
- Result in noise exposure that would be considered normally unacceptable in the noise compatibility guidelines used by the City of Vacaville in the Noise Element of the General Plan.
- Result in a permanent increase of three or more decibels above the ambient noise levels in the Project vicinity existing without the Project;

Environmental Impact and Mitigation Measures

Impact N-1 Construction Noise and Vibration Impact

Construction activities will add to the noise environment in the immediate vicinity of the Project. Construction equipment used for earthmoving generate noise levels of 70–90 dB(A) at a distance of 50 feet when operating. At times, equipment is used intermittently, while at other times, it is used almost continuously, producing different noise impacts. The worst-case scenario would involve concurrent operation of the loudest construction equipment in the same portion of the Project site, such as a bulldozer [87 dB(A)], a backhoe [90 dB(A)], a grader [90 dB(A)] and a front loader (82 dBA).[14] This combination of equipment would produce a maximum noise level of approximately 94 dB(A) measured at 50 feet from the construction site. When combined, the sound level of a scraper, truck, and bulldozer would be approximately 92 dB(A) measured at 50 feet.[15] If a grader

[85 dB(A)] and a scraper [89 dB(A)] operate concurrently, the combined sound level would be approximately 90 dB(A) at a distance of 50 feet from the construction site.[16]

Occasional noise levels greater than 60 dB(A) will occasionally occur at locations within about 1,600 feet of a construction site. Occasional noise levels greater than 70 dB(A) will occur at areas within approximately 700 feet of the construction site. Existing noise barriers between the proposed construction site and noise receptors will further reduce the level of noise. Effective noise barriers can reduce noise levels by 10 to 15 decibels, cutting the loudness of traffic noise in half. Soundwalls at adjacent residential properties to the west are constructed of stone and built into earthen berms, measuring at least eight feet in effective height. Soundwalls to the north of the Project site are constructed of wood, and would be less effective in reducing the noise impact of on-site construction.

Construction vibration can irritate people, and at intense levels, can result in building damage. Annoyance can occur when construction vibration maintains levels above the threshold of human perception for extended periods. The impact of ground-borne vibration is dependent on the soil type at the construction site, the type and duration of equipment used, construction of affected structures. In general, however, construction could cause annoyance for residents within about 50 feet of construction work.[17] When construction equipment items approach the approximate distances listed in Table 3.8-5, there would be the potential for cosmetic or structural impact to nearby buildings and other structures. Existing residences north of the Project site are separated by a Solano Irrigation District canal and easement area, which is more than 50 feet in width. Other adjacent development is separated from the Project site by public streets, providing a buffer of at least 50 feet from proposed construction areas. However, construction equipment moving on- and off-site may operate on city streets within 50 feet of residential structures.

Table 3.8-5
Construction Equipment Vibration Impact Distances

Equipment	Distance to Vibration Building Damage (feet)
Pile Driver, Impact	50
Pile Driver, Vibratory	35
Large Bulldozer	< 10
Loaded Trucks	< 10

Source: California-Nevada Super Speed Train Commission, 2002.

The impact is **potentially significant** and requires mitigation.

Mitigation Measure N-1

- **Hours of noise producing construction shall be from 7:00 A.M. to 6:00 P.M., Monday through Saturday.**
- **Construction activities shall conform to the following standards: (a) there shall be no start-up of machines or equipment, no delivery of materials or equipment, no cleaning of machines or equipment and no servicing of equipment except during the permitted hours of**

construction; (b) radios played at high volume, loud talking and other forms of communication constituting a nuisance shall not be permitted; and (c) there shall be no construction on Sundays or legal holidays. Exceptions to these time restrictions may be granted by the Community Development Director for one of the following reasons: (1) inclement weather affecting work; (2) emergency work; or (3) other work, if work and equipment will not create noise that may be unreasonably offensive to neighbors so as to constitute a nuisance. The Community Development Director must be notified and must approve the work in advance.

- **Noisy construction equipment shall not idle for more than 10 minutes (combustion engine construction equipment is limited to five minutes idling time by mitigation included in the Air Quality section of this EIR).**
- **Temporary acoustic barriers shall be installed around stationary construction noise sources located within 1,600 feet of any residential property.**
- **Construction equipment and trucks used for construction shall utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) in order to minimize construction noise impacts on nearby noise-sensitive uses.**
- **Vibratory pile drivers shall be used instead of impact pile drivers whenever possible. If vibratory pile drivers are not feasible, acoustical enclosures shall be provided as necessary to ensure that pile driving noise does not exceed 70 dB(A) at the nearest occupied residential property line. Where feasible, pile holes shall be pre-drilled to reduce potential noise and vibration impacts.**
- **Loaded trucks used in construction shall not travel at speeds higher than 25 miles per hour in the Project vicinity and shall avoid driving over bumps, and shall reduce speed while driving over bumps that cannot be avoided to reduce the incidence and intensity of vibration as experienced by adjacent residents.**
- **No pile driving shall occur, nor shall any bulldozers operate within 50 feet of any existing residential structure located adjacent to the Project construction site.**
- **No loaded trucks shall operate on the proposed Project construction site within 50 feet of any existing residential structure.**

With the incorporation of the identified mitigation measures, the impact is considered **less than significant**.

Impact N-2 Traffic Noise Impact

The proposed Project will generate and attract traffic, the operation of which will produce off-site noise. Project traffic, in combination with other traffic in the area, would result in noise in excess of City standards (Table 3.8-6) under the existing plus approved traffic conditions. Cumulative noise impacts are addressed in Section 5.0, Cumulative, Growth-Inducing, and Irreversible Impacts. Project impacts are summarized below:

- ***Alamo Drive between Nut Tree and Vanden.*** Approximately 17 homes on the south side of Alamo Drive would experience noise in excess of standards. However, according to existing plus approved plus Project traffic conditions, because of Project roadway construction and the resulting redistribution of traffic, the traffic noise *without* the Project at the homes along Alamo Drive is estimated to be higher than the level of noise *with* the Project (refer also to the Traffic

report, which is included in its entirety as Appendix H). There are existing soundwalls along this roadway segment. The impact is **less than significant**.

- ***Alamo Drive between Vanden and Leisure Town.*** Under the existing plus approved traffic conditions, the Project would increase the noise level by less than one decibel. The impact is **less than significant**.
- ***Alamo Drive east of Leisure Town Road.*** This is an agricultural area – noise standards for agricultural areas are different than those for residential areas or other noise sensitive land uses. The impact is **less than significant**.
- ***Leisure Town Road north of Alamo.*** Soundwalls with berms exist to attenuate noise for homes east of Leisure Town Road. Additional distance attenuation and attenuation from soundwalls with earthen berms would prevent exceedance of noise standards along this roadway segment for existing residences. The impact is **less than significant**.
- ***Nut Tree Road between proposed Collector C and Alamo Drive.*** Existing residences west of Nut Tree Road have soundwalls and earthen berms to reduce noise levels. However, proposed Project homes would be significantly impacted by roadway noise if similar noise attenuation features are not included as a part of the Project. This is a **potentially significant** impact. The existing school on the east side of Nut Tree south of Alamo does not have any soundwall along the roadway, and therefore noise levels on the property would exceed noise standards for school sites. Building attenuation (approximately 20 decibels) and the distance of school buildings from the roadway would ensure that noise levels would not exceed the 45-decibel interior noise limit, at which speech interference would potentially occur. The Project would reduce traffic noise under the existing plus approved traffic conditions. The impact is **less than significant**.
- ***Leisure Town Road between Collector C and Collector E, and between Collector E and Alamo Drive.*** Soundwalls or some type of attenuating features would be required for proposed Project single-family residences along Leisure Town Road to meet the 60-DNL noise standard. This is a **potentially significant** impact.

These **potentially significant** impacts require mitigation.

Mitigation Measure N-2

Project applicant shall have conducted and implement the recommendations of an acoustical analysis, consistent with Title 24 building requirements and City General Plan Noise Element policy, to guide the design and location of sound attenuation features for the Project residences proposed along Leisure Town Road, and Vanden Road.

The mitigation measure will reduce traffic-related noise impacts on residential development proposed within the Project site to a **less-than-significant** level.

Table 3.8-6
Traffic Noise with the Project (without soundwalls)

ROADWAY SEGMENT	Existing + Approved Projects		
	without Project	with Project	Change
	DNL	DNL	
Alamo Dr/ West of Nut Tree Rd*	68.08	68.41	0.33
Alamo Dr/ Nut Tree Rd to Vanden Rd*	67.47	66.49	-0.97
Alamo Dr/ Vanden Rd to Leisure Town Rd*	63.78	64.34	0.56
Alamo Dr/ East of Leisure Town Rd	61.39	62.64	**1.25**
Nut Tree Rd/ North of Alamo Dr*	68.13	68.40	0.27
Vanden Rd/ South of Leisure Town Rd	67.40	67.66	0.26
Leisure Town Rd/ North of Alamo Dr*	66.56	68.04	**1.48**
Nut Tree Rd/ South of Collector C	67.72	62.62	-5.09
Nut Tree Rd/ Collector C to Alamo Dr*	67.72	67.52	-0.20
Vanden Rd/ Leisure Town Rd to Collector C	67.47	49.10	-18.37
Vanden Rd/ Collector A to Collector B	69.25	56.44	-12.81
Vanden Rd/ Collector A to Alamo Dr	67.47	62.61	-4.86
Leisure Town Rd/ Vanden Rd to Collector C	68.35	66.06	-2.29
Leisure Town Rd/ Collector C to Collector E	68.35	65.75	-2.60
Leisure Town Rd/ Collector E to Alamo Dr	68.35	67.05	-1.30

Notes: *Soundwalls exist in the project vicinity along roadways to provide attenuation for existing residential areas. The effectiveness of these soundwalls was modeled as a part of the noise analysis that supports this EIR, as explained above. Within the Project site, normal walls without berms were modeled. Traffic noise modeled assuming no grade and at 43 feet from the centerline of each roadway. Along some of the roadways, such as Leisure Town Road north of Alamo Drive, some of the existing residential properties have wider rights-of-way with sidewalks, soundwalls, and earthen berms.

Source: LEVQ2, courtesy of the California Department of Transportation; traffic data from Fehr & Peers, 2003; modeled by Cotton/Bridges/Associates, 2003 using methods of the Federal Highway Administration *Highway Traffic Noise Model*, 1978.

Impact N-3 Noise and Vibration Impact to Proposed Project Land Uses

In addition to Project noise affecting off-site land uses, the Project itself will be subject to existing noise in the vicinity, as well as noise associated with proposed activities on-site. Traffic noise impacts are addressed under Impact N-2. Noise will be produced by mechanical equipment mounted on building tops and elsewhere, lawn maintenance equipment, and by other miscellaneous urban noise sources. Railroad noise in the Project vicinity will affect proposed land uses. The petroleum pumping facility would not generate noise above the ambient noise level that would substantially affect proposed on-site residences. As mentioned earlier, the pumping facility will become inactive after the pipeline is relocated.

Transportation noise sources produce significant impacts if they result in a noise environment of more than 60 dB(A) DNL for low-density residential development or 65 dB(A) DNL for high-density residential development. As specified in the Thresholds of Significance section, non-transportation noise sources would produce significant impacts if exterior maximum levels exceed 70 dB(A) or hourly levels exceed 50 dB(A) during the daytime. During the nighttime, exterior thresholds are 65

dB(A) at a maximum and 45 dB(A) on an hourly basis. Impacts would be significant if hourly interior daytime noise is more than 45 dB(A) L_{eq} or hourly interior nighttime noise environment of more than 35 dB(A) L_{eq}.

Railroad noise (including horns, engines, and freight cars) is calculated as follows:

- According to the Vacaville General Plan, future 60-DNL noise contours extend approximately 600 feet from the Union Pacific railroad tracks adjacent to the Project site. This would result in exceedance of the City's 60-DNL residential noise standard for approximately half of the residences proposed in the Southtown Commons portion of the Project site. For each row of buildings between the noise receptor and noise source, approximately 1.5 to 4 decibels of noise attenuation would apply.[18,19] Despite attenuation attributable to intervening structures, such as the commercial self-storage proposed adjacent to the tracks, the ambient noise environment will exceed City noise standards for some of the residential development proposed within 600 feet of the railroad tracks. This is a **potentially significant** impact.

Some amount of noise would be generated by the commercial and civic uses proposed for the center of the Project site. Substantial noise could be generated by the proposed fire station and operation of emergency vehicles. This noise would be intermittent, and the operation of emergency vehicles is expected as a part of any urban development. Noise standards related to transportation are expressed in 24-hour averages. Intermittent, occasional sources of noise, such as that related to the operation of fire trucks and related emergency equipment, would not factor substantially into a 24-hour average. The Project does not propose manufacturing or large-scale commercial development that would induce large amounts of traffic or engage in noisy production processes. The commercial uses are expected to be office and retail in nature, and as such, would not be anticipated to produce noise levels out of character with similar urban development or in excess of adopted City noise standards. The town center/civic area in the center of the Vanden Road traffic circle is buffered from adjacent residential uses by the Vanden Road right-of-way, which would reduce noise levels detected at adjacent residential areas.

The operation of lawn maintenance equipment with combustion engines will produce noise levels in excess of significance thresholds if proper muffling and scheduling is not utilized.

Typical construction attenuates outdoor noise by 20 dB(A) with windows closed and 10-12 dB(A) with windows open (Table 3.8-7). [20] Properly designed noise barriers reduce noise levels by approximately 10 dB.

Table 3.8-7
Building Noise Reduction Factors

Building Type	Window Condition	Noise Attenuation
All	Open	10 dB
Light Frame	Ordinary Sash (closed)	20 dB
	Storm Windows	25 dB
Masonry	Single Glazed	25 dB
Masonry	Double Glazed	35 dB

Source: U.S. Department of Transportation Federal Highway Administration, 1995.

The impact is **potentially significant**.

Mitigation Measure N-3

- **All combustion engine landscape maintenance equipment used on-site shall be outfitted with manufacturer-recommended mufflers and all other manufacturer-recommended, noise-reducing components to reduce the noise output to a maximum of 65 dB(A) at 50 feet.**
- **Landscape maintenance equipment shall not be used after 10:00 P.M. or before 7:00 A.M.**
- **The wall of the commercial self-storage uses proposed along the southeastern portion of the Southtown Commons portion of the Project site near the railroad shall be designed as a noise attenuation wall, consistent with City design standards.**

With the incorporation of the mitigation included above and mitigation included in the Air Quality section of this EIR encouraging the use of electric landscape maintenance equipment, the impact related to landscape equipment is considered **less than significant**.

Given the proximity of proposed residences to the train tracks and the uncertainty of future railroad operations, despite the use of commercial self-storage buildings with one wall designed specifically to attenuate noise, the noise level associated with locating residences in such close proximity to the railroad is considered **significant and unavoidable.**

Impact N-4 Increase in Noise above Ambient Level

The Project would result in a permanent increase of three or more decibels above the ambient noise levels without the Project. Existing ambient noise levels on the interior of the site and away from area roadways are in the range of 40 – 45 dB(A) L_{eq}. The petroleum pumping facility directly south of the Southtown Commons portion of the Project site generates approximately 60 dB(A) at 50 feet from the machinery and 30 feet from the fenceline around the perimeter of the pumping facility. This facility will become inactive once the adjacent pipeline is relocated. Noise levels on-site adjacent to existing roadways, such as Leisure Town Road, Vanden Road, and Nut Tree Road are in the range of approximately 60 to 65 dB(A) L_{eq}. With the extent of development proposed as a part of the Project and the approximately 13,000 daily automobile trips the Project will add to area roadways, the ambient noise level on certain portions of the site and off-site locations will increase by three or more decibels.

This is a **significant and unavoidable** impact of the Project. Urban development of any scale would increase ambient noise levels compared to existing conditions. The No Project alternative, analyzed in Section 4.0 of this EIR would reduce impacts related to the ambient noise level.

Notes and References

[1] U.S. Department of Transportation Federal Highway Administration. *Highway Traffic Noise Analysis and Abatement Policy and Guidance*. 1995

[2] L_{eq} is another variation on the decibel scale that represents a time-averaged noise level.

[3] California State Lands Commission. *Draft Environmental Impact Report for Concord to Sacramento Petroleum Products Pipeline Project*. June 2003
[4] City of Vacaville. 1990 *Vacaville General Plan* (as amended through 1999).
[5] Code of Federal Regulations No. 49, Part 229, Paragraph 129, Audible Warning Device. 1991.
[6] Network Rail web site, 2003.
[7] Beranek, Leo L. *Acoustical Measurements*. Acoustical Society of America. June 1, 1988.
[8] Melville C. Branch and R. Dale Beland. *Outdoor Noise in the Metropolitan Environment*. City of Los Angeles. 1970.
[9] City of Davis. *General Plan*. 2001.
[10] Using methods in the technical publication *Road and Rail Noise: Effects on Housing* sponsored by the Canada Mortgage and Housing Corporation and Division of Building Research, National Research Council of Canada, 1981.
[11] U.S. Department of Transportation, Federal Railroad Administration. *Study of the Acoustic Characteristics of Railroad Horn Systems*. July, 1993.
[12] The FRA standard for audible warning devices does not apply in this situation.
[13] Wayne Horiuchi. Personal correspondence. August 11, 2003.
[14] California State Coastal Conservancy, U.S. Army Corps of Engineers. *Hamilton Wetland Restoration Plan EIR/EIS*. 1998.
[15] State Water Resources Control Board. *Farad Diversion Dam Replacement Project Draft Environmental Impact Report*. March 2002.
[16] City of Glendale. *Environmental Impact Report for Oakmont View Phase V Volume I*. February 2002.
[17] California Public Utilities Commission. *Jefferson-Martin 230 kV Transmission Line Project Draft EIR*. 2003.
[18] Canada Mortgage and Housing Corporation and Division of Building Research, National Research Council of Canada. *Road and Rail Noise: Effects on Housing*. 1981.
[19] Federal Railroad Administration and Nevada Department of Transportation. *Reno Rail Corridor Final EIS*. 2000.
[20] County of Orange. *El Toro Master Development Plan. Appendix E, Technical Report: Noise Analysis. Airport System Master Plan*. 1999.

3.9 Public Services

Public services are provided to existing Vacaville residents and businesses by a variety of municipal departments. These services will need to be extended to future residents and employees of the proposed development. This section describes the municipal services provided by the City of Vacaville, and discusses the existing service delivery mechanisms and the City's targeted service standards. A full market feasibility and fiscal impact report is included as Appendix I to this DEIR.

Environmental Setting

Fire and Emergency Medical Services

The Vacaville Fire Department provides fire protection services within Vacaville. In addition, the fire department provides emergency medical services (EMS) within the City and in adjacent county areas that include an additional 160 square miles of unincorporated territory. Currently, the Vacaville Fire Department operates four fire stations. The closest existing station to the Southtown project area is Station 74, located at 1850 Alamo Drive. Currently, the fire department employs 47 sworn firefighters, seven civilian employees, 27 paramedic personnel, and 42 Emergency Medical Technicians (EMTs)[1]. Each station is staffed 24 hours per day with an average of three professional firefighters per station. According to the Assistant Fire Chief there are generally between two and four firefighters in all stations, except Station 3, which has either three or five firefighters at any given time[2].

Fire Protection

The Fire Department has established an emergency response service standard of arriving at "critical fire and medical calls" within seven minutes, 90 percent of the time[3]. The fire department anticipates that its existing deployment of fire stations, apparatus, and personnel will not be adequate to maintain its service standards while extending service to the Southtown project area. The Fire Department has completed a comprehensive fire services needs assessment that includes a determination of necessary infrastructure and facilities needed to support city expansion, including the Southtown project. This assessment concluded that an additional fire station will be necessary to support the Southtown project. An agreement is in place to require the developer to construct this station as mitigation for fire service impacts.

Emergency Medical Service (EMS)

The Fire Department maintains the same emergency response service standard for EMS as it does for fire protection. Since the fire department uses the same facilities and apparatus to provide EMS as it does to provide fire protection, decisions regarding the need for additional stations, equipment, and personnel to provide EMS will be driven by decisions regarding needs for new fire protection

resources. For example, if an additional fire station is needed in order to maintain fire protection standards, then this additional fire station will also be used to provide extended EMS services.

Law Enforcement Services

The City of Vacaville Police Department provides law enforcement services within the incorporated area. 108 sworn officers and 92 civilian personnel provide policing and related services to residents of Vacaville,[4] as of June 2003; however, the department has indicated that the number of sworn officers will decrease to 106 due to the fact that the department is losing some grant funding.[5] The Vacaville Police Department has one central precinct that serves the entire city, along with several substations.

The Police Department uses an array of criteria to measure its performance, including average response time and number of calls per officer per year. It currently has an average response time to priority one calls of 5:45 minutes, and an average response time to priority two calls of 13:22 minutes.[6] These current response times are faster than the Department's adopted standard of 6:00 minutes for priority one calls, and 15:00 minutes for priority two calls.[7] At the same time, there are approximately 1,000 calls per officer per year, higher than the 700 annual calls that the department targets per officer.[8]

Public Works Services

The Vacaville Public Works Department is responsible for providing several public services. The department has individual divisions responsible for parks and open space, parks maintenance, engineering services, and transit operations. Each division will potentially be affected by the Project.

Parks Division and Park Maintenance

The Vacaville Public Works Department and private commercial recreation businesses provide parks and other recreational services for Vacaville residents. Vacaville has established a level of service standard for public parks and recreation facilities of 4.5 acres of land for every 1,000 residents[9]. However, as of 2001 the City achieved a standard of 3.34 acres per 1,000 residents.[10] The Parks Division measures its performance in terms of percentages of parks maintained at a "Mode 2" level of service. It has a service standard of maintaining parks at a 95 percent level. All maintenance areas meet or exceed the service standard with the exception of pruning, which falls short due to staff shortages.[11]

Engineering Services and Transit Operations

The Public Works Department also maintains the roads and roadside landscaping within Vacaville. State gas tax subventions pay for about 40 percent of the street maintenance costs, and the remaining 60 percent of street maintenance funds come from the General Fund[12]. Local property owners fund roadway landscaping maintenance services through lighting and landscaping assessment fees.

Recreation Programs and Community Facilities

The Community Services Department provides City-run programs, community centers and public facilities, and social services for Vacaville residents. Vacaville has two community centers, a sports center, and a performing arts theater. According to the Acting Director, the department recovers 85 percent of its expenses through program fees, grants, and other revenue sources[13]. Programs, such as aquatics, gymnastics, and adult sports, are fully covered by fees. Proceeds from a local bond measure provide some funding for the performing arts center. Fees cover 50 percent of funding for facilities maintenance, and 15 percent the cost of social services for targeted groups including seniors and teens.

Schools

The future residents of the Project will be served by two school districts. Vacaville Unified School District, which will serve the homes east of Leisure Town Road, and Travis School District, which will serve the portion of the Project west of Leisure Town Road. According to the Vacaville Comprehensive Annexation Plan 2001-2015, it is anticipated that new residential developments will produce 0.727 students per dwelling unit.

Both the Vacaville and Travis School Districts were contacted for comment during the preparation of the DEIR. The Vacaville Unified School District indicated that the Project, as proposed, will generate 94 additional K-6 students, thirty 7th – 8th grade students, and fifty one 9th-12th grade students for the Vacaville schools. This total represents students generated by residential development east of Leisure Town Road, which would be accommodated by the Vacaville schools.

Regulatory Setting

Local government services are under the regulatory authority of the City of Vacaville. Various departments within the local government oversee planning and operations of the various services. Departments with oversight include the Public Works Department, Police Department, Fire Department, Parks and Recreation Department, and others. Schools affected by the Project are under the jurisdiction of the two aforementioned school districts, the Vacaville USD and Travis USD.

Methodology

Impacts to public services are assessed according to the incremental impact that the development will have on the ability of the provider to meet service demands and desired levels of service. These demands and levels of service are set by the governing body of the agency providing the service.

Thresholds of Significance

Impacts would be considered significant if the Project would:

Fire Services

The impact on fire protection services is considered significant if the proposed project:

1. Exceeds the service capacity of existing or planned fire protection services and facilities;
2. Will not provide adequate fire flow to serve any proposed or anticipated improvements; or
3. Is not consistent with Vacaville General Plan or Zoning requirements for fire access.

Law Enforcement Services

Project impacts on police protection services are considered significant if the proposed project will require services that exceed adopted service standards or response times.

Park and Recreation Services

Impacts on park and recreation services are considered significant if the project will result in the generation of demand for park services that exceed the short- or long-term capacity of the existing or planned facilities, and if parkland dedication or in-lieu fees will not offset project-related costs for providing additional facilities and services. Vacaville Department of Parks and Recreation standards shall be used to determine suitable levels of service for anticipated demand.

School Services

The impacts on school services is considered significant if the project will result in generation of students and demands for school services which exceed the short or long-term capacity of school facilities, and if normal school district financing sources cannot offset project-related costs for providing additional facilities and services.

Environmental Impact and Mitigation Measures

Impact PS-1: Demand for Additional Fire Services

The fiscal impact analysis conducted as part of this EIR (see Appendix I) assessed the increase in demand associated with the development of the Project. This demand was based on existing services and infrastructure, as well as optimum response times and future needs set forth in the City's "Standards of Response Cover Study." The Fire Department has determined that an additional fire station will be required to meet desired response times. This station will be constructed in the first phase of the Project, with three firefighters staffing the station at opening, increasing to five full-time firefighters at the buildout of the Project.

Operational costs associated with the new fire station are estimated at $1.3 million in 2006, increasing to $3.3 million at Project buildout in 2015. According to information provided by the City, the Project applicant has agreed to pay all costs associated with increased demand for fire services resulting from the Project. With costs of upgrading services to meet increased demand covered by the applicant, the impact to fire services will be **less than significant**.

Impact PS-2: Ability to Meet Minimum Fire Flow Requirements

A critical component of fire safety is the ability of the City to maintain sufficient water pressure to allow firefighters to effectively combat fires. Minimum water pressure standards have been adopted and are required prior to approval of improvement plans for new developments. For a full description and analysis of water supply and demand issues, refer to Section 3.10 of the DEIR.

The analysis contained in the water supply assessment (see Appendix E) for the Project indicates that there will be sufficient water supplies available to serve the Project. Current requirements for design and installation of water infrastructure are suitable to ensure that water lines will be able to maintain adequate fire flow pressure, given suitable water supply. The impact is **less than significant**.

Impact PS-3: Demand for Additional Police Services

Impacts on police services were quantified in the Fiscal Impact Analysis conducted as part of the EIR preparation. The full report is located in Appendix I. The Project is estimated to increase the call volume of the Department by three to five percent, increasing at different phases. The Police Chief has indicated that the Department will require additional officers in the first phases of development. Based on average costs of the City for sworn police officers, the estimated cost of providing police services to the Project site will be $383,600 in 2006, increasing to $1,212,100 per year at Project buildout.

According to information provided by the City, the Project applicant has agreed to pay all costs associated with increased demand for police services resulting from the Project. With costs of upgrading services to meet increased demand covered by the applicant, the impact to police services will be **less than significant**.

Impact PS-4: Potential Impact on School Facilities

The impacts of development on school services in the State of California led to Assembly Bill 2926 in 1986, which authorized school districts to levy developer fees. The Leroy F. Greene School Facilities Act of 1998 (SB 50) set caps on fees that school districts can levy against residential projects, and sets the CEQA standard for full and complete school facilities mitigation. Codified as Section 65995 of the Public Resources Code, this law states that a project developer can only be required to pay the adopted school impact mitigation fee of a jurisdiction, with no additional financial or regulatory requirements to mitigate impacts on schools. The maximum fees for residential and non-residential development continue to be set by the State, and are adjusted every two years for inflation.

Payment of adopted school fees is sufficient to mitigate impacts of residential and commercial development on the Vacaville and Travis school districts. Impacts related to the land use development components of the project are **less than significant**.

Impact PS-5: Demand for Additional Parks Services

The Project will add more than 1,400 new residential units to the city, adding an estimated 3,500 to 4,500 new persons. The City has adopted a standard of providing 3.34 acres of parkland per 1,000 residents. Based on this standard, the Project would need to provide at least 15.03 acres of parkland to mitigate impacts associated with the population increase. The project proposal includes provisions for the development and maintenance of approximately 27 acres of parkland, or approximately six acres of parks per 1,000 persons. The demand for new parks beyond those proposed in the Project is **less than significant**.

Fiscal impacts on parks were quantified in the Fiscal Impact Analysis conducted as part of the EIR preparation. The full report is located in Appendix I. The Project, as proposed, includes 27 acres of land to be developed as publicly owned parks, to be operated and maintained by the City of Vacaville. The majority of construction and maintenance costs are to be paid by the developer and future residents of the development, through the establishment of a lighting and landscape district. Projected maintenance costs likely to be incurred by the City's General Fund, including staffing costs, are $32,668 over the development of the Project. According to information provided by the City, the Project applicant has agreed to pay all costs associated with development, operation, and maintenance of the proposed parks. With projected costs covered by the applicant, the fiscal impact to the Vacaville Parks Department will be **less than significant**.

Impact PS-6: Demand for Additional Roads and Roadway Maintenance

Impacts on roads and roadway maintenance were quantified in the Fiscal Impact Analysis conducted as part of the EIR preparation. The full report is located in Appendix I. The Project is estimated to require the construction of 11 centerline miles of roadways, including three new traffic signals. Costs associated with construction, operation, and maintenance of these roads and signals is estimated at $120,200 in 2006, increasing to $172,800 annually at buildout.

According to information provided by the City, the Project applicant has agreed to pay all costs associated with roadway and signal construction, operation, and maintenance. With costs of upgrading roads and signals covered by the applicant, the impact of increased demands for roads and roadway services will be **less than significant**.

Impact PS-7: Impacts to General Government Services

Impacts on general government services were quantified in the Fiscal Impact Analysis conducted as part of the EIR preparation. The full report is located in Appendix I. The Project is estimated to impact a variety of general services, including the City Council and Treasurer, City Attorney, City Manager's Office, Department of Housing and Redevelopment, Administrative Services, and Non-Departmental.

The basis for analysis of costs to general government services are taken from the city's General Fund adopted budget. Determination of significance for this impact is based on the ability of the Project to increase revenues to the General Fund sufficiently to offset costs of the general governmental services. Such an assessment was made in the Fiscal Impact report.

The report indicates that the Project will have a negative effect on the General Fund in the first years (2006-2007) of the Project's construction and operation. A surplus begins in 2008, and continues to increase through 2015. Overall, the Project is estimated to produce a net positive impact on the General Fund between the inception (2006) and completion (2015) of the Project. The impact is therefore considered **less than significant**.

Notes and References

[1] http://www.ci.vacaville.ca.us/departments/fire/about/field_operations.php
[2] Personal communication with Chief Brick, June 24, 2003.
[3] City of Vacaville Proposed Operating Budget, FY 2001-2003.
[4] Personal communication with Chief Harrison, June 24, 2003.
[5] Ibid.
[6] City of Vacaville Proposed Operating Budget, FY 2001-2003.
[7] Ibid.
[8] Personal communication with Chief Harrison, June 24, 2003.
[9] Vacaville Vision 2025, May 2001.
[10] Ibid.
[11] City of Vacaville Proposed Operating Budget, FY 2001-2003.
[12] Personal communication with Dale Pfeiffer, Director of Public Works, June 24, 2003.
[13] Personal communication with Acting Director Walker, June 23, 2003.

3.10 Public Utilities

Public Utilities addressed within this section of the EIR include water, sewer, solid waste, gas and electric services. A variety of agencies provide these public services to residents of Vacaville, services that will be required by the future residents, businesses, and other land uses within the proposed planned development. This section addresses the potential impacts on the ability of these agencies to provide needed public utilities, as well as potential environmental impacts of facility or service expansions required to serve the project. An in-depth analysis of surface hydrology and storm drain issues has been included within Section 3.12 Surface Hydrology of this EIR. Other public services, including police, fire, schools, and other governmental services, are addressed in Section 3.9 Public Services. Market feasibility and fiscal impact reports are included as Appendix I to this DEIR.

Environmental Setting

Water Supply

This section contains a description of the existing and planned groundwater, surface water, and water conveyance facilities. The water utility system is a self-supporting City enterprise. The water utility is responsible for operation, maintenance, and repair of the City's water treatment and distribution system, as well as water quality and recycled water distribution. Vacaville's water utility system was purchased from Pacific Gas and Electric (PG&E) Company in 1959 by issuing voter-approved water revenue bonds. Since purchasing the system, the City has systematically improved and upgraded this infrastructure.

The Vacaville water system consists of surface water treatment facilities, wells, pumping facilities, distribution and transmission pipelines, and storage reservoirs. The system receives water from several sources, including Solano Project water from the Lake Berryessa reservoir through the North Bay Regional (NBR) Water Treatment Plant (WTP) and the diatomaceous earth (DE) Water Treatment Plant (WTP), State Water Project water from the North Bay Aqueduct (through the NBR Plant), and ground water from local City wells. Within Vacaville's water entitlements, the percentage of water used from each supply source varies due to conjunctive use. If any one source has limited water availability or poor water quality, use from other sources can increase. Likewise, if unscheduled water becomes available, it can be utilized to the City's advantage.

Surface water from Lake Berryessa is provided by contract between the U.S. Bureau of Reclamation (BuRec) and the Solano County Water Agency (SCWA), delivered by the Solano Irrigation District (SID). This water is treated at either the NBR WTP or at the City's 10 million gallons per day (mgd) diatomaceous earth (DE) filter water treatment plant (WTP), in which the treated water flows into a ground-level chlorine contact basin.

Wells 1, 6, and 13 also supply water directly to this contact basin. From the contact basin, a booster pump station (Treated Water Pump Station) lifts the water into the distribution system. The remaining wells (2, 3, 5, 7, 8, 9, and 14) supply water directly to the distribution system. A new

production well (15), now drilled, will be equipped and brought on-line in 2004. In addition, a low-capacity well, the De Mello Well, was brought on line in March 2003 to provide fresh water at a distribution system "dead-end" located on the outskirts of town. The locations of the existing City wells and DE WTP are shown in Figure 3.10-1.

The NBR WTP provides a capacity of 13.3 mgd for Vacaville and supplies water directly to the City's distribution system. The NBR WTP draws water from the Sacramento River Delta via the NBA, as well as Solano Project water from the Putah South Canal. The location of the NBA and Putah South Canal can be seen in Figure 3.10-2.

Surface Water Transmission Facilities and Entitlements

The City has available three separate entitlements for surface water. Each entitlement has a different level of seniority. This section describes the locations and sources of the City's entitlements to surface water.

Solano Project/SID Agreement

The Solano Project was constructed by the United States Bureau of Reclamation (BuRec) in 1958. The Solano Project is not part of the Federal Central Valley Project, but the BuRec is the owner of the facility and holds the water rights. Unlike most federal water projects, the water rights to the Solano Project "belong" to the Solano water users. The main feature of the Solano Project is Monticello Dam, which provides for storage of 1.6 million ac-ft of water in Lake Berryessa (Lake). Water from the Lake is diverted through the Solano Diversion Dam to the 32-mile Putah South Canal, which transports water to the eight SCWA-member unit contractors for Solano Project water.

SCWA has entered into agreements with cities, districts, and State agencies to provide water from the Solano Project. The Solano Project contracting agencies are: Fairfield, Suisun City, Vacaville, Vallejo, SID, Maine Prairie Water District, University of California at Davis, and California State Prison-Solano. The annual entitlement for each agency is listed in Table 3.10-1.

The contracts with the public entities that use Solano Project water provide for the sale and distribution of water made available by the BuRec each year. The BuRec is contractually committed to delivering the full contract amount of water supply from the Solano Project unless the water supply does not physically exist (e.g., an empty reservoir). All Solano Project contractors, whether they are municipal or agricultural, are impacted by water supply reductions on an equal basis.

In a 1995 Master Water Agreement with SID, Vacaville received an increasing supply from SID through the year 2016 and constant supply thereafter until the year 2045. A summary of the annual water schedule of SID water available to Vacaville is contained in Table 3.10-2.

The Solano Project has an annual firm yield of 207,350 acre feet per year. Firm yield is defined as the amount of water available every year during the driest hydrologic period on record. This is a conservative method of determining a water supply from a reservoir and results in a very dependable water supply.

The Solano Project differs from other reservoir projects because of the size of the dam relative to the size of the watershed and the source stream. The reservoir has a large capacity which means

that it may take a relatively long time to deplete the supply but, in turn, it takes a relatively long time to fill the reservoir as well. Long-term reliability for the Solano Project is good because the sole contractor is Solano County Water Agency and all physical facilities are completely constructed.

Vacaville anticipates receiving 100 percent of their 5,750 acre feet per year entitlement as well as 100 percent of their SID agreement entitlement, which will mature to 10,050 acre feet per year in 2016 and continue until 2045 during normal and single dry years. During multiple dry years, the City anticipates receiving 95 percent of the entitlements.

Table 3.10-1
Summary of Solano Project Water Contracts

Agency	Annual Entitlement (ac-ft/yr)
Fairfield	9,200
Suisun City	1,600
Vacaville	5,750
Vallejo	14,600
SID	141,000
Main Prairie Water District	15,000
UC Davis	4,000
California State Prison - Solano	1,200
Project Operation Loss (average estimated)	15,000
Total	207,350
Solano County Water Agency, *SCWA Briefing Book*, January 2002.	

Table 3.10-2
Annual Water Schedule for the SID Water Agreement

Year	Annual Entitlement (ac-ft/yr)		Year	Annual Entitlement (ac-ft/yr)
2001	2,500		2009	3,000
2002	2,500		2010	8,000
2003	2,500		2011	8,000
2004	2,500		2012	9,000
2005	3,000		2013	9,000
2006	3,000		2014	10,000
2007	3,000		2015	10,000
2008	3,000		2016 through 2045	10,050
Nolte Associates, Inc., *2000 Urban Water Management Plan Update*, December 2001.				

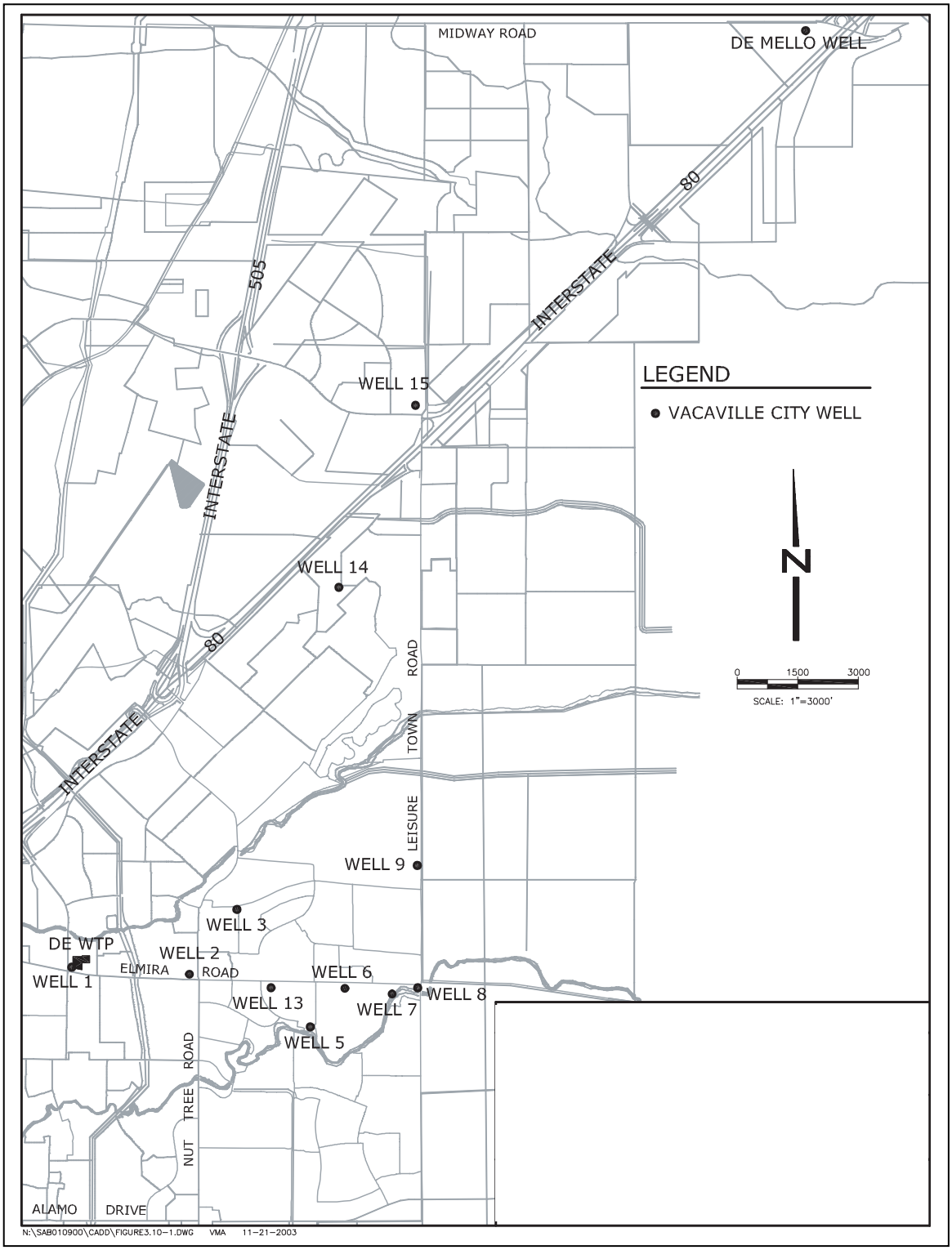


Figure 3.10-1
Municipal Wells and DE WTP

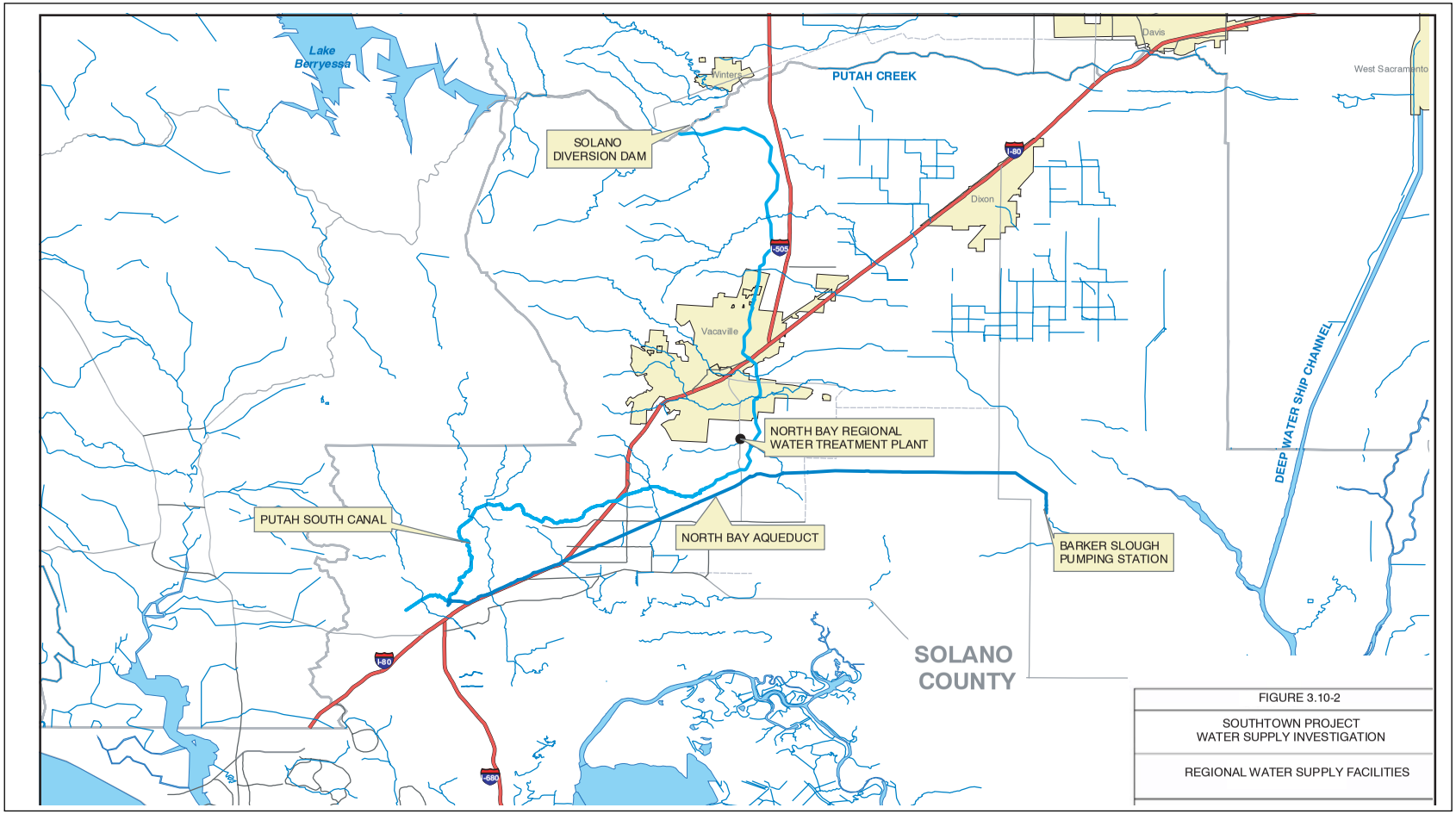


Figure 3.10-2
Regional Water Supply Facilities

State Water Project

Another source of surface water available to Vacaville is the North Bay Aqueduct (NBA), part of the State Water Project. Through the SCWA and the NBA, Vacaville receives an entitlement from the State Water Project and water from a Year 2000 entitlement purchase from Kern County Water Agency (KCWA). The City entitlement from the State Water Project is 6,100 ac-ft/yr, while KCWA Agreement water totals 2,878 ac-ft/yr. The Solano County branch of the NBA was completed in 1988. The North Bay Aqueduct is 28 miles long starting from Barker Slough in the Delta and ending in Napa County. The location of the NBA can be seen in Figure 3.10-2. The California Department of Water Resources (DWR) is the owner and operator of the NBA.

The water supply for the NBA is less reliable than the Solano Project. Entitlements from the NBA and KCWA come from the State Water Project which provides water to a total of 29 contractors. Because the NBA is part of the entire State Water Project, any shortages occurring in the State Water Project impact the NBA. The State Water Project has a formula for sharing shortages between member contractors that gives a preference to municipal and industrial contractors. Because the SCWA uses NBA water solely for municipal and industrial purposes, SCWA enjoys higher priority than some other State Water Project contractors. However, during dry years, shortages can be expected and contract water amounts reduced from the NBA.

There are currently seven agencies with NBA water entitlements including Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo. The water entitlement amounts in each agency contract for State Water Project water increase annually somewhat in proportion to the SCWA's contract with DWR. Member units using the NBA and their entitlements are described in Table 3.10-3. Shortages during dry years can be expected to be proportional to their share of the overall contract with DWR.

Table 3.10-3
State Water Project
Allocation to Solano County Cities Served by the North Bay Aqueduct

City	Annual Entitlement (ac-ft/yr)
Benicia	7,200
Dixon	0
Fairfield	14,678
Rio Vista	0
Suisun City	1,300
Vacaville	8,978
Vallejo	5,600
Total	47,756

Solano County Water Agency, *SCWA Briefing Book*, January 2002.

DWR Agreement/Settlement Water

Settlement water consists of unappropriated surface water from the Sacramento River and Sacramento-San Joaquin Delta Estuary. It is water that is not needed to satisfy existing senior water

rights or to maintain water quality in accordance with existing applicable water quality standards. Settlement water is also not currently appropriated to the State Water Project or the Central Valley Project over which the City has priority. The DWR agreement includes the cities of Fairfield, Benicia, and Vacaville. The entitlements for the three cities for settlement water are shown in Table 3.10-4 and are based on critical dry year deliveries.

Supply from the North Bay Aqueduct, including the Kern County Water Agency agreement water, originates from the State Water Project and has a similar level of priority as all the other 28 contractors to the project. As a result, this source is subject to significant cut backs during dry years. The City anticipates as little as 40 percent availability during a single dry year and 50 percent availability during multiple dry years for this water supply resource.

Settlement Water

The settlement water rights for water out of the Sacramento River watershed are based on winter, dry year conditions. As a result, the City anticipates receiving 100 percent of the entitlement during normal, single dry, and multiple dry years.

Table 3.10-4
Summary of Settlement Water for the Cities of Fairfield, Benicia, and Vacaville

City	Annual Entitlement (ac-ft/yr)
Fairfield	11,800
Benicia	10,500
Vacaville	9,320
Total	31,620
Solano County Water Agency, *SCWA Briefing Book*, January 2002.	

Groundwater Supply

Another source of supply for the City is groundwater. Groundwater is provided through 11 wells withdrawing water from the deep aquifer in the basal zone of the Tehama Formation. Historic groundwater pumping is summarized in Table 3.10-5. Most City wells are located in the Elmira well field. However, new wells are being sited further north, near Interstate 80 (I-80). Currently, approximately 6,000 ac-ft/yr are withdrawn. Vacaville continues to explore well field expansion as a means of maintaining adequate water supply.

For the purposes of the Water Supply Assessment, an analysis of the reliability of groundwater as a water supply resource was conducted. Table 3.10-6 indicates anticipated groundwater extraction by Vacaville for the next 25 years during normal year, single dry year, and multiple dry years. The groundwater analysis, in its entirety, is found in Appendix E of this EIR.

Table 3.10-5
Historic Groundwater Pumping for the City of Vacaville

Year	(ac-ft/yr)		Year	(ac-ft/yr)
1968	2,862		1985	5,853
1969	3,046		1986	5,829
1970	2,871		1987	6,267
1971	3,198		1988	5,420
1972	3,255		1989	6,073
1973	3,125		1990	5,626
1974	3,316		1991	5,447
1975	3,970		1992	5,531
1976	4,965		1993	4,395
1977	5,076		1994	3,892
1978	5,707		1995	3,885
1979	6,236		1996	3,230
1980	7,043		1997	3,386
1981	7,740		1998	3,905
1982	7,684		1999	4,096
1983	8,156		2000	5,141
1984	6,063		2001	6,211

Nolte Associates, Inc., *City of Vacaville 2000 Annual Water Report*, August 2003.

Table 3.10-6
Projected Groundwater Extraction (AF/YR)

Year	Normal Year	Single Dry Year	Multiple Dry Years
2005	7,000	8,400	7,700
2010	7,500	9,000	9,000
2015	7,500	9,000	9,000
2020	8,000	9,600	9,600
2025	8,000	9,600	9,600

Source: SB 610 Water Supply Assessment, September 2003

Travis Air Force Base maintains a well field within the golf course property located east of the Project site that provides up to 50 percent of the Base water supply at various times. The City is implementing a regional program of monitoring groundwater data to insure against overdraft or contamination. As part of this effort, it was determined that the City of Vacaville would not significantly impact the groundwater basin with construction of new production wells. The City's well field is located along Elmira Road, west of Leisure Town Road, excluding new production wells currently under construction north of Interstate 80. The nearest potential production well to the Travis AFB Well Field would be located at the intersection of Alamo Drive and Leisure Town Road.

Recycled Water

In 2003, the City began developing a Recycled Water Master Plan. Preliminary planning estimates indicate tertiary treated water could be available for delivery, given the installation of appropriate infrastructure, by 2015. Potential irrigation customers have been identified and a stakeholders workshop was held in July of 2003 to review preliminary planning with affected community members. At present, delivery estimates for 2015 total 1,175 ac-ft/yr. Knowing that this "drought proof" resource will require user contracts and possible retrofit costs on the user's behalf, 75 percent of the total delivery figure (880 acre feet per year) is assumed for the purposes of this environmental analysis.

The City's recycled water master planning efforts indicate that there are 1,175 acre feet of water available per year by the year 2015. Given requirements for user contracts and retrofit costs, only 75 percent of the total delivery estimate will be available and utilized in 2015.

Total Water Supply Availability

Tables 3.10-7, 3.10-8, and 3.10-9 summarize the City's anticipated water deliveries for the next 25 years during normal, single dry, and multiple dry water years.

Table 3.10-7
Anticipated Water Supply for Normal Year (AF/YR)

Sources of Supply	Year				
	2005	2010	2015	2020	2025
Solano Project	8,750	13,750	15,750	15,800	15,800
Vacaville Entitlement	5,750	5,750	5,750	5,750	5,750
SID Agreement	3,000	8,000	10,000	10,050	10,050
State Water Project	17,310	17,310	17,310	17,310	17,310
Vacaville Entitlement	6,100	6,100	6,100	6,100	6,100
KCWA Agreement	2,878	2,878	2,878	2,878	2,878
Settlement Water	9,320	9,320	9,320	9,320	9,320
Groundwater	7,000	7,500	7,500	8,000	8,000
Recycled Water	--	--	880	880	880
Total	34,048	39,548	42,428	42,978	42,978

Source: SB 610 Water Supply Assessment, September 2003

Table 3.10-8
Anticipated Water Supply for Single Dry Year (AF/YR)

Sources of Supply	Year				
	2005	2010	2015	2020	2025
Solano Project	8,750	13,750	15,750	15,800	15,800
Vacaville Entitlement	5,750	5,750	5,750	5,750	5,750
SID Agreement	3,000	8,000	10,000	10,050	10,050
State Water Project	15,066	15,066	15,066	15,066	15,066
Vacaville Entitlement	3,904	3,904	3,904	3,904	3,904
KCWA Agreement	1,842	1,842	1,842	1,842	1,842
Settlement Water	9,320	9,320	9,320	9,320	9,320
Groundwater	8,400	9,000	9,000	9,600	9,600
Recycled Water	--	--	880	880	880
Total	32,216	37,816	40,696	41,346	41,346

Source: SB 610 Water Supply Assessment, September 2003

Table 3.10-9
Anticipated Water Supply for Multiple Dry Years (AF/YR)

Sources of Supply	Year				
	2005	2010	2015	2020	2025
Solano Project	8,313	13,063	14,963	15,011	15,011
Vacaville Entitlement	5,463	5,463	5,463	5,463	5,463
SID Agreement	2,850	7,600	9,500	9,548	9,548
State Water Project	13,540	13,540	13,540	13,540	13,540
Vacaville Entitlement	2,867	2,867	2,867	2,867	2,867
KCWA Agreement	1,353	1,353	1,353	1,353	1,353
Settlement Water	9,320	9,320	9,320	9,320	9,320
Groundwater	7,700	7,700	7,700	8,000	8,000
Recycled Water	--	--	880	880	880
Total	29,553	35,603	38,383	39,031	39,031

Source: SB 610 Water Supply Assessment, September 2003

Potable Water Production Facilities

Potable water production facilities include wells and surface water treatment plants (see Figure 3.10-1). A summary of the water production facilities available to the City is presented in Table 3.10-10. As noted earlier, the City participates in two water treatment facilities: (1) the DE WTP; and, (2) the NBR WTP. The City owns 11 municipal groundwater wells generally located along the Elmira Road corridor, east of I-80 and west of Leisure Town Road. Water from Wells 1, 6, and 13 are chlorinated at the DE WTP and then pumped to the City distribution system. The remaining wells (2, 3, 5, 7, 8, 9, and 14) supply water directly to the distribution system. A low capacity well (0.22 mgd) located at the intersection of Midway Road and I-80, the De Mello Well, was brought on line in March

2003 to provide fresh water at a distribution system "dead-end" located on the outskirts of town. The well was designed to provide re-circulation and improve water quality at the existing water main in the area (currently a long dead-end water main from Leisure Town Road).

The City has plans to replace or rehabilitate existing wells and to construct three new wells in the near future to more fully develop the groundwater supply. A new well (Well 15), located near the intersection of Vaca Valley Parkway and Leisure Town Road, is expected to be in service in 2004. Similar plans are underway for Wells 16 and 17.

Potable Water Distribution System Facilities

The City's potable water distribution system consists of one main pressure zone (main zone) plus several higher elevation pressure zones (upper pressure zones) in various areas of the City. The main pressure zone serves elevations between 122 and 222 feet. All of the water production facilities are located within the main zone. The main zone currently has four water storage reservoirs with a combined capacity of 13.8 million gallons (MG).

The nearest reservoirs to the Southtown project are the Butcher Road Reservoirs, part of the City's main pressure zone. The City's reservoir locations and upper pressure zones are illustrated in Figure 3.10-3. Reservoirs are required to provide operational, fire, and emergency storage. The water mains in the existing water distribution system form a network throughout the City. Large-diameter water mains form the backbone of the system and convey water from production facilities to the major sectors of the City. The largest water mains are 30 inches in size. One 30-inch water main originates at the NBR WTP and follows Peabody Road northward to Elmira Road. At Elmira Road, this water main joins with another 30 inch water main that ties into the DE WTP. The next largest water main is a 24-inch water main that originates at the intersection of Peabody Road and Elmira Road and extends north on Browns Valley Road to provide service to the northern sectors of the City. The 24-inch water main extends from Browns Valley Road to Vaca Valley Parkway. Elsewhere, the distribution system has several 18-inch water mains and many 12-inch and smaller water mains. Existing water mains in the vicinity of the Southtown project are shown in Figure 3.10-4.

Figure 3.10-6 presents planned water distribution system facilities in the vicinity of the proposed Southtown project. The proposed improvements were identified previously in the Water System Master Plan and the City's Development Impact Fee Study. A description of each of the scheduled improvements depicted in Figure 3.10-6 is provided below.

- **DIF 88 – Southeast Pipeline:** An 18-inch pipeline is proposed to extend from Peabody Road around the southeast perimeter of the City boundaries and north along Leisure Town Road to Elmira Road. This pipeline is scheduled for construction in 2005.

- **DIF 60 – Peabody Road Pipeline**: When the City's allocation in the NBR WTP increases beyond 13.33 mgd, a parallel pipeline from the NBR WTP is proposed from the plant to California Drive. The pipeline will include 36-inch and 30-inch segments parallel to the existing 30-inch and 24-inch pipeline from the NBR WTP.

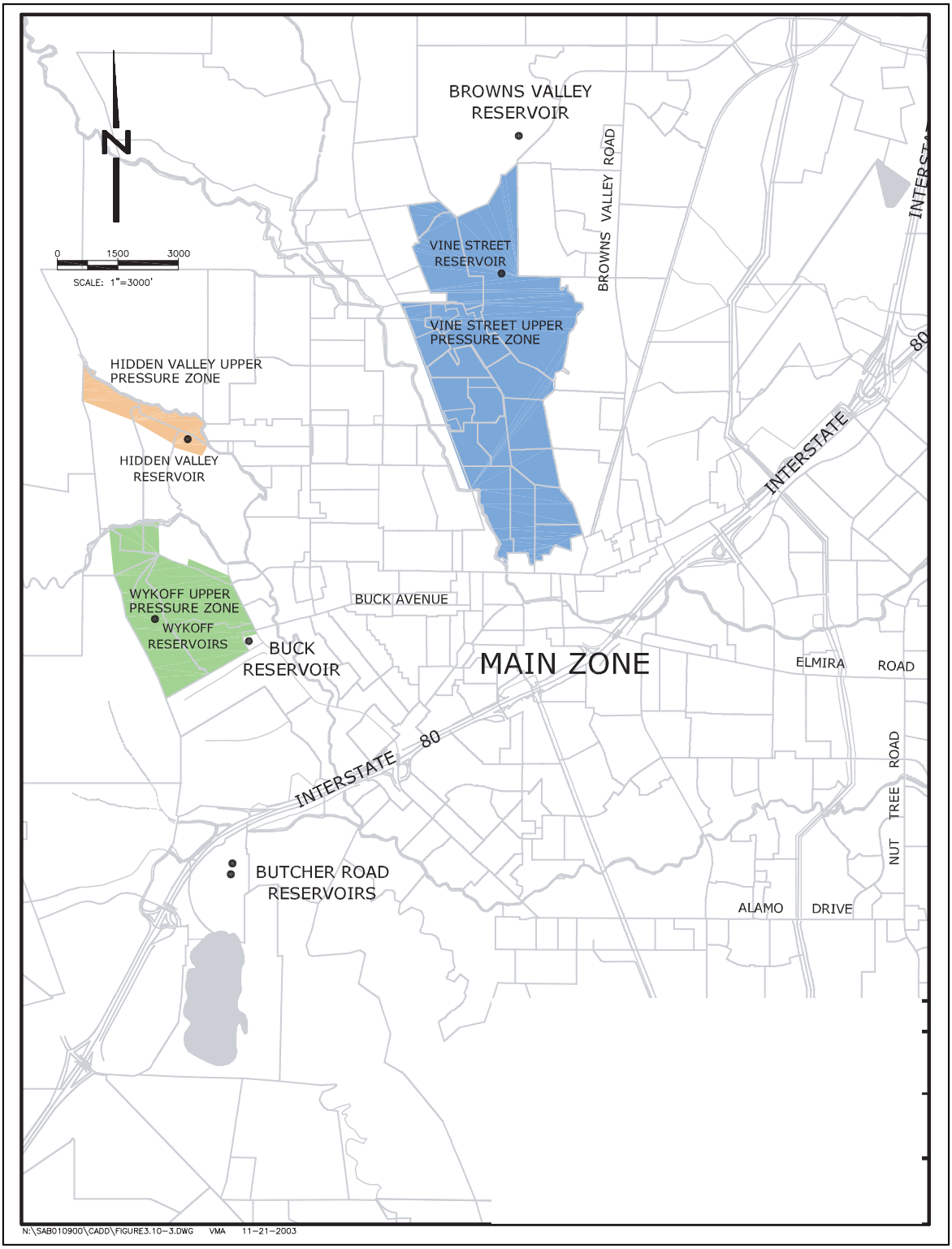


Figure 3.10-3
Existing Pressure Zones and Reservoirs

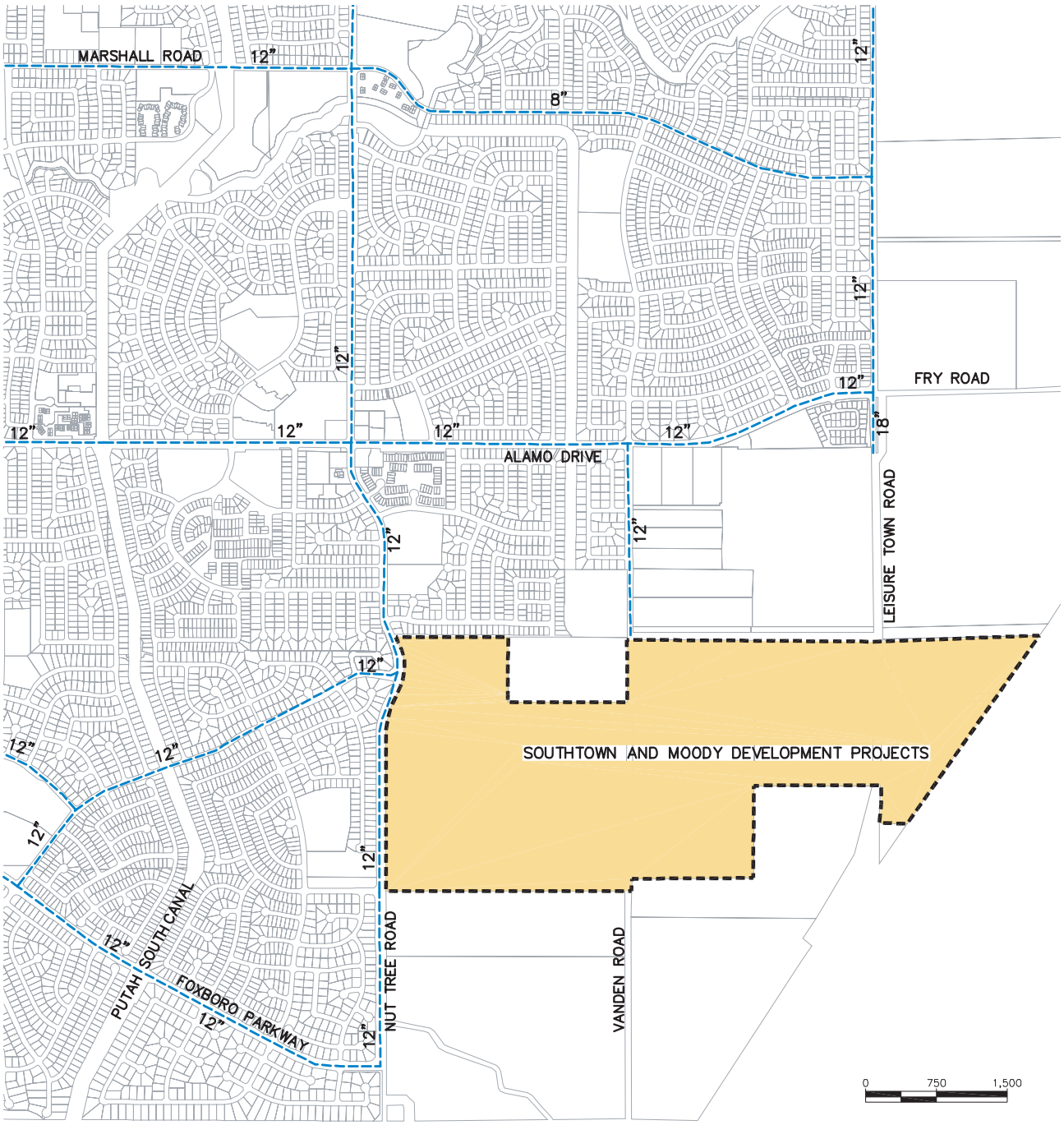

MARSHALL ROAD
12"
8"
12"
12"
12

Table 3.10-10
City of Vacaville Summary of Water Production Facilities

Production Facility	Capacity (mgd)
Existing Potable Water Wells	
Well 1	0.33
Well 2	1.58
Well 3	2.20
Well 5	1.87
Well 6	1.64
Well 7	1.60
Well 8	2.20
Well 9	2.02
Well 13	2.00
Well 14	2.50
De Mello Well	0.22
Subtotal - Existing Wells	18.16
Future Potable Water Wells	
Well 15 (expected on-line in 2004)	2.50
Well 16 (expected on-line in 2005)	2.50
Well 17 (expected on-line in 2007)	2.50
Well 18 (expected on-line in 2009)	2.50
Well 19 (expected on-line in 2012)	2.50
Well 20 (expected on-line in 2016)	2.50
Well 21 (expected on-line in 2020)	2.50
Subtotal – Future Wells	17.50
Existing Water Treatment Plants	
DE Plant	10.00
NBR Plant (City of Vacaville Allocation)	13.33
Subtotal – Existing WTP	23.33
Future Water Treatment Plants	
NBR WTP future allocation	16.67
Subtotal – Future WTP	16.67
Total Water Production Capacity	75.66
City of Vacaville	

Non-Potable Water Distribution System Facilities

Currently, SID provides non-potable water service to various agricultural parcels within the proposed Southtown project area. The existing non-potable water distribution system consists of a reinforced concrete pipe from the Dally Highline Canal to an open channel conveyance facility that traverses the entire project area in the north. A schematic representation of the existing non-potable water distribution system facilities within the Southtown project are presented in Figure 3.10-5.

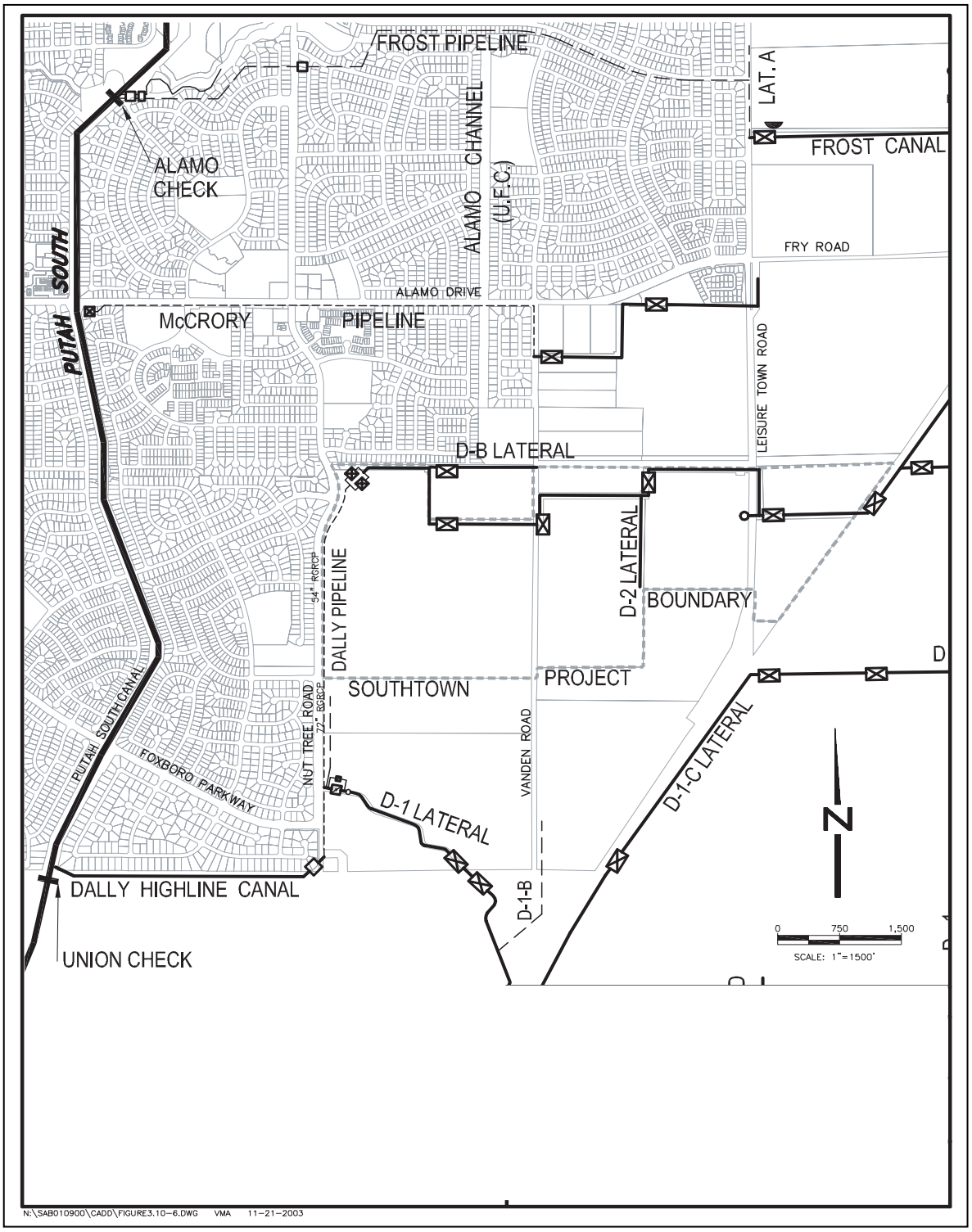


Figure 3.10-5
Non-Potable Water System near Southtown Project

The city does not have any planned non-potable water system facilities near the vicinity of the proposed Southtown project. However, the project area will be added to the existing SID service area to help the City reduce total water demands. As a minimum, the non-potable water distribution system will consist of a connection at the Dally Highline Canal with a booster pump station and distribution system capable of conveying comparable flows as currently delivered to the various agricultural parcels in the service area.

Sewer

Wastewater Collection System

The Southtown Project site is located within an area planned for sewer service via the City of Vacaville's wastewater collection system. The City's sewer utility is responsible for the routine operation, maintenance, and repair of the sewer infrastructure. The wastewater collection system includes gravity mains that utilize Vacaville's natural west to east slope, pressurized (force) mains, lift stations, and two wastewater treatment plants. The City's sewer utility performs ongoing flow metering to monitor flows in major trunk sewers, including those in the Project vicinity and also periodically performs updated modeling and master planning of the entire sewer collection system. These activities permit orderly planning of collection system upgrades necessary to accommodate growth and help the City to identify excessive infiltration and inflow sources so pipeline and treatment capacity can be preserved. Major sewer infrastructure projects that will serve the Project area and other areas of Vacaville are planned for funding under the Development Impact Fee (DIF) program. The funding source for major sewer infrastructure projects is connection fees paid by new development, and for some projects, sewer operation and maintenance charges or other project-specific funding mechanisms.

A portion of the Southtown Project site is located within the designated service area for the CSP-S Trunk Sewer. The CSP-S Trunk Sewer currently traverses the Project site. The City entered into a Joint Powers Agreement in June of 2000 with the California Department of Corrections (CDC) that updated the terms of funding the original construction of the CSP-S Trunk Sewer and reserved 2.14 million gallons per day (MGD) of capacity within the sewer for use by the CDC. The remaining capacity available to the City can accommodate a portion of the Project, but is inadequate to accommodate the entire Project without additional improvements[1]. There are also other trunk sewers in the project vicinity. There are currently no sewer mains or laterals connected to the CSP-S Trunk Sewer in the general Project area.

Wastewater Treatment

The CSP-S Trunk Sewer conveys existing wastewater flows to the Easterly Wastewater Treatment Plant (Easterly WWTP), located immediately southeast of the town of Elmira and northeast of the Project site. The Easterly WWTP provides secondary treatment of wastewater and was designed with an average flow capacity of 10 MGD. The facility treats nearly all wastewater generated by municipal users within Vacaville. Treated effluent is discharged to Old Alamo Creek, which is a tributary to the Sacramento-San Joaquin Delta. Waste solids are beneficially reused either as alternative daily cover at a private nearby landfill, or applied as a soil amendment on City-owned agricultural lands. An expansion of the Easterly WWTP to a secondary treatment capacity of 15 MGD is currently under construction, with an anticipated completion date in 2004.

The Easterly WWTP is operated under a National Pollutant Discharge Elimination System (NPDES) permit issued by the California Regional Water Quality Control Board – Central Valley Region (RWQCB). The permit, which is reissued every five years, specifies waste discharge and monitoring requirements to protect the water quality of downstream water bodies.

The average dry weather flow (ADWF) capacity specified in the discharge permit for the Easterly WWTP is interpreted as a maximum monthly flow for the period from May through October. There is no permit limit for the annual average flow, so the ADWF is used to define plant capacity. Flow is reported monthly; therefore, the highest average flow for any given dry-weather month (May through October) is used as the measure of current plant flow. Over the past seven years, the flow recorded in May has been the maximum monthly dry weather flow. The average flow in May of 2002 was 7.8 MGD. Higher flows would have been expected due to increased infiltration and inflow in a year with more late spring rainfall, and some growth has occurred since May of 2002. The annual Infrastructure, Facilities and Services Status Report prepared by the City of Vacaville includes an estimate of ADWF with anticipated growth through the end of 2002 and an allowance for wet year flows[2]. Based on that report, the predicted ADWF for existing conditions is 8.7 MGD. Therefore treatment plant flows are currently below the permitted flow capacity of the plant by 1.3 MGD.

Winter wet weather flow is also an important plant and wastewater collection system capacity consideration. Typically, flow in a wastewater collection system is a combination of sanitary sewage and fresh water entering the system as infiltration and inflow. Infiltration and inflow are the result of groundwater entering the collection system from high water tables, leaking pipe joints, or damaged pipes and manholes; rainfall runoff from flooding fields and streets entering manhole tops; and drains improperly connected to the sanitary sewer. Infiltration and inflow can represent a significant portion of the flow in a wastewater collection and treatment system, especially during the rainy season. The capacity of the overall system must be adequate to contain peak sanitary flow plus peak infiltration and inflow. This flow condition is termed "peak wet weather flow" (PWWF).

The existing Easterly WWTP was designed for a daily peak wet weather flow capacity of 27 MGD. Historical peak hour flows have significantly exceeded this amount[2], but the plant has been able to accommodate the higher flows through short-term operational modifications by plant staff using redundant capacity and storage in the influent sewer. The expanded plant currently under construction is designed to provide treatment for an hourly PWWF of 55 MGD.

Historical flows are shown in Table 3.10-11.

Table 3.10-11
Historical Wastewater Flows at Easterly WWTP (mgd) 1985-2002

Year	Maximum Monthly ADWF[1]	Hourly PDWF[2]	Daily PWWF[3]	Hourly PWWF
1985	8.40	15.1		
1986	9.70	17.5		
1987	7.70	13.9		
1988	7.10	12.8		
1989	7.54	13.6		
1990	8.10	14.6		
1991	7.10	12.8		
1992	7.50	13.5		
1993	8.60	15.5		
1994	6.60	11.9		
1995	7.25	13.1	25.4	28.0
1996	7.60	13.7	20.6	33.0
1997	7.24	13.0	23.4	43[4]
1998	7.76	14.0	14.0	41[4]
1999	7.57	13.6	13.6	26.3
2000	7.94	14.3	14.3	28.6
2001	7.99	14.4	12.5	24.3
2002	7.77	14.0	15.3	21.8

1 ADWF = Average dry weather flow (Maximum monthly average flow, May through October). Some historical values are a 6-month average. After 1995, the maximum monthly ADWF has occurred in May.
2 PDWF = Peak dry weather flow (hourly; estimated to be 1.8 x ADWF)
3 PWWF = Peak wet weather flow.
4 Estimated (actual flow exceeded metering capabilities).

Wastewater Quality

As discussed above, the Easterly WWTP is operated under a National Pollutant Discharge Elimination System (NPDES) permit issued by the California Regional Water Quality Control Board – Central Valley Region (RWQCB). The most recent NPDES permit, Order No. 5-01-044 (California Regional Water Quality Control Board, Central Valley Region, 2001), was adopted in May 2001[3]. This new permit imposes unprecedented restrictions on the Easterly WWTP effluent water quality that would require significant levels of treatment that far exceed the capabilities of the expanded treatment plant. The permit also requires the City to control infiltration and inflow of unpolluted rainwater and groundwater into the wastewater collection system to the extent that it adversely affects the conveyance system and the ability to provide adequate treatment.

The City has appealed the permit on the basis that many of the new requirements would provide no discernable benefit, at great cost[4]. The City is obligated to comply with the permit under State and federal law, to the extent that the permit is upheld through this appeal process.

Solid Waste

The Vacaville Sanitary Service (VSS) is under contractual obligation to provide solid waste disposal service to residents, businesses, and industries located within Vacaville's city limits. Non-recyclable refuse is discarded at the Hay Road Landfill, Incorporated, also known as the B&J Landfill, located southeast of the city, in unincorporated Solano County. This facility has a projected closure date of January 2070 and has a permitted capacity of 20,656,000 cubic yards and permitted monthly intake of 2,500 tons. The landfill is comprised of a disposal acreage of 256 acres and a total acreage of 640 acres. Non-recyclable waste accepted at this facility includes agricultural, asbestos, ash, construction, mixed municipal, sludge, and tires. VSS also provides the city with the opportunity to reduce its waste stream through curbside recycling of newspapers, aluminum cans, tin cans, glass bottles, and plastic bottles and jugs. Yard waste is also collected separately from regular, municipal waste.

Utilities

Electric and natural gas service will be provided by Pacific Gas and Electric (PG&E) throughout the entire city. Existing lines in the Project area will be extended into the site to provide service to the proposed land uses. Power poles that exist within the site will be removed. As required by the Vacaville Land Use and Development Code, all utility lines within the Southtown Project will be installed underground.

Regulatory Setting

Water

City of Vacaville Urban Water Management Plan

The Urban Water Management Planning Act was established in 1983 and was most recently amended in 2000. The Act requires urban water suppliers, such as the City of Vacaville, to prepare a management plan of its current and future water sources so as to continue to provide its customers with an adequate and reliable water supply. The Urban Water Management Plan (UWMP) describes the projected uses for all water resources within an agency to meet the goal of managing water supplies for their highest and best uses. The City of Vacaville adopted its latest UWMP in December 2001. Urban Water Management Plans must be updated every five years, and the next update is due in 2006.

Senate Bills (SB) 610 and 221

As of January 1, 2002, cities/counties are required to determine the adequacy of water supply identified for proposed projects. Senate Bill 610 applies to various projects including residential,

commercial, industrial, hotels, and mixed use, as defined in Section 10912 of the California Water Code. Verification of water supply sufficiency is provided through the preparation of a Water Supply Assessment, compiled by the water purveyor or city/county. Senate Bill 221 only applies to a proposed development associated with residential developments of 500 dwelling units or more and requires the preparation of a Water Verification, also provided by the water purveyor or city/county. This legislation prohibits the approval of a project without written confirmation that the water supply will be available prior to completion of project construction. The Project will be required to comply with the provisions of SB 610. Subsequent development of the site will be required to comply with Senate Bill 221, when applicable. A Water Supply Assessment Report (WSAR) has been prepared for Lower Lagoon Valley, Southtown, and Rice McMurtry development project.

Assembly Bill (AB) 3030

In 1992, the Groundwater Management Act was established as part of the California Water Code (Section 10750, et seq.). The Groundwater Management Act was enacted as Assembly Bill (AB) 3030 that authorizes local agencies which provide water to a service area overlying a groundwater basin to adopt and implement a groundwater management plan for that basin. In 1993, the City of Vacaville voted to adopt a resolution to draft a *Groundwater Management Plan*. The purpose of the plan is to help the City of Vacaville maintain a usable and reliable groundwater supply. The *City of Vacaville Groundwater Management Plan* was adopted in February 28, 1995. The plan is currently being updated, however it provides a program of monitoring groundwater levels, production and quality. The plan also includes the development of policies with specific detail on well construction and spacing based on review of geologic and monitoring data. The plan will continue to generate annual reports on the status of groundwater management by the City of Vacaville.

Solid Waste

State law (AB 939) has required a 50 percent reduction in the City's waste stream since 2000. Vacaville has since implemented recycling and diversion programs through curbside recycling programs.

Utilities

The provision of electrical and natural gas services, provided to the Project by Pacific Gas and Electric (PG&E), are regulated by the California Public Utilities Commission and the Federal Energy Regulatory Commission. Projects within areas served by PG&E are not required to obtain any permits or allowances to receive service. The City requires that developers design and construct underground utilities transmission systems to serve their projects. The developer must also coordinate service with PG&E including resolving issues related to the need for easements and actual construction of the facilities. Unless electrical lines exceed a 45,000 kilovolt capacity, they must be constructed underground.

Vacaville General Plan

The City's General Plan contains policies related to utilities and water conservation that would apply to the Southtown Project. The policies include:

Policy 3.5-G 1
Maintain open spaces needed to retain storm water and prevent flooding of urban or agricultural land.

Policy 3.5-I 6
Reserve stream-channel setbacks necessary for flood control.

Policy 5.1-G 1
Assess the adequacy of utilities in existing developed areas, and program any needed improvements to coordinate with providing facilities to serve developing portions of the [General Plan] Planning Area.

Policy 5.1-G 3
Require buffer landscaping and multiple-use, where feasible, of utility sites and rights-of-way to harmonize adjoining uses.

Policy 5.1-I 1
Continue to update the five-year Capital Improvement Plan to provide for the facilities determined to be needed in relation to the City's financial resources and develop a long-range strategic capital development plan consistent with the General Plan.

Policy 5.1-I 5
Replace existing sewer trunk lines with larger sewer trunk lines, as necessary, to serve intensified land use in developed areas.

Policy 5.1-I 8
Ensure that new development provides funding for adequate facilities services.

Policy 5.1-I 12
Do not approve any development that will not, even with identified mitigation measures, maintain standards for water, sewer, police, and fire service, unless there are overriding findings of special circumstances or economic or social benefits and the service standards will be achieved at the time of project occupancy.

Policy 8.4-I 2
Require development proposals to incorporate water-conserving landscape designs.

Policy 8.4-I 3
Continue to implement a water conservation landscape standard, which address the use of drought-tolerant plant materials, for public buildings, park and recreation facilities.

Policy 8.4-I 5
Do not allow development that would adversely affect the City's well field.

Policy 8.4-I 6
Whenever possible, use non-treated water for irrigation in large landscaped areas.

Policy 9.2-G 1
Locate development outside mapped flood-prone area unless mitigation of flood risks is assured.

Policy 9.2-G 2
Continue to develop a comprehensive system of drainage improvements to minimize flood hazards.

Policy 9.2-G 3
The additional runoff caused by development shall be mitigated.

Policy 9.2-I 2
Evaluate storm drain needs for each project in the context of demand and capacity when the drainage area if fully developed. Require onsite detention until upstream reservoirs are constructed and/or other mitigation of the project's impacts on the storm drainage system appropriate to the project's share of cumulative effect is implemented. In the Alamo Creek watershed upstream of Peabody Road, which includes Alamo, Laguna, and Encinosa Creeks, require post-development 10-year and 100-year peak flows to be reduced to 90 percent of predevelopment levels. For the remainder of the study area, for development involving new construction to the creeks, peak flows shall not exceed predevelopment levels for a 10- and 100-year peak flow. *This is required to reduce downstream flood hazard.*

Policy 9.2-I 4
Assure through a Master Drainage Plan and development ordinances that proposed new development adequately provides for development of onsite and downstream offsite mitigation of potential flood hazards and drainage problems and require development fees to fund the required improvements.

Methodology

Water

The technical memorandum, included as Appendix E, prepared for this Project consists of a water supply investigation representing an analysis of the potential impacts of serving the Project on Vacaville's overall water supply and water distribution system. Recommended supply and distribution improvements were identified and computer simulations were conducted using the water distribution system network model.

The Water Supply Assessment was prepared utilizing the City's adopted water demand factors, existing and growth, as approved as part of the Water and Sewer Planning Factors Reconciliation Memorandum. Information regarding the City's existing and projected water entitlements was analyzed in light of the proposed Project as well as additional growth throughout the city.

Sewer

The proposed Project has been compared on the basis of anticipated hourly peak wet weather flows (PWWF) to previous sewer master planning results. Average flows were first estimated based on the City of Vacaville wastewater generation factors used for collection system planning, which include a factor of safety. Peak flows were estimated using a single sanitary flow peaking factor and an inflow and infiltration factor that were developed for the CSP-S Trunk Sewer Service Area Master Plan[1] (Master Plan), which is applicable to the Project area. The comparison of peak flows was used to identify which of the previously planned trunk sewer improvements are needed to accommodate

the Project, and to recalculate the approximate pipe size for those improvements. The analysis included the previously identified existing and planned trunk sewers located in or adjacent to the Project area, but not the internal sewer lines within the Project area that will be required to connect the Project to the trunk sewer system.

Available treatment capacity was assessed based on the projected average dry weather (ADWF) flow from the Project area.

Utilities

Utilities were contacted to ensure that electricity and gas services could be extended to the site in accordance with City standards.

Thresholds of Significance

Impacts would be considered significant if the Project would:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Not have sufficient water supplies available to serve the project from existing entitlements and resources, requiring new or expanded entitlements;
- Result in a determination by a wastewater treatment provider which serves or may serve the project that it lacks adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs;
- Fail to comply with federal, State, and local statues and regulations related to solid waste; or
- Be located in an area unable to be served by electricity and gas utility providers.

Environmental Impact and Mitigation Measures

Impact UTI-1: Require New or Expanded Water Treatment or Distribution Facilities

As seen in Figure 3.10-6, the proposed Southtown Project will connect to the City's existing water system from three water mains that include a 12-inch main in Nut Tree Road, a 12-inch main in Vanden Road, and an 18-inch main in Leisure Town Road. Looping will be constructed in order to maintain the overall reliability of water pressure. Major interties within the Project will be 12-inch diameter pipelines.

Although a formal phasing plan has not yet been established, it is anticipated that development within the Moody portion of the Project site and the proposed apartments on the west side of Leisure Town Road will be constructed first. Looping will be constructed off the 18-inch main in Leisure Town Road. Initial phases of development on the east side of Nut Tree Road will be looped from the 12-inch main in Nut Tree Road. As the Project is built out, the entire water transmission system will be interconnected from Nut Tree Road to Leisure Town Road.

Water Transmission

Considering probable pad elevations, the Southtown Project will be served from Vacaville's main pressure zone. The criteria for water delivery are:

- Water will be delivered under average day and peak hour demand conditions at a residual pressure ranging from 30 to 90 psi.
- Water will be delivered under maximum day plus fire flow demands at a minimum residual pressure of 20 psi.

The ability of Vacaville's distribution system to meet these requirements was analyzed, through computer simulation of the water distribution system in light of development of the Southtown Project. The existing water distribution system near the Project site consists of a dead-end 12-inch water main on Vanden Road, extending south of Alamo Drive. The computerized model indicated that this existing water main is not sufficiently sized to meet the fire flow requirement of 4,500 gallons per minute (gpm), as required by the City's *Water System Master Plan*. This is a **potentially significant impact**, and mitigation is required.

The City's *Water System Master Plan* identifies DIF-88 partially located within the Project site. The DIF-88 pipeline is planned as an 18-inch pipeline to extend from Peabody Road around the southeast perimeter of the city boundaries and north along Leisure Town Road to Elmira Road (see Figure 3.10-6). This pipeline is scheduled for construction in 2005 to provide service to future developments.

The water system distribution model also examined buildout conditions to evaluate system performance with the addition of the proposed Project. The buildout distribution system, including the DIF 88 pipeline, will provide adequate residual pressures throughout the City and the Project site, even during fire flow simulation.

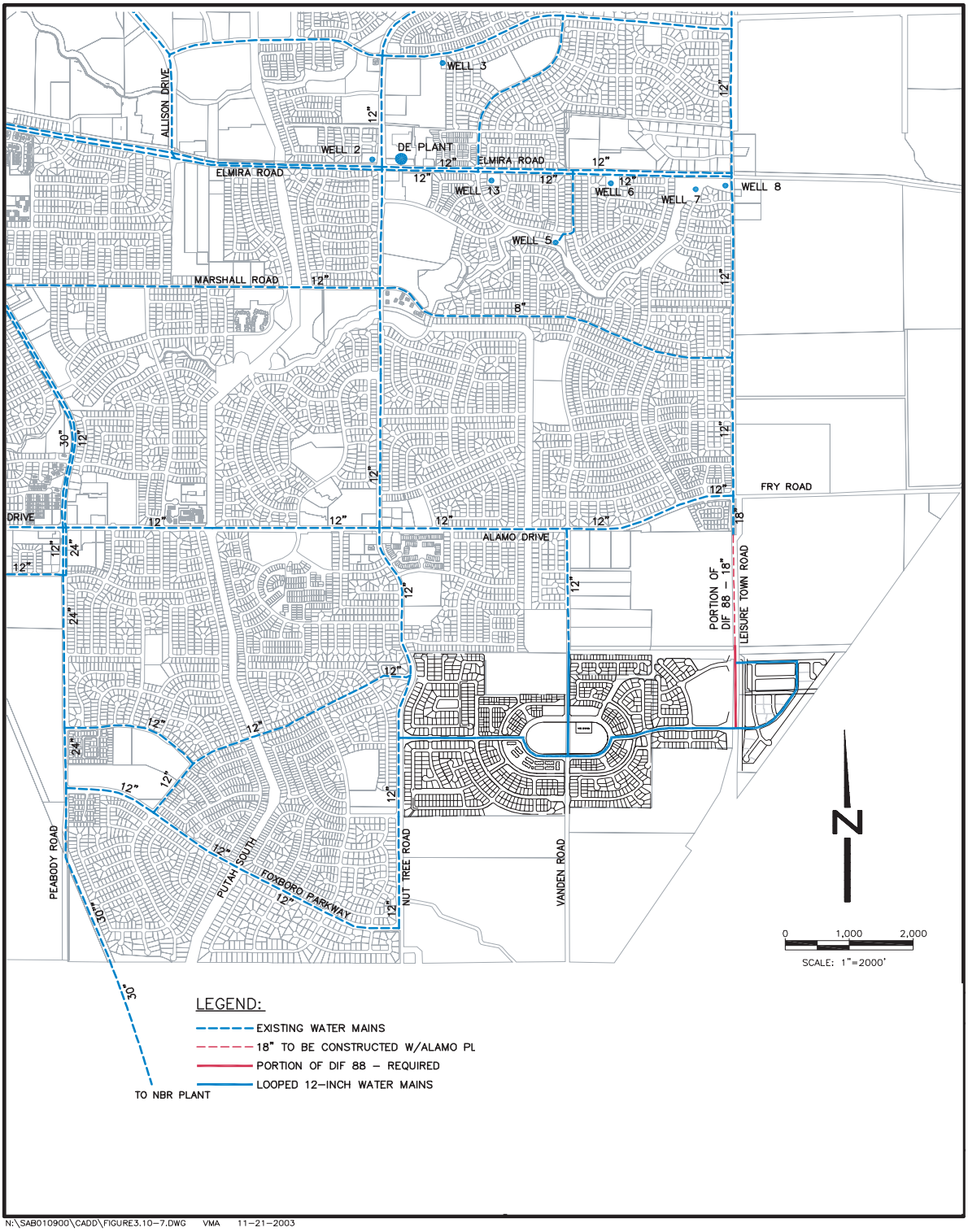


Figure 3.10-6
Portion of DIF 88 Required for Southtown Project

Mitigation Measure UTI-1

Based on the proposed pad elevations for the Southtown project several residential lots with pad elevation less than 120 feet will experience pressures exceeding the maximum residual pressure range of 88 psi. These lots will have to be designed with individual pressure regulating valves to ensure the pressure to each user does not exceed 88 psi.

Mitigation Measure UTI-2

The City's *Water System Master Plan* identifies the Development Improvement Fee (DIF) 88 pipeline to be partially located within the Project site. Development of the Southtown project will require connection and/or participation in the construction of a portion of the DIF 88 pipeline. The DIF 88 pipeline is planned as an 18-inch pipeline to extend from Peabody Road around the southeast perimeter of the city boundaries and north along Leisure Town Road to Elmira. The portion includes the 18-inch water main along Leisure Town Road from the existing 18-inch water main on Leisure Town Road near Alamo Drive to the southern-most common intersection between the Southtown and Moody portions of the Project site (see Figure 3.10-6).

In addition, the Southtown project shall include the construction of 12-inch or larger water main loops within the Project site, connected at Leisure Town Road (portion of DIF 88 pipeline), Nut Tree Road (existing 12-inch water main), and Vanden Road (existing 12-inch dead-end water main) to serve the proposed land use. The looped water system improvements will be sufficient to deliver adequate fire flow and comply with the City's design criteria as outlined in the *Water System Master Plan*.

A study of the water distribution system improvements for the Southtown project area shall be prepared by a registered civil engineer prior to approval of improvement plans for the Southtown project. The study shall be prepared in accordance with the requirements of the Vacaville Department of Public Works, Utilities Division. The study report shall include but not be limited to:

- **Maps showing the location of affected existing and all proposed water distribution system facilities, the water service area boundaries, and the location of water main connection points.**
- **Summary results from an approved computer model of the proposed water distribution system, including average day demand and estimated residual pressures throughout the project site. Conditions to be modeled include existing conditions plus individual project phases as well as project buildout.**
- **Appendices documenting all input parameters and significant output data from a City-approved computer model used to predict residual pressure and verification of water main sizing.**

Mitigation Measure UTI-3

To mitigate the lack of adequate non-potable water distribution system to serve the proposed Southtown project, a study of the existing SID non-potable system serving the agricultural users in the area shall be prepared by a registered civil engineer prior to approval of improvement

plans for the Southtown project. The non-potable system study shall be prepared in accordance with the requirements of the Vacaville Department of Public Works, Utilities Division. The study report shall include but not be limited to:

- **Maps showing the location of affected existing non-potable water distribution system facilities and all proposed non-potable water distribution system improvements, the non-potable water service area boundaries, and the location of non-potable water main connections.**

Improvements to the non-potable water distribution system identified in this study, including necessary facilities, equipment, and infrastructure, shall be provided by the developer prior to issuance of building permits for the Southtown development.

Following incorporation of the mitigation measures identified above, impacts related to the City's water system resulting from development of the proposed Project are considered **less than significant**.

Impact UTI-2: Access to Sufficient Water Supplies

Pursuant to the requirements of Senate Bill 610, a water supply assessment was prepared for the Southtown Project (see Appendix E). In order to determine the City's ability to provide sufficient water supplies to the Southtown Project, the anticipated water demand of the Project was established. This demand was then analyzed in relation to the City's existing and planned water supply sources. The results of this comparison are provided in the analysis below.

The City currently uses two sets (existing and growth) of water demand factors to plan for and analyze the water supply and distribution systems. The difference between the two sets of demand factors is the contingency which reflects uncertainties in projecting future land use and generation rates for undeveloped land. It also involves differences in the nature of new development and existing development within a given land use category. The Southtown Project's anticipated water demand shown in Table 3.10-12 was established using the City's adopted growth factors.

Table 3.10-12
City of Vacaville Summary of Water Demand Factors Existing and Future Development

Land Use	Designation	Unit	Existing Development		Future Development	
			Potable gpd/unit	Irrigation gpd/unit	Potable gpd/unit	Irrigation gpd/unit
Res.l Low Medium Density[a]	RLMD	Du	340	0	420	0
Residential Low Density[a]	RLD	Du	380	0	520	0
Residential Estates[a]	RE	Du	680	0	600	0
Rural Residential	RR	Du	850	0	1000	0
Residential Medium Density	RMD	Du	300	0	350	0
Residential High Density	RHD	Du	260	0	300	0
Residential Urban High Density	RUHD	Du	210	0	250	0
Manufactured Homes	MH	Du	260	0	300	0
Retirement Residential	RetRes	Du	300	0	350	0
Office	O	Ac	1,000	500	1,600	450
Business Park	BP	Ac	1,000	400	1,600	450
Industrial	IND	Ac	1,200	400	2,000	450
Retail Sales	RS	Ac	1,000	400	1,600	450
Downtown	D	Ac	3,900	100	3,900	100
Commercial Highway[a]	CH	Ac	1,700	400	4,750	450
Commercial Service	CS	Ac	1,000	400	1,600	450
Public	P	Ac	1,000	400	1,600	450
Park	PK	Ac	0	1300	0	2,100
Park Regional	PR	Ac	100	1500	170	2,500
Elementary School	ESC	stu/ac	25	900	30	1,500
High School	HSC	stu/ac	35	900	40	1,500
Open Space	OS	Ac	0	0	0	0
Hospital	HOS	Ac	1,400	500	2,300	450
Agricultural	AG	Ac	0	0	0	0

West Yost & Associates, *Water and Sewer Planning Factors Reconciliation –Final Draft*, April 1994.
[a] Future development demand factors determined by actual metering information obtained from the City of Vacaville, August 2003.

Source: SB 610 Water Supply Assessment, September 2003

Tables 3.10-13 and 3.10-14 show Southtown's projected potable and non-potable water demand during a normal hydrologic year. This demand is added to existing usage and planned projects to estimate total future demand, as shown in Table 3.10-15. The projected water demand is determined through consideration of all existing and future development of the City. Land use designations for major projects that are currently being processed through the City's Planning Department were used to determine projected demand. For areas without current development proposals, the General Plan land use designations were used.

Table 3.10-13
Southtown Project Summary of Estimated Potable Water Demands Supplied By Vacaville

Land Use/Designation	Quantity/ Units	Potable gpd/unit	Irrigation gpd/unit	Potable gpd	Irrig. gpd	Total gpd	AF/ YR
Residential Low Density (RLD)	180 units	520	0	93,600	0	93,600	
Residential Low/Medium Density (RLMD)	650 units	420	0	273,000	0	273,000	
Residential Medium (RMD)	275 units	350	0	96,250	0	96,250	
Residential Medium/High Density (RMD)	135 units	350	0	47,250	0	47,250	
Residential High Density (RHD)	357 units	300	0	107,100	0	107,100	
Public Low (PL)	1.0 acres	1,600	0	1,600	0	1,600	
Park (PK)	33.5 acres	0	0	0	0	0	
Commercial Service (CS)	22.8 acres	1,600	0	36,480	0	36,480	
Totals	--	--	--	655,280	0	655,280	734

Table 3.10-14
Southtown Project Summary of Estimated Non-Potable Water Demands Supplied By SID

Land Use/Designation	Quantity/ Units	Potable gpd/unit	Irrigation gpd/unit	Potable gpd	Irrig. gpd	Total gpd	AF/ YR
Public Low (PL)	1.0 acres	0	450	0	450	450	
Park (PK)	33.5 acres	0	2,100	0	70,350	70,350	
Commercial Service (CS)	22.8 acres	0	450	0	10,260	10,260	
Arterial Landscape (CS)[a]	13.0 acres	0	450	0	5,850	5,850	
Total				0	86,910	86,910	97

[a] Arterial landscape total acreage is estimated at 5% of total project gross area (260 acres) and estimated as CS land use.

Availability of water supply is dependant on the hydrologic cycle. It is common practice to analyze water supply during a normal year, a single dry year, and multiple dry years. The definitions of these terms are:

- ***Normal Year*** – This is a year when average rainfall has been received. During a normal year, the water availability from some sources may be less than the entitlement amount.
- ***Single Dry Year*** – This is a year when less than average rainfall has been received and may be the first year of a multiple year drought.
- ***Multiple Dry Years*** – This is a series of years when less than average rainfall has been received.

An analysis of available water supplies was prepared as part of an *SB 610 Water Supply Assessment Report* for the City. Table 3.10-16 compares the projected water demand in the City to the water supply during a normal, single dry, and multiple dry year conditions. The 2005 available normal water supply for the City is 33,060 ac-ft/yr. In Year 2025, normal water supply for Vacaville will reach 41,990 ac-ft/yr, while the estimated normal water demand (including the proposed Southtown project) is approximately 32,333 ac-ft/yr. As shown in Table 3.10-16, sufficiency water supply can be demonstrated under a variety of delivery conditions.

Table 3.10-15
Vacaville Annual Water Demand – Normal Year (AF/YR)

Item	Demand (ac-ft/yr)
Existing City 2002 (average day demand)	17,912
Lower Lagoon Valley (potable)	939
Lower Lagoon Valley (non-potable)	623
Rice McMurtry	194
Southtown (potable)	734
Southtown (non-potable)	97
Other Future Development in City	11,834
Total Demand	32,333

Table 3.10-16
Summary of Projected Water Demand versus Supply during Normal, Single-Dry and Multi-Dry Years

Year	Projected Demand (ac-ft/yr)	Supply (ac-ft/yr)		
		Normal Year	Single-Dry Year	Multi-Dry Year
2005	19,221	33,060	32,216	29,553
2010	22,499	38,560	37,816	35,603
2015	25,777	41,440	40,696	38,383
2020	29,055	41,990	41,346	39,031
2025	32,333	41,990	41,346	39,031
Nolte Associates, Inc.				

Under drought conditions, Vacaville has the ability to limit water demand through public awareness and enforcement of water conservation ordinances. The City's Urban Water Shortage Contingency Plan includes Ordinance Number 1431, which established the City's water conservation requirements and water rate structures to address normal, drought, and emergency conditions. As drought and emergency conditions are declared by the City Council, additional rate tiers are added to the existing rate structure to promote conservation. A target water use amount is determined for all residential customers and based on past usage patterns for commercial, industrial, and landscape customers. Customers using water above their target amount pay increasingly higher rates for water.

The City also implements short-term and long-term water conservation programs, as established by the *2000 Urban Water Management Plan* update. Historically, conservation programs have been effective in reducing water demand.

Table 3.10-17
Reduced Annual Water Demand (AF/YR)
Single Dry Year

Demand	2005	2010	2015	2020	2025
Existing City (baseline)	16,695	16,695	16,695	16,695	16,695
Lagoon Valley	225	450	675	900	1,125
Rice McMurtry	34	68	103	137	173
Southtown	149	297	446	594	742
Other Future Development in City	2,279	4,558	6,836	9,115	11,398
Total Demand	19,382	22,068	24,755	27,441	30,133

Source: SB 610 Water Supply Assessment, September 2003

Table 3.10-18
Reduced Annual Water Demand (AF/YR)
Multiple Dry Years

Demand	2005	2010	2015	2020	2025
Existing City (baseline)	14,840	14,840	14,840	14,840	14,840
Lagoon Valley	200	400	600	800	1,000
Rice McMurtry	30	60	90	120	150
Southtown	132	264	396	528	660
Other Future Development in City	2,026	4,052	6,078	8,104	10,134
Total Demand	17,228	19,616	22,004	24,392	26,784

Source: SB 610 Water Supply Assessment, September 2003

Table 3.10-19
Projected Demand and Supply (AF/YR)

Year	Normal Year		Single Dry Year		Multiple Dry Years	
	Projected Demand	Available Supply	Projected Demand	Available Supply	Projected Demand	Available Supply
2005	21,535	33,060	19,382	32,216	17,228	29,553
2010	24,520	38,560	22,068	37,816	19,616	35,603
2015	27,505	41,440	24,755	40,696	22,004	38,383
2020	30,490	41,990	27,441	41,346	24,392	39,031
2025	33,480	41,990	30,133	41,346	26,784	39,031

Source: SB 610 Water Supply Assessment, September 2003

Groundwater and surface water supplies are projected to exceed anticipated water demands even during extended drought conditions. This has been demonstrated during the most recent previous drought that lasted approximately seven years. In light of the City's conjunctive water supply strategy and the demonstrated reliability of the water supply resources, it has been determined that future water supply will be adequate to offset future water demands during hydrologic normal, single, and multiple dry years. However, groundwater wells need to be rehabilitated and/or replaced with time and the water demand from the Southtown Project is comparable to the production capacity of one groundwater well. Furthermore, future Well No. 19 is currently planned within the Southtown project area and required to meet Year 2025 water demand.

This is considered a **potentially significant** impact.

Mitigation Measure UTI-4

To mitigate the impact of increasing water demand, development of the Southtown project must include a provision to provide the City with a well site. Construction of the well site would be funded via development impact fees.

Following incorporation of the mitigation measure identified above, impacts related to the City's water system resulting from development of the proposed Project are considered to be **less than significant**.

Impact UTI-3: Sufficient Water Storage Facilities

City-Wide Storage Considerations

The *Water System Master Plan* for the City specifies requirements for total water storage in the City's distribution system. As noted previously, there are three components to total storage: operational, emergency, and fire. Operational and emergency storage are established as 25 percent and 50 percent of maximum day demand, respectively. Storage for fire fighting purposes is based upon a demand of 4,500 gpm sustained for 4 hours. This is the highest fire flow requirement (industrial, commercial, and high density residential land uses) described in the *Water System Master Plan*.

As presented in the City of Vacaville, *Infrastructure, Facilities and Services, Status Report 2003 Update*, Table 3.10-20 summarizes the total system storage requirements for the City based on the actual maximum day demand in 2001-2003 and projected maximum day demand in the years 2004-2007. The current shortfall in planned water storage is approximately 5.2 MG. The City Council has authorized design of a new 5.1 MG capacity reservoir (McMurtry Reservoir) near the Rice McMurtry area. The construction of the McMurtry Reservoir will help eliminate the current storage deficit. With time, however, additional storage will be necessary. Table 3.10-20 illustrates this future shortfall. The City is currently evaluating sites for additional storage beyond the McMurtry Reservoir.

Table 3.10-20
City of Vacaville Actual and Projected Water Storage Requirements

Year	Maximum Day Demand[a] (mgd)	Water Storage Requirements				Existing Storage[e] (MG)	Total Shortfall[f] (MG
		Operational Storage[b] (MG)	Fire Storage[c] (MG)	Emergency Storage[d] (MG)	Total Requirement (MG)		
2001	26.1	6.5	1.1	10.0	17.6	13.8	3.8
2002	27.4	6.9	1.1	10.6	1836	13.8	4.8
2003	28.0	7.0	1.1	10.9	19.0	13.8	5.2
2004	28.7	7.2	1.1	11.3	19.6	13.8	5.8
2005	29.4	7.4	1.1	11.6	20.1	13.8	6.3
2006[g]	30.2	7.5	1.1	12.0	20.6	18.9	1.7
2007[g]	30.9	7.7	1.1	12.4	21.2	18.9	2.3

City of Vacaville
[a] Based on actual maximum day demand for year 2001, 2002, and 2003. Subsequent years are projected at 2.5% increase.
[b] Operational storage is estimated at 25% of the maximum day demand.
[c] Fire storage is estimated at 4,500 gpm for 240 minutes (4 hours).
[d] Emergency storage assumes a 12 hour loss of power, or approximately 50% of maximum day demand. As a mitigating factor, however the DE WTP has backup power for half its capacity (5 MGD) and Well 8 has backup power for its full capacity (2.0 MGD). Assuming the DE WTP can produce water for 10 hours out of the 12 hour loss of power period results in a total production of 2.1 MG. Similarly, Well 8 operating for 12 hours can produce a total of 1 MG of water. Thus, the total available production during the 12 hour loss of power period is (2.1 MG from the DE WTP and 1.0 MG from Well 8) 3.1 MG. Therefore, the emergency storage requirement is actually 50% of maximum day minus 3.1 MG.
[e] Includes the total capacities of all existing City water storage reservoirs.
[f] Total Shortfall is estimated as the difference between the total storage requirement and existing storage.
[g] Existing storage is increased by 5.1 MG in 2006 with the planned completion of the McMurtry Reservoir.

Water Storage

The City's *Water System Master Plan* specifies requirements for total water storage within the distribution system related to operational, emergency, and fire flows. Operational and emergency storage are established as 25 percent and 50 percent of maximum day demand, respectively. Storage for fire fighting purposes is based upon a demand of 4,500 gpm sustained for four hours. This is the highest fire flow requirement, for industrial, commercial, and high density residential land uses, described in the Master Plan.

The City's 2000 *Urban Water Management Plan* update addressed water storage requirements for Vacaville based on the actual maximum day demand in 2000 and the projected maximum day demand in the years 2005, 2010, 2015, and 2020. The current shortfall in water storage is approximately 5.4 million gallons (MG). Vacaville is currently in the design phase for a new 5.3 MG capacity reservoir, near the Rice McMurtry area of the city. The construction of this reservoir will help eliminate the current storage deficit. With time however, additional storage will be necessary and the City is currently evaluating locations for additional reservoirs. Water storage requirements for the next several years are detailed in Table 3.10-20.

The Southtown Project will be required to pay the City's Development Impact Fee for water to provide adequate financing for planning, design, construction, and inspection of water supply and distribution system projects. The City's fee program is adjusted annually to reflect inflation and

other changes in the cost of providing service, and, every five years or when a major change occurs that would impact fees, can be significantly revised. Water fees are assessed based on meter size and average citywide consumption for each meter size. The charges are based on equivalent dwelling unit (EDU) factors and assessed relative to a single family home, which is one EDU. For example, development of one single family home would be equivalent to 1.0 EDU, would require a one-inch meter, and would be required to pay $6,010 for the City's water connection fee. It is anticipated that the infrastructure needed to support the Southtown Project will be financed through a combination of developer funds and existing impact fee reserves. The impact is considered **less than significant**.

Impact UTI-4: Exceed Wastewater Treatment Requirements of the Central Valley Regional Water Quality Control Board

The Central Valley Regional Water Quality Control Board regulates quality of wastewater treatment plant discharges. The Project will result in an increase in flow and load to the Easterly Wastewater Treatment Plant consistent in quality with typical residential and commercial development in Vacaville. The expansion of the Easterly Wastewater Treatment Plant is anticipated to be completed in 2004, prior to occupancy of the proposed Project, and was sized to accommodate growth throughout the City of Vacaville, including the Project area. The additional quantity of wastewater flow and load generated by the Project is therefore not expected to result in the violation of any wastewater treatment requirements for which the plant was designed, nor change the ability to meet or cost of meeting additional requirements currently being considered. The impact is considered **less than significant**.

Impact UTI-5: Require New or Expanded Wastewater Treatment Facilities

In order to quantify potential impacts to the City's wastewater system, the projected wastewater flow from buildout of the Project area must be calculated. As seen in Table 3.10-21, the average wastewater flow expected from the Project is 523,700 gpd or 0.52 MGD. The peak flow from the Project area was predicted using a peaking factor of 1.8 multiplied by the predicted average flow and then adding an allowance of 2,000 gallons per day (gpd) per acre for the inflow and infiltration factor in accordance with the *CSP-S Trunk Sewer Service Area Master Plan* (Master Plan). Based on these factors, the PWWF from the project area is expected to be 1.55 MGD.

Table 3.10-21
Wastewater Flow Projections for the Southtown Project

Area	Land Use	Units	Quantity	Factor gpd/unit	Average Flow (gpd)
Southtown Residential	Single and Multifamily	du	1,355	300	406,500
Town/Community Center	Commercial	acres	14.0	1,900	26,600
Commercial	Commercial	acres	3.0	1,900	5,700
Open Space	Open Space	acres	1.0	--	--
Moody Residential	Single Family	du	240	300	72,000
Commercial/Self Storage	Commercial	acres	6.8	1,900	12,900
Park	Open Space	acres	0.4	--	--
				Total Projected Wastewater Flow	523,700

Source: West Yost & Associates, September 2003

Development of the Project will result in an increase in the amount of wastewater treated at the Easterly Wastewater Treatment Plant. However, as noted above, the expansion of the Easterly Wastewater Treatment Plant is anticipated to be completed prior to occupancy of the proposed Project and has been sized to accommodate growth in the Project area. Future treatment plant expansions will be needed to serve build-out of the General Plan and will be funded through development impact and utility fees.

Wastewater DIF Project Nos. 54A, 54B, and 54C will benefit the Project area. These projects, as currently anticipated, will convey combined flows from the Alamo Drive, Fry Road, and CSP-S Trunk Sewer Service Area directly to the Easterly WWTP. A portion of the additional capacity provided by DIF 54A, B, and C will be needed to serve the Project area. Two potential routes for DIF 54A are shown on Figure 3.10-7, based on recent master planning[1]. The timing of the DIF improvements will depend on the pace of development in the Project and surrounding areas.

Based on proposed Project design as well as the surrounding area, which may also be served by the trunk sewer system in this area, the wastewater collection system analysis divided the area into three primary sub-areas. The analysis identified a different existing or proposed trunk sewer branch to serve each sub-area. The three primary sub-areas and the general points of connection to the trunk sewer system are shown on Figure 3.10-7 and potential impacts related to available pipeline capacity are discussed below for each sub-area.

Sub-Area 1

Sub-area 1 is located within the northwestern corner of the Project site and is proposed to contain approximately 133 single family homes. As proposed, wastewater flow generated from this sub-area will be directed to an existing, small diameter sewer pipeline on Nut Tree Road and conveyed to the beginning of the modeled trunk sewer system at Summerville Drive, south of Alamo Drive.

Estimates of existing wastewater flow as well as pipeline slope and capacity would be needed to verify the adequacy of the smaller diameter sewer in Nut Tree Road to accommodate anticipated flows from Sub-area 1. Based on inspection of previous modeling results, the modeled trunk sewer system in Nut Tree Road has adequate capacity to accommodate the proposed wastewater flow[5,6]. Existing PWWF in approximately 1,200 ft of the Alamo Drive sewer has the potential to exceed the pipeline gravity flow capacity and produce minor surcharging[5]. The downstream Fry Road sewer is also subject to minor surcharging under PWWF conditions. These conditions would be exacerbated by the project and could trigger the need for construction of DIF 64, and/or DIF 54C. More detailed modeling based on the proposed configuration would be needed to determine whether or not the project triggers the planned improvements. An interconnection structure is currently being designed by the City to reduce the potential for surcharging in the Fry Road sewer by temporarily redirecting excess flows to the CSP-S Trunk Sewer. This short-term solution could delay the need for DIF 54A and 54C, but would not be effective once flows in the CSP-S Trunk Sewer significantly increase.

Sub-Area 2

Sub-area 2 encompasses the central portion of the Southtown Project site and is bisected by Vanden Road. This portion of the Project area is expected to comprise approximately 520 to 580 residential dwelling units and approximately 17 acres of commercial land uses. These land uses would generate 0.60 to 0.63 MGD of peak wet weather flow (PWWF). As designed, wastewater flow from Sub-area 2 will be delivered to the existing 24-inch diameter CSP-S Trunk Sewer at several points along Vanden Road. Based on current city land use planning as well as flow projections estimated using the Master Plan methodology, there is approximately 0.62 MGD of PWWF capacity in the CSP-S Trunk Sewer available to the Southtown Project. This assumes the entire gravity flow capacity of the trunk sewer between the Project area and the Southern Pacific Railroad right of way is used at buildout of the service area and that 0.78 MGD of PWWF capacity is reserved for growth in the remainder of the service area, as defined in the Master Plan.

Sub-Area 3

Sub-area 3 encompasses the remaining portion of the Southtown Project site, including the Moody portion of the site, and is expected to contain approximately 820 to 880 residential dwelling units and approximately 6.8 acres of commercial land uses. As designed, wastewater flow from this sub-area will be collected in a new trunk sewer extension through the Moody portion of the site and across Alamo Creek, which will then discharge to the CSP-S Trunk Sewer on the north side of Alamo Creek, near the Southern Pacific Railroad. This trunk sewer extension will need to have adequate capacity to accommodate future development in areas south of the Southtown Project site, in accordance with the Master Plan. Based on current City land use planning and the proposed Project, the combined PWWF in the trunk sewer extension would be approximately 2.01 MGD. A new pipe at minimum slope and sized to convey the total PWWF at 80 percent of the full-pipe gravity flow capacity would have a diameter of 18 to 21 inches. This pipeline is shown conceptually on Figure 3.10-7 as "new trunk sewer." Final pipeline sizing should be based on a model of the proposed collection system to refine the projection of PWWF.

Ultimately, wastewater flow from the new trunk sewer extension in sub-area 3 and the CSP-S Trunk Sewer would combine on the north side of Alamo Creek at the Southern Pacific Railroad. This improvement is identified as sewer DIF 54B; however, it would not be funded through the DIF program. Based on a preliminary estimate, the total PWWF in the downstream pipeline would be

approximately 7.5 MGD. A new pipe at minimum slope and sized to convey the total PWWF at 90 percent of the full-pipe gravity flow capacity would have a diameter of 36 inches. It may be possible to construct this pipeline at a greater slope and reduced diameter.

At Fry Road, wastewater flow from the CSP-S Trunk Sewer will ultimately be combined with wastewater flow from Fry Road[5]. The preliminary estimate of PWWF downstream of this point is 13.2 MGD. A 36- to 39-inch sewer pipeline would be required to convey this flow, depending on the route and pipeline slope. Final pipeline sizing should be based on a model of the proposed collection system. The model would provide a refined projection of PWWF and pipeline sizing.

Impacts to the City's wastewater collection system are considered **potentially significant**.

Mitigation Measure UTI-5

A Sewer Study (Study) for the Project area and downstream trunk sewer system shall be prepared by a registered civil engineer prior to approval of improvement plans covering either areas served by the existing Nut Tree Road sewer or areas served by any new sewer 12-inch or larger in diameter. The Study shall be in accordance with requirements of the Vacaville Department of Public Works, Utilities Division. The Study report shall include at least the following:

- **Maps showing the location of affected existing and all proposed wastewater collection system facilities, the sewer service area boundaries, and the location of analysis points.**
- **Assumed land uses for all areas of future development tributary to the modeled facilities.**
- **Summary results from an approved computer model of the proposed collection system, including ADWF and PWWF design flows and predicted hydraulic grade line at each analysis point. Flow conditions to be modeled include existing conditions plus build-out of the project and build-out of the service area.**
- **The modeled ADWF, PWWF and PWWF hydrograph for offsite flows at the point they enter the Project area or downstream affected facilities.**
- **Required pipeline diameters and invert elevations for proposed new and replacement trunk sewers (12-inch diameter and larger).**
- **Collection system improvement phasing identifying which improvements are needed for each development phase.**

Appendices documenting all input parameters and significant output data for a City-approved computer model used to predict peak flows and verify pipe sizing.

Mitigation Measure UTI-6

A trunk sewer extension through the Moody portion of the Project site shall be constructed when needed to serve the Project as identified in the required Sewer Study. The trunk sewer shall extend from Leisure Town Road, to a point on the north side of Alamo Creek where it shall connect to the CSP-S Trunk Sewer. A conceptual alignment of this sewer is labeled on Figure 3.10-7 as "new trunk sewer". The trunk sewer shall be sized to accommodate offsite flows from the planned service area south of the Project. The trunk sewer shall extend south on Leisure Town Road to the limits of roadway improvements included in the Project.

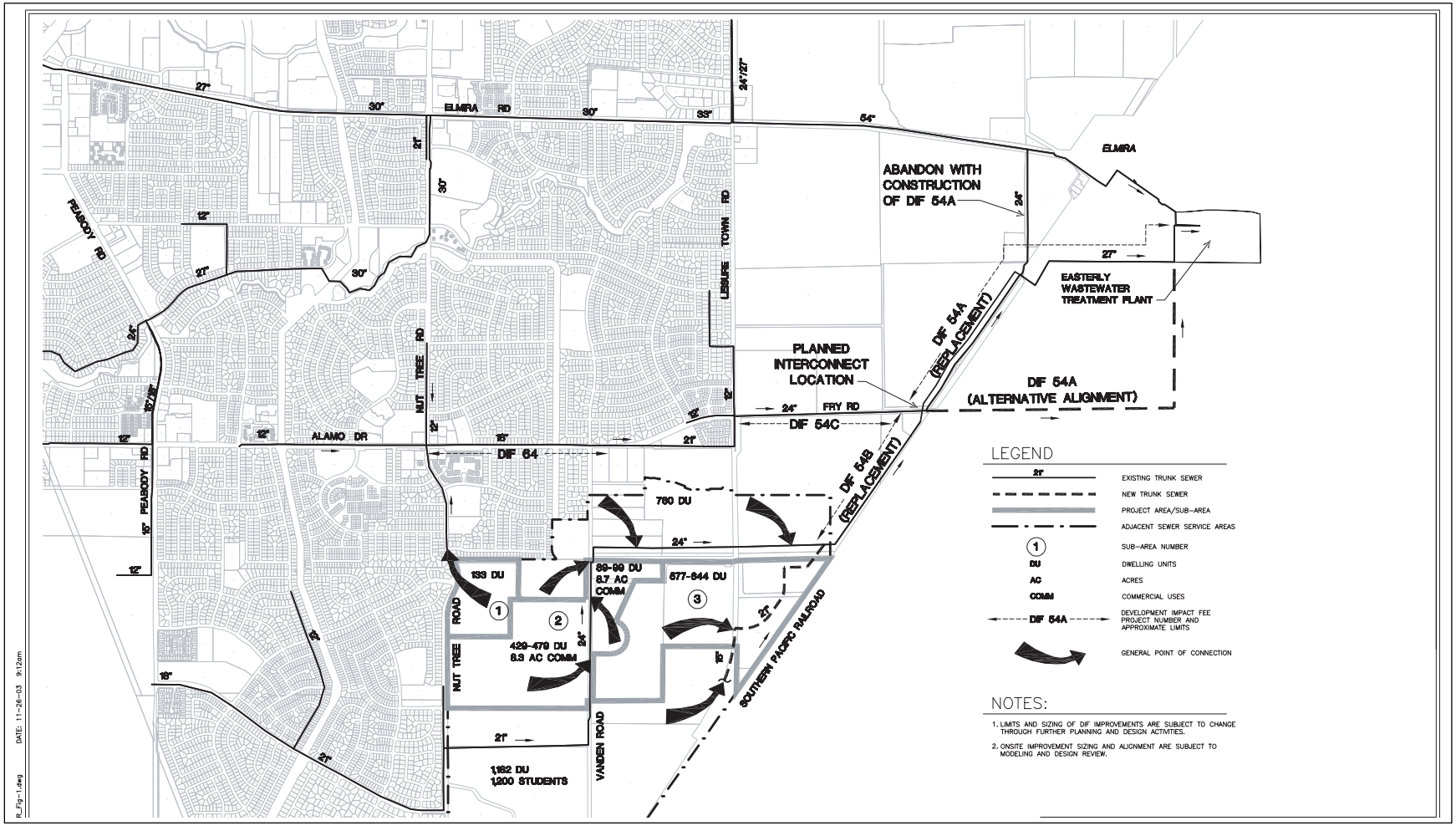


Figure 3.10-7
Planned Trunk Sewer Improvements

Mitigation Measure UTI-7

The Project proponent shall fund DIF 54B at such time as the trunk sewer extension south of Alamo Creek, through the Moody portion of the Project site, is constructed. The improvement shall replace the portion of the existing CSP-S Trunk Sewer from Alamo Creek to a point of connection near the intersection of Fry Road and the Southern Pacific Railroad right-of-way.

Mitigation Measure UTI-8

Development impact fees shall be paid to fund other required offsite trunk sewer and treatment plant improvements as identified and scheduled by the City through periodic master planning and design activities.

Under the terms of the JPA with the California Department of Corrections, a revision of the CSP-S Trunk Sewer Service area was adopted April 22, 2003, in conjunction with a revised benefit district to optimize system performance. A portion of the Project area is within the CSP-S Trunk Sewer service area and the associated benefit district. Therefore, development of the portion of the Project located within the defined service area will be subject to the benefit district fees.

In accordance with the CSP-S Trunk Sewer Master Plan, a revised service area boundary was identified for the CSP-S Trunk Sewer. This boundary was to be used to establish a revised benefit district in order to recover the remainder of the construction cost owed by agreement with the State Department of Corrections. The benefit district would need to be further revised or an additional benefit district created to the extent that the Project would modify the area to be served by the CSP-S Trunk Sewer. Although this impact does not meet a level of significance pursuant to CEQA, one of the two scenarios identified in the following mitigation measure is required to coordinate the benefit district with the trunk sewer service area.

Mitigation Measure UTI-9

The City shall work with the Project proponent to either modify the appropriate benefit district documents to reflect the modified sewer service area or identify an alternative method of paying the portion of reimbursement due to the State upon development of the Project area.

Additionally, in accordance with the City's design standards, dedications of permanent easements for sewer lines within the Southtown Project that are not located within the public right-of-way will be established for excavation, replacement, and general maintenance activities performed by the City. In addition to the pipeline easements, the Southtown Project will provide the City with all-weather access to the sewer manhole tops to perform both routine and emergency cleaning and/or inspections.

Other than construction of the internal facilities to support transmission of wastewater generated by the proposed Project land uses, the Southtown Project will not require any new or expanded wastewater system or wastewater treatment facilities. Following incorporation of the mitigation measures identified above, impacts related to the City's wastewater system resulting from development of the proposed Project are considered **less than significant**.

Impact UTI-6: Access to Sufficient Solid Waste Facilities

The Southtown Project will include the construction of 1,265 single family dwelling units, 330 multiple family dwelling units, and approximately 30,000 square feet of commercial floor space. Table 3.10-22 provides information regarding anticipated waste generation resulting from the proposed land uses within the Southtown Project. Generation rates for land uses such as community facilities and fire stations are not specifically calculated because they are generally not considered large generators of solid waste.

Table 3.10-22
Solid Waste Generation Rates

Land Use	Generation Rate[1]	Proposed Units	Estimated Annual Generation
Single-family Residential	2.04 tons/unit/year[2]	1,265	2,581
Multi-family Residential	1.17 tons/unit/year[2]	330	386
Commercial	0.0024 tons/sq ft/year[2]	30,000 sf	72
		Total Estimated Generation (tons/year)	3,039

Notes:
1. Generation rates are provided by the California Integrated Waste Management Board (CIWMB), as extracted from various sources received from cities and counties.
2. Rates obtained by CIWMB from Ventura County Guidance on Evaluating Solid Waste Impacts

Source: Land Use Plan, CIWMB 2003

The solid waste stream anticipated from the Southtown Project is approximately 3,039 tons per year or approximately 10 percent of the monthly intake permitted at the Hay Road Landfill. Curbside recycling collection will also be available within the proposed single family residential areas and may serve to reduce the solid waste stream from the Project. The Southtown Project's minimal increase in the City's solid waste stream is considered **less than significant**.

Impact UTI-7: Provision of Electricity and Natural Gas Service

The Southtown Project is located within the service area of the Pacific Gas and Electric (PG&E) Company. Pacific Gas and Electric can provide both electricity and natural gas service to all planned land uses in the Project through expansion of nearby infrastructure and use of existing power and gas grids. PG&E is the electricity and gas provider to all of Vacaville. The site is not constrained by any features that may limit or impair the ability of PG&E to provide these services. The impact is less than significant.

[1] West Yost & Associates. *CSP-S Trunk Sewer Service Area Master Plan*, prepared for the City of Vacaville, February 10, 2003.

[2] City of Vacaville. *Infrastructure, Facilities and Services Status Report*, January 2003.

[3] California Regional Water Quality Control Board, Central Valley Region. *Order No. 5-01-044 NPDES No. CA0077691: Waste Discharge Requirements for City of Vacaville Easterly Waste Water Treatment Plant, Elmira, Solano County*. March 15, 2001.

[4] West Yost & Associates. *Easterly WWTP NPDES Permit Compliance Analysis*. August 8, 2001.

[5] West Yost & Associates. *Fry Road/CSP-S Sewer Interconnect Project: Master Plan and Predesign Report*, prepared for the City of Vacaville, May 13, 2003.

[6] West Yost & Associates. Modeling analysis results, model number NEALT2F, 6/24/97; (referenced for pipeline hydraulic capacity only).

3.11 Safety

The Safety section of the Environmental Impact Report considers all potential impacts to the safety of future users of the site, as well as safety of others potentially impacted by the new development. Safety impacts can include exposure to hazardous materials, impacts from nearby airports, and other such issues. A Phase I Environmental Site Assessment (ESA) was performed to assist in assessing safety impacts on site. This ESA was performed in conformance with all of the components of the American Society for Testing and Materials (ASTM) Standard Practice E1527-00 scope of work, and was completed in June, 2003. The purpose of an Environmental Site Assessment (ESA) is to identify environmental conditions, which are defined by the ASTM as:

> The presence or likely presence of hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater or surface water of the property.[1]

The analysis in this section is based in part on the Phase I ESA. Potential hazards impacts, including those related to hazardous materials and wildland fires, are assessed and evaluated. The full text and figures of the Phase I ESA can be found in Appendix J of the Draft EIR.

Environmental Setting

Various portions of the 284-acre Project site are used as wheat/hay fields, cattle or horse pasture, recently plowed fields or fallow land. The site is approximately 98 percent covered by porous materials such as farmland or ditches, with the remaining two percent covered with buildings or pavement. Four residences (one abandoned) are located on the site, along with 15 outbuildings and sheds. These structures total approximately 10,000 square feet.

The farmsteads are each served by domestic drinking water wells. Irrigation water is supplied to the area by the Solano County Water District via the Dally Canal, which traverses the northern part of the project area. There is no sewage disposal service. Each of the occupied farmsteads is served by a septic tank system. One abandoned farmstead has an outhouse. Electricity is supplied to this area by Pacific Gas and Electric. Propane tanks are used at the farmsteads for gas heating.

The Project site is located approximately 2.5 miles north of the Travis Air Force Base, a military installation with active runways.

Regulatory Setting

Hazardous Database Search

State and federal hazardous material databases were searched to determine if the Project site is known to have had hazardous materials present now or in the past. Databases searched as part of this report are shown below in Table 3.11-1. No database includes the Project site as an impacted site. Additionally, no property within a one-mile radius of the site is listed on any of the databases.

Table 3.11-1
Federal and State Databases Searched

Federal NPL (National Priorities List - "Superfund")
Federal RCRA CORRACTS (Corrective Action Sites)
Federal CERCLIS and CERCLIS – NFRAP (No Further Action)
Federal RCRA TSD Facilities
Federal RCRA Generators
Federal ERNS List
State lists of hazardous waste sites identified for investigation or remediation
(NPL or CERCLIS equivalents: AWP, BEP and CAL-SITES)
Toxic Pits Cleanup Act sites (TP)
State Solid Waste Facilities and/or Landfill Facilities site lists (SWF/LF and WMUDS/SWAT)
California Hazardous Material Incident Report System (CHMIRS) and Notify-65
State Leaking Underground Storage Tanks lists (LUST, Cortese)
State registered UST lists (UST and FID)
Former National Priorities List sites (Delisted NPL)
Superfund (CERCLA) Consent Decrees (CONSENT)
Hazardous Materials Information Reporting System (HMIRS)
PCB Activity Database System (PADS)
Facility Index System (FINDS)
Toxic Chemical Release Inventory System (TRIS)
Mines Master Index File (MINES)
Toxic Substances Control Act (TSCA)
Material Licensing Tracking System (MLTS)
Records of Decision (RODS)
Federal Superfund Liens (NPL Liens)
RCRA Administrative Action Tracking System (RAATS)
AST - Aboveground Petroleum Storage Tank Facilities
WMUDS/SWAT - Waste Management Unit Database
HAZNET - Hazardous Waste Information System
SLIC Region - CA SLIC Regions
Waste Discharge System

Agencies with Jurisdiction over Hazardous Materials Related Issues

Hazardous materials and waste regulations are implemented by a number of government agencies including, but not limited to, the following:

- United States Environmental Protection Agency (USEPA);
- California Environmental Protection Agency (EPA) – Division of Toxic Substances Control;
- Regional Water Quality Control Board (RWQCB);
- California Highway Patrol; and,
- Local police and fire departments.

Each of the aforementioned agencies has established regulations regarding the proper transportation, handling, management, use, storage, and disposal of hazardous materials for specific operations and activities. The school districts are required to comply with all applicable regulations related to transport, use, storage, and disposal of hazardous waste.

Methodology

The assessment was performed in conformance with all of the components of the ASTM Standard Practice E 1527-00 Phase I Environmental Site Assessment Scope of Work. The assessment included, but was not necessarily limited to, the activities listed below:

- Site inspections to observe and assess site characteristics of potential environmental concern.
- Limited sampling or use of other documentation to render an opinion as to the existence of asbestos-containing materials (ACMs), lead-based paint (LBP), lead in the drinking water, and the potential for radon exposure.
- Observation of adjacent properties and the subject site vicinity to identify and assess site characteristics of potential environmental concern.
- Review of regulatory agency files to identify and assess any listings of regulatory permits, registrations, enforcement actions, contaminated sites, etc. at the subject site or close enough to affect the subject site.
- Review of site history/land use to identify potential uses that may have contributed to the presence of environmental concerns at the project site.
- Visual inspection of suspect asbestos containing material to provide description, condition and quantity of suspect ACM.
- Development of report to include discussion of the findings of the above tasks.

Thresholds of Significance

Impacts would be considered significant if the Project would:

- Create a significant hazard to the public or the environment through the routine transport, use, disposal of, or reasonably foreseeable release of hazardous materials;
- Emit hazardous emissions or handle hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or environment;
- If the project is within an airport land use plan or, where such a plan has not been adopted, within two miles of a public or private airport, result in a safety hazard for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

Environmental Impact and Mitigation Measures

Impact SAFE-1: Release of Hazardous Materials into Environment

There are several existing features on or near the Project site that have the potential to release hazardous materials into the environment. The Phase I ESA found that a high-pressure underground petroleum pipeline runs along the southeast border of the site, and a pumping plant for that pipeline is located at the southeast corner of the site. Leaks associated with this pipeline and pumping station have occurred in the past, resulting in release of petroleum into the soil. All recorded leaks along the pipeline occurred more than one mile from the Project site, and no record of any leaks in the vicinity of the Project site exists. Leaks occurring at the pumping station were all contained within the station itself, reaching only what is known as secondary containment. Historical records search shows that no leak occurring from the pipeline or pumping station has impacted the Project site, and current procedures to address spills and leaks are sufficient to ensure that residential, commercial, and institutional structures and users of these facilities are not exposed to significant dangers. This pipeline is planned to be relocated several miles from the proposed Project site, and the pumping station will, therefore become inactive.[2]

In addition to the pipeline and pumping station, the Phase I ESA also indicated that pesticides were used in operation of wheat farming on the site. These pesticides were primarily short-lived chemicals that are not known to accumulate or leave hazardous residues in the soil. The ESA

determined that the potential for presence of hazardous materials in the soil from past pesticide use is low, and no impacts are expected as a result.

No other known sources of hazardous materials exist on the site, and construction and operation of residential, commercial, and institutional structures associated with the Project are not expected to result in the release of hazardous materials into the environment. While limited amounts of hazardous materials are expected to be released into the environment from routine maintenance and cleaning associated with structures and landscaping, these releases are generally minimal and do not pose a significant threat to persons in the area. The overall potential for release of hazardous materials into the environment is considered low, and the impact is **less than significant**.

Impact SAFE 2: Proximity to a Designated Hazardous Materials Site

As part of the Phase I ESA, federal, State, and regional databases and records were searched for sites in the vicinity of the Project site that produce, store, or have released hazardous materials in the past. A full listing of the records and databases searched can be found in the Phase I ESA located in Appendix J. Six sites were identified in this search, and are summarized below.

1. *337 Colonial (0.5 mile north of the project area and hydraulically upgradient)*

   This site appears on the CHMIRS database of hazardous-materials releases. A spill of an unspecified quantity of acetone in 1991 is listed. No other information is provided. In view of the distance and time since this spill it does not appear to be of immediate concern to the project site.

2. *118 Spinnaker Court (1/2 mile north of the project area and hydraulically upgradient)*

   This site appears on the CHMIRS database of hazardous-materials releases. A spill of an unspecified quantity of cement in 2001 is listed. No other information is provided. In view of the distance and material spilled it does not appear to be of immediate concern to the project site.

3. *Arco Service Station #5368, 2500 Nut Tree Road (1/2 mile northwest of the project area and hydraulically upgradient)*

   This facility appears on the LUST (Leaking Underground Storage Tank) database. It also appears on the Cortese, Notify 65 and CHMIRS databases. The LUST case type is listed as a release of gasoline to soil only. The current status is given as closed as of 1996. The CHMIRS listing shows a release of 8 gallons of crude oil. In view of the current status of this site it does not appear to be of immediate concern to the project site.

4. *1175 Meadowlark Drive (3/4 mile north of the project area and hydraulically upgradient)*

This site appears on the CHMIRS database of hazardous-materials releases. A spill of 30 gallons of diesel fuel in 1988 is listed. This spill does not appear to be of immediate concern to the project site.

5. *Youngsdale Drive at Silvertop (over one mile west of the project area and hydraulically crossgradient)*

   This site appears on the CHMIRS database of hazardous-materials releases. A spill of 30 gallons of hydraulic oil in 1989 is listed. This spill does not appear to be of immediate concern to the project site.

6. *BP Service Station #11244, 817 Leisure Town Road (1 1/4 mile north of the project site and hydraulically crossgradient)*

   This facility appears on the LUST (Leaking Underground Storage Tank) database. It also appears on the Cortese database. The LUST case type is listed as a release of gasoline that has affected groundwater and drinking water wells. The current status is given as having had a remediation plan filed in September 2002, with a high priority assigned to the case and the case being under the jurisdiction of the Local Oversight Program. Due to the distance of this site it does not appear to be of immediate concern to the project site.

Other listed sites are more than one mile away, not hydraulically upgradient, or otherwise not of immediate concern due to their current status or listing type. This includes any pesticide cleanup activities occurring on the golf course site, adjacent to the Project site. The golf course is located to the southeast of the Project site, which is hydraulically downgradient and therefore unlikely to impact the Project site. With no nearby sites posing known risks to the site of the Project, the impact is considered **less than significant**.

Impact SAFE 3: Impacts Associated with Nearby Airport

CEQA Guidelines suggest that, if a Project is within an airport land use plan, the EIR should consider potential safety hazards for people residing or working in the project area. The Project site is located within close proximity to Travis Air Force Base and is listed under Compatibility Zone D, subject to review by Solano County Airport Land Use Commission (ALUC). The Solano County Airport ALUC has identified land use limitations for development of land within the plan, based on Compatibility Zone.

Compatibility Zone D has no limitations on density or intensity of uses, and prohibits only uses that are a potential hazard to flights. Potentially hazardous uses are defined as physical, visual, and electronic forms of interference with the safety of aircraft operations, including creation of uses likely to attract an increased number of birds. Structures greater than 200 feet in height are considered potentially dangerous to aircraft operation. Proposed General Plan and zoning designations for the site would ensure that all buildings associated with the Project are well below this threshold. Additional criteria in the Land Use Compatibility Plan require the avoidance of the specific characteristics in development within 12,500 feet of the runways at the Travis AFB, including the production of light or glare that could be mistaken for airport lights, sources of electrical interference, and sources of dust or smoke that could impair pilot visibility. The

production of light or glare from streetlights could be mistaken for airport lights, and is considered a potential impact of the development. The following mitigation measure is required to ensure that this impact is reduced to a level of **less than significant**.

Mitigation Measure SAFE-3

Street lighting in the Project shall utilize effective light shielding devices to minimize uplighting and glare to the greatest extent feasible. Light shields shall be installed above and around all street lights, such that no portion of a luminary extends below the base of the light shield. Drop lens luminaries, which are rounded and extend below the lowest portion of the light shield, shall not be used. All street lighting designs, including lens types and shielding devices, shall be approved by the Vacaville Public Works Department prior to installation.

Impact SAFE 4: Potential for Wildland Fires

The Project site is not located within the boundaries of an identified wildland fire hazard area, or within close proximity to heavily wooded wildlands. All buildings and infrastructure associated with the Project will be required to meet fire standards relating to equipment access, construction quality, and fire flow requirements. Problems relating to ingress/egress points are not anticipated. The Universal Building Code and existing Fire Department regulations are sufficient to address fire safety issues. The impact is considered **less than significant**.

Notes and References

[1] U.S. General Services Administration web site. *NEPA Call-In Fact Sheet.* http://hydra.gsa.gov/pbs/pt/call-in/factshet/0797b/07_97_5.htm

[2] California State Lands Commission. *Draft Environmental Impact Report for Concord to Sacramento Petroleum Products Pipeline Project.* June 2003

3.12 Surface Hydrology and Water Quality

This section addresses the potential environmental impacts the Project may have on surface hydrology and water quality in the vicinity of the Project. A water supply assessment and a full drainage report are included as appendices E and F, respectively, to this DEIR.

Environmental Setting

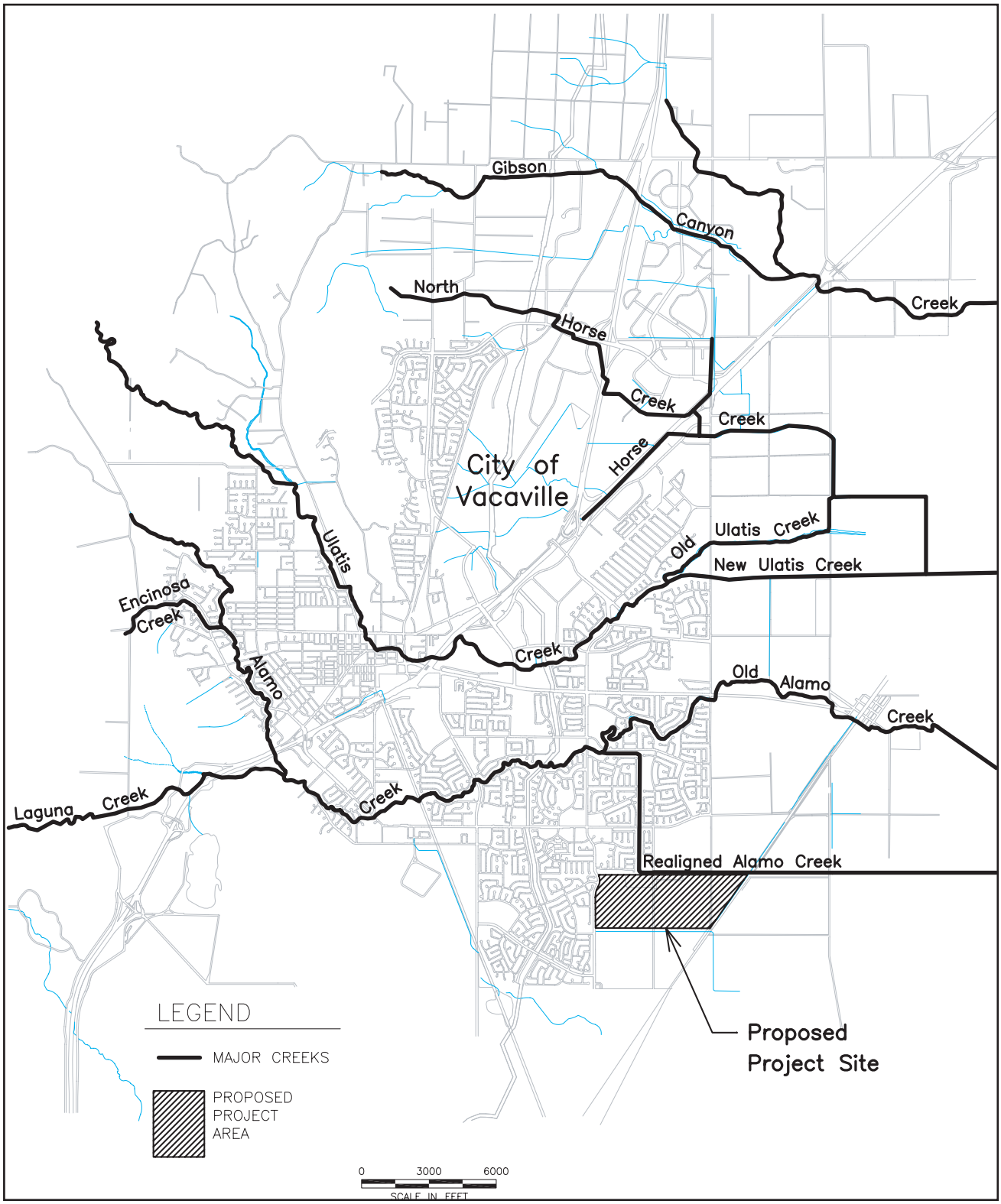
Surface Hydrology

The city of Vacaville, including the Southtown Project site, is located within the lower southeast area of the Ulatis Creek watershed, a 150 square mile area drained by a series of creeks and sloughs. Surface runoff within the watershed generally drains in an east-southeasterly direction and eventually discharges into the Sacramento River. Ulatis Creek originates in the Vaca Mountains and flows in a southeasterly direction to Cache Slough. Other major creeks contributing to the Ulatis Creek watershed that are within the general vicinity of Vacaville include Alamo Creek and its tributaries Laguna Creek and Encinosa Creek, Ulatis Creek, Horse Creek, and Gibson Canyon Creek. The Vaca Mountains, part of the Coastal Ranges, lie along the western boundary of the watershed. The English Hills lie east of the Vaca Mountains, separated by the Vaca Valley. The remainder of the watershed is characterized by flat terrain. Figure 3.12-1 shows the location of the Project site and the major stream courses within the city.

The Southtown Project site is also located within the Alamo Creek watershed because the site is located immediately south of the newly realigned Alamo Creek. New Alamo Creek is an improved trapezoidal channel that is maintained by the Solano Irrigation District. A portion of the Project site currently drains into Alamo Creek, while surface runoff within the remainder of the site drains into the Brazelton Drain, located immediately south of the Project site. The Brazelton Drain drains in a southeastern direction discharging into Barker Slough and ultimately into the Sacramento River.

Topography and Soils

Topography within the Ulatis Creek watershed varies from steep to very flat, which results in a west to east surface runoff flow direction. Soils in the watershed range from shallow loams overlaying sandstone bedrock in the mountainous area to moderately deep layers of sands, silts, and clays in the valley floor. The majority of soils in the Vaca Mountains and English Hills consist of Maymen-Los Gatos loam, Millsholm loam, and Dibble-Los Osos loam. These soils range in permeability from moderate to high, with very high erosion potential. Soils in the Vaca Valley floor and into the Sacramento Valley consist of Brentwood clay loam, Altamont clay, Capay clay and silty clay loams, which are permeable in the moderate to low range.



Source: *West Yost Associates, 2003; adapted by Cotton/Bridges/Associates, 2003.*

Figure 3.12-1
Major Creek Systems

Topography of the Project site is very flat with a slight slope from east to southeast. A majority of the project site consists of Hydrologic Soil Group D, which has very low permeability and very high runoff rates. The northern portion of the project site consists of Group C with a small area of Group B. These soil groups have moderate to low permeability with moderate runoff rates.

Climatic Conditions and Precipitation

Climatic conditions for the area are consistent with the temperature conditions predominant in the Sacramento Valley. The summers are hot and dry, and the winters are cool and moist. Average monthly temperatures range from lows in the 40s and highs in the 50s during the winter months, to lows in the 60s and highs in the 100s during the summer months.

The predominant rainfall season is from November through April, with the heaviest storms of record occurring from December through February. Spatial rainfall distribution over the Vacaville area consists of higher intensities and volumes in the upper elevations of the Vaca Mountains and lower intensities and volumes to the east. Mean annual precipitation varies from 45 inches along the ridgeline of the Vaca Mountains to 23 inches in the flat southeastern portions of the watershed near Elmira. The mean annual precipitation for the general Project vicinity is about 23 inches. The total precipitation depth within the project area for the 10-year, 24-hour design storm is 3.91 inches, and 5.54 inches for the 100-year, 24-hour design storm.

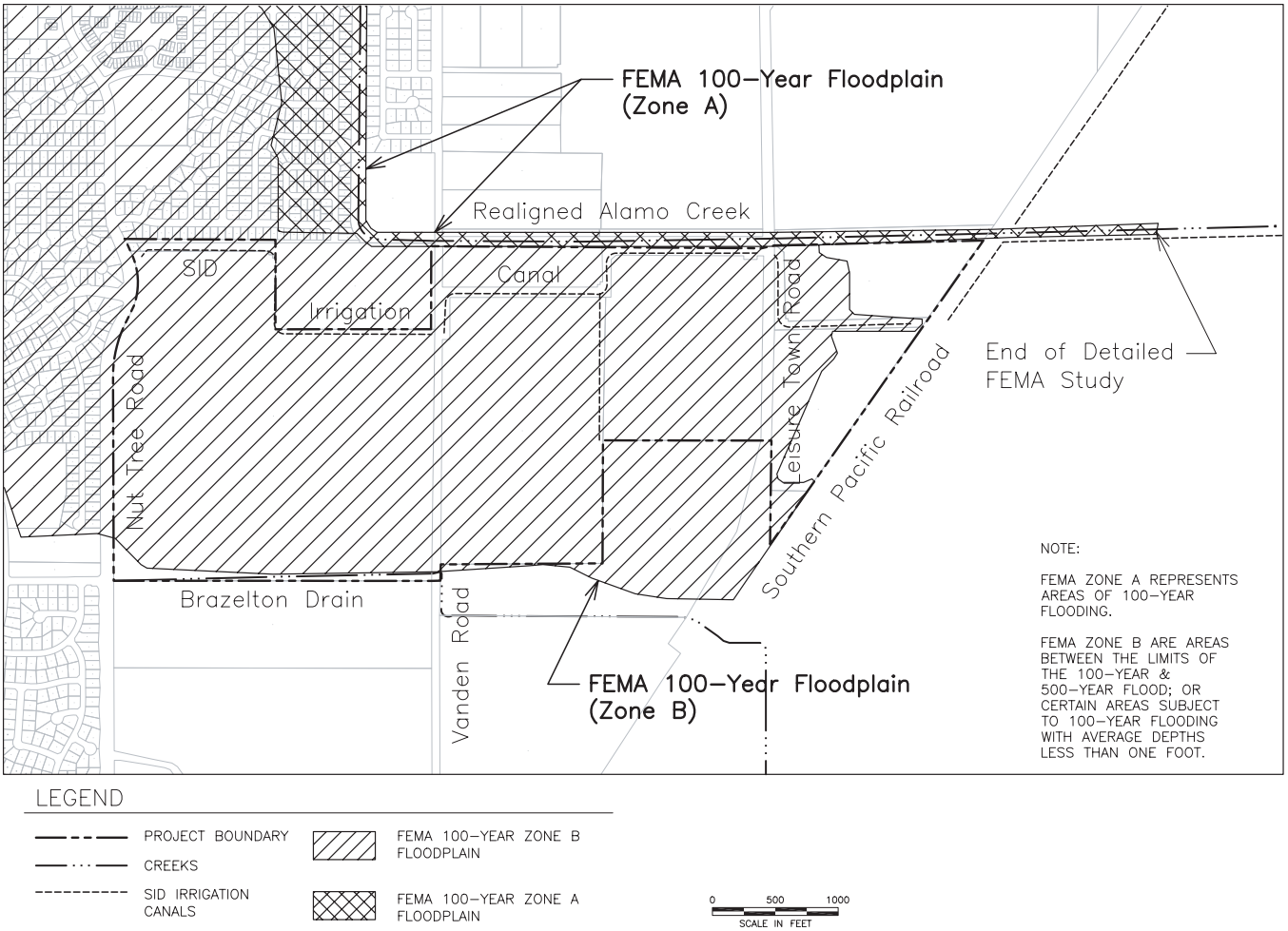
100-Year Floodplain

The 1996 revised Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Solano County shows that a significant portion of the Southtown Project site is located within the FEMA Zone B floodplain, as seen on Figure 3.12-2. The FEMA Zone B floodplain is described by FEMA as, "Areas between the limits of the 100-year flood and the 500-year flood; or certain area subject to 100-year flooding with average depths less than one foot; or areas protected by levees from the base flood."

Drainage

Regional Drainage

The major stream courses which flow through Vacaville are generally in their natural state and alignment. Under existing conditions, channel capacities are exceeded in isolated locations and localized flooding occurs during moderate storm events. In the 1960s, some reaches of the creeks located within the city were modified by the U.S. Soil Conservation Service (SCS –now the Natural Resources Conservation Service) to provide a 10-year level of protection and maintain a minimum freeboard of 1.5 to 3.5 feet (with the exception of the few reaches along Horse Creek and Ulatis Creek that were designed for a 50-year level of protection). The channel modifications consisted of realigning and widening along Ulatis, Lower Old Alamo, Horse Gibson Canyon, Sweeney, and McCune Creeks; the modification extended frtom Cache Slough to I-80. A new diversion channel was constructed on Alamo Creek downstream of Nut Tree Road. The new diversion channel runs along the northern boundary of the Southtown site. Other improvements included stabilization structures on Ulatis, Alamo, and Horse Creeks; and levees along lower Ulatis Creek and Old Alamo Creek.



Source: *West Yost Associates, 2003; adapted by Cotton/Bridges/Associates, 2003.*

Figure 3.12-2
100-Year Flood Areas

A majority of the natural streams in Vacaville are maintained by the adjacent property owners to the channel centerline. The City keeps the channel flowlines free from debris and vegetation. The Solano County Water Agency (SCWA) is responsible for maintenance of the modified channels. Future alteration to the modified channels requires authorization from SCS.

On-Site Drainage

Alamo Creek has significant overbanking problems under the current rate of runoff and surrounding land uses are exposed to flood hazards. Current City standards require that new development is protected from 100-year storms and provides facilities that accommodate localized runoff.

The Southtown site is currently used for crop production and has three residences scattered throughout the 290-acre site. The majority of the surface runoff that occurs within the site infiltrates into the soil. Surface elevation of the site is between approximately 100 feet above mean sea level on the west and approximately 85 feet above mean sea level on the east. Surface runoff currently flows from west to east within the site.

Water Quality

Sacramento Water Quality

The Sacramento River is classified as having numerous beneficial uses, including municipal water supply, agriculture, recreation, and fisheries. Water quality within the river is classified as "good" to "impaired" in the reach from Red Bluff to the Delta. Upstream water management and use can affect the quality of water in the river. Regulation of stream flows by the federal and State flood control and storage facilities reduce high water flows and increases summer and fall flows, substantially lessening water quality variations. Extensive irrigated agriculture in upstream reaches of the river tends to degrade water quality. During the spring and fall, irrigation return flows are discharged to drainage canals that flow into the river. During the winter, local runoff also flows over agriculture lands, increasing the turbidity in the river and introducing herbicides and pesticides. The Sacramento River has historically been highly turbid and naturally carries high sediment loads. During peak regional storm events, the river's total sediment load can increase by several times its average levels.

Local Water Quality

Water quality within the Ulatis Creek watershed is primarily influenced by the surrounding land uses. In the proposed Project area, the water quality of New Alamo Creek and the Brazelton Drain are heavily influenced by both agricultural and urban land uses. Downstream of the proposed Project site, water quality in the existing watercourses is affected by agricultural uses. Potential constituents of pollution associated with urban and agricultural land uses include sediment, heavy metals, petroleum hydrocarbons, fertilizers, and pesticides.

Urban Runoff Quality

Constituents found in urban runoff vary during a storm event, from event to event within a given area, and from area to area within a given watershed. Variances can be the result of differences in

rainfall intensity and occurrence, geographic features, and the land use of the area, as well as vehicle traffic and the percentage of impervious surface. Furthermore, sediment runoff from construction sites without adequate erosion control measures can contribute sediments, pesticides, fertilizers, and other pollutants to receiving waters.

In the Vacaville area, the natural weather pattern consists of a long dry period from May to October, and a wet season from November to April. During the seasonal dry period, pollutants contributed by vehicle exhaust, vehicle and tire wear, spills, and atmospheric fallout accumulates within the watershed. Precipitation during the early portion of the wet season displaces these pollutants into the storm water runoff that can result in elevated pollutant concentrations in the initial wet weather runoff.

Concentrations of heavy metals present in dry weather runoff (runoff during the dry season generated by landscape irrigation, street washing, etc.) are typically lower than concentrations measured in wet weather runoff (runoff generated during the rainy season primarily by precipitation). Some sources of dry weather runoff constituent pollutants include commercial and domestic irrigation, general wash-off, groundwater infiltration, and illegal discharges.

Regulatory Authority

There are a variety of regulatory agencies responsible for overseeing water quality, flooding, and hydrology issues within the State of California. Approval of projects requires consultation with several agencies, as well as consistency with the rules and regulations of each agency. Agencies with regulatory control over water quality issues within Solano County are shown below.

State and Regional Water Resources Control Boards

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) are responsible for ensuring implementation and compliance with the provision of the federal CWA and California's Porter-Cologne Water Quality Control Act. Along with the SWRCB and RWQCB, water quality protection is the responsibility of numerous water supply and wastewater management agencies, as well as city and county governments, and requires the coordinated efforts of these various entities.

The Project site is situated within the jurisdiction of the Central Valley Region of the SWRCB (Region 5). The Central Valley RWQCB (CVRWQCB) has the authority to implement water quality protection standards through the issuance of permits for discharges to water at locations within its jurisdiction. Because Alamo Creek eventually drains into the Sacramento River, water quality objectives for waterways in the Project area are specified in the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan), as prepared by the CVRWQCB. The most recent version of the Basin Plan is the Fourth Edition, dated 1998, was prepared in compliance with the provisions of the federal Clean Water Act and the State Porter-Cologne Water Quality Control Act.

The CVRWQCB will require that the Southtown Project comply with the provisions established by the National Pollutant Discharge Elimination System (NPDES) permit system, which regulates municipal and industrial discharges to surface waters of the U.S. Non-point pollution sources

originate over a wide area rather than from a definable point. Such non-point sources are generally exempt from federal NPDES permit program requirements with the exception of discharges caused by general construction activities and the general quality of stormwater in municipal stormwater systems. The goal of the NPDES nonpoint source regulations is to improve the quality of storm water discharged to receiving waters to the "maximum extent practicable" through the use of Best Management Practices (BMPs).

Compliance with the NPDES permit requires that any construction activity affecting one acre or more obtain a General Construction Activity Stormwater Permit. Permit applicants are required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and implement source control BMPs to reduce construction effects on receiving water quality by implementing erosion control measures.

Examples of construction BMPs identified in SWPPPs include: using temporary mulching, seeding or other stabilization measures to protect uncovered soils; storing materials and equipment to ensure that spills or leaks cannot enter the storm drain system or surface water; developing and implementing a spill prevention and cleanup plan, installing traps, filters, or other devices at drop inlets to prevent contaminants from entering storm drains; and using barriers, such as straw wattles or silt fencing, to minimize the amount of uncontrolled runoff that could enter drains or surface water.

Vacaville General Plan

The City's General Plan contains policies related to surface hydrology that would apply to the Southtown Project. The policies include:

> ***Policy 3.5-G 1***
> Maintain open spaces needed to retain storm water and prevent flooding of urban or agricultural land.
>
> ***Policy 3.5-I 6***
> Reserve stream-channel setbacks necessary for flood control.
>
> ***Policy 9.2-G 1***
> Locate development outside mapped flood-prone areas unless mitigation of flood risk is assured.
>
> ***Policy 9.2-G 2***
> Continue to develop a comprehensive system of drainage improvements to minimize flood hazards.
>
> ***Policy 9.2 G-3***
> The additional runoff caused by development shall be mitigated.
>
> ***Policy 9.2 I 2***
> Evaluate storm drainage needs for each project in the context of demand and capacity when the drainage area is fully developed. Continue to require Development Impact Fees for new development to construct planned regional drainage detention basins to accommodate increased flow. In the Alamo Creek watershed upstream of Peabody Road, which includes Alamo, Laguna, and Encinosa creeks, require post-development 10-year and 100-year peak flows to be reduced to 90 percent of predevelopment levels. For the remainder of the

> [General Plan area], for development involving new connections to the creeks, peak flows shall not exceed predevelopment levels for a 10- and 100-year peak flow.
>
> ***Policy 9.2-I 4***
> Assure through a Master Drainage Plan and development ordinances that proposed new development adequately provides for development of on-site and downstream off-site mitigation of potential flood hazards and drainage problems and require development fees to fund the required improvements.

City development standards require that new development provide for the proper storm drainage of all proposed lots and improvements, based on the runoff that can be anticipated from ultimate development of the watershed area in which the development project is located. In addition, new development must ensure that existing creeks and storms drains can accommodate the increased flows or the downstream drainage facilities must be improved to the point where they can accommodate the increased flows. This may require off-site improvements to existing creeks, channels, and/or storm drain pipes, or require the development to provide detention storage. Standard specifications for storm drainage improvements include regulations such as the minimum inside diameter of a storm drain pipeline is 15 inches. When development abuts a designated creekway, as in Alamo Creek immediately adjacent to the Southtown site, the city requires the developer to provide a paved flood control access road and repair of any damage to the channel. The city also charges projects a development impact fee, which provides funding for area-wide drainage facilities.

Methodology

Implementation of the Southtown Project will result in changes to the existing agriculture/vacant land use of the site to a combination of residential, commercial, park, and public facility land uses. The change in land use will result in alterations to surface runoff during a storm event such as changes in infiltration of incident rainfall as well as an increase in the concentration of runoff entering conveyance facilities such as gutters and underground storm drain pipes. Typically, an increase in the amount of impervious surface area resulting from a change in land use will result in higher runoff that flows faster within gutters and drain pipes than overland flow of surface runoff within undeveloped land.

The proposed Project has been evaluated through the use of a hydrologic computer model using the HEC-1 computer program (See Appendix F). The computer model methodology is consistent with the approach used in the City's Draft Storm Drainage Master Plan study, except that the rainfall data was updated based on the rainfall data contained in the Solano County Water Agency Hydrology Manual. The analysis is based on approximate assumed acreages for the different land uses in the proposed Project area.

Impacts to water quality were evaluated qualitatively by comparing existing versus future land uses and assessing the increase in flows to the receiving waters. The proposed Project may result in degradation of storm water quality during and after construction. However, the potential degradation can be addressed by the implementation of suitable mitigation measures.

Thresholds of Significance

Impacts would be considered significant if the Project would:

- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Violate any water quality standards or waste discharge requirements or substantially degrade water quality;
- Substantially alter the existing drainage pattern in a manner that would either result in substantial erosion or siltation on- or off-site, or increase the rate or amount of surface runoff resulting in flooding on- or off-site;
- Create or contribute runoff that would exceed the capacity of existing or planned stormwater drainage systems;
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows; or,
- Expose people or structures to a significant risk of loss, injury, or death involving flooding.

Environmental Impact and Mitigation Measures

Impact HYDRO-1 Require New and/or Expanded Storm Drain Facilities

Anticipated Surface Runoff and Storm Drain Capacity

Development of the proposed Southtown Project is expected to produce higher peak flows of storm water runoff than is produced under existing conditions. The introduction of impervious surface area proposed by the Project could generate a potentially significant volume of surface runoff. As designed, the Project includes the construction of internal storm drain facilities that will result in the collection of surface runoff within the streets and into a system of underground piping to concentrate and convey the surface runoff more efficiently.

However, as seen in Table 3.12-1, the results of the HEC-1 model analysis, which indicated that the peak flows anticipated from the proposed Project would be about 1.3 to 2.0 times higher than the peak flows under the existing conditions.

Table 3.12-1
Comparison of Modeled Discharges for the 100-Year Storm

Drainage Subshed Designation	Modeled Discharge [A]	
	Existing Condition	With Project Condition
Brazelton Drain [B]		
Nut Tree Road (BD1-10) [C]	390	390
Vanden Road (BD11)	615	780
Leisure Town Road (BD12)	780	1,080
Alamo Creek [D]		
MDY3	36	75

A – Measured in cubic feet per second.
B – Total estimated flow in the Brazelton Drain.
C – Existing buildout of the Foxboro Meadows development located west of Nut Tree Road
D – Discharge into Alamo Creek near the railroad from the Moody property.

Source: West Yost Associates, September 2003

As seen in Figure 3.12-3, the major existing storm drain facilities within the Project area are the Brazelton Drain, located along the southern boundary of the site, and the realigned Alamo Creek, located along the northern boundary of the Project site. There are no internal storm drain facilities within the Project site boundaries.

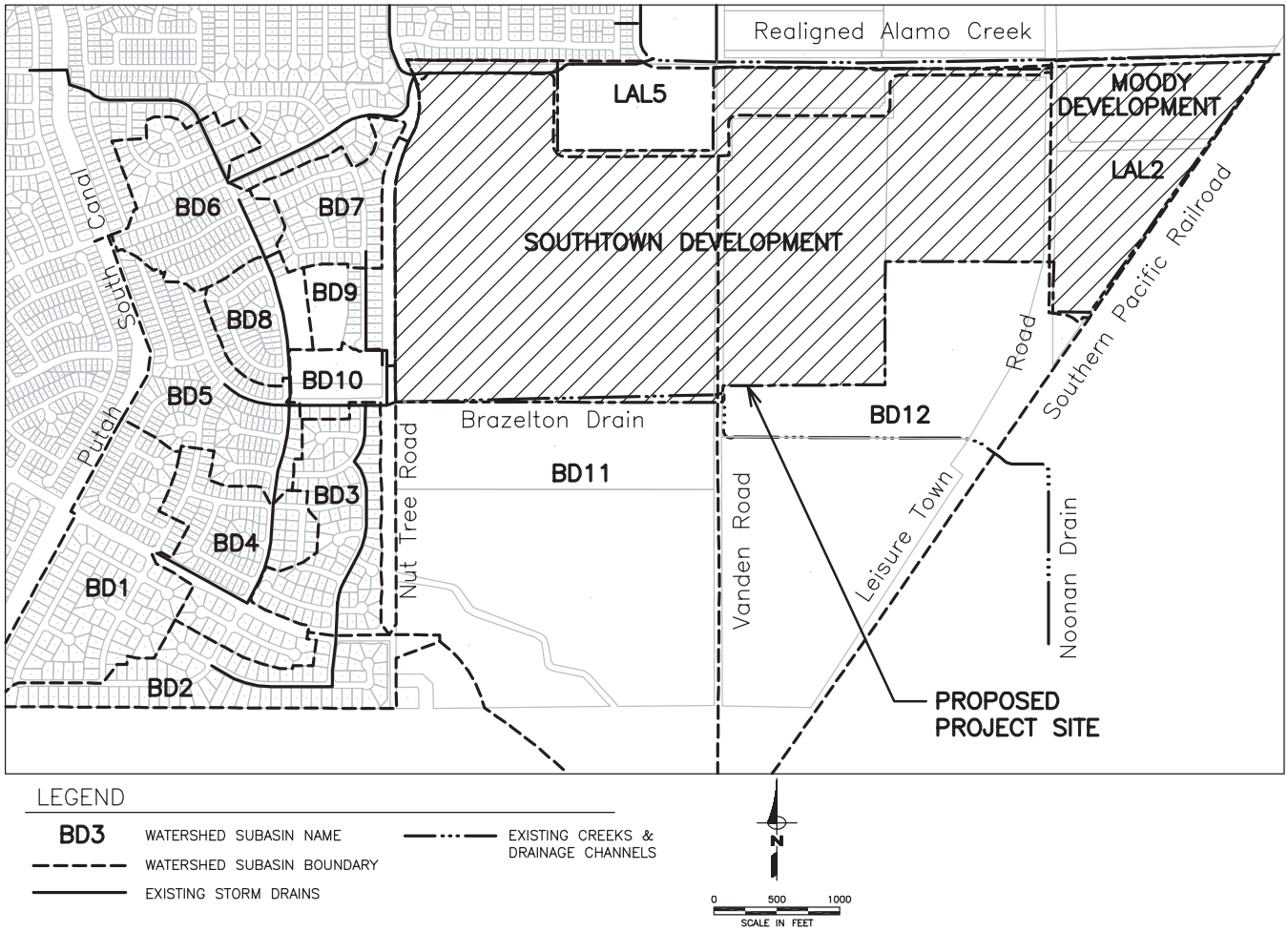
As proposed, the Southtown Project includes the construction of an internal storm drainage conveyance system generally consisting of catch basins, manholes, and gravity flow pipes located throughout the Project site as required. Figure 3.12-4 shows the storm drain improvements proposed by the Southtown Project.

Surface runoff collected within the portion of the Project site located between Nut Tree Road and Leisure Town Road will be routed south to Vanden Road. Surface runoff from the existing Foxboro Meadows area, located west of Nut Tree Road, will be conveyed via a large diameter pipeline from Nut Tree Road to Vanden Road. The proposed large diameter storm drain will replace a portion of the existing open channel known as the Brazelton Drain, located along the southern boundary of the Southtown site, from Nut Tree Road to Vanden Road. Eventually, surface runoff flows from the Southtown Project site and the Foxboro Meadows development will combine at Vanden Road and will then be conveyed to the Brazelton Drain via multiple storm drains. As part of the Southtown Project, the Brazelton Drain will be widened and improved to function as a linear type detention basin from Vanden Road to Leisure Town Road (See Figure 3.12-4). The proposed location for the improvements to the Brazelton Drain to accommodate a linear detention basin are off-site and not currently controlled by the project proponent. Two large on-site detention basins will be constructed if control of the Brazelton Drain east of Vanden Road cannot be obtained.

Surface runoff collected within the Moody portion of the Project site, between Leisure Town Road and the railroad tracks will be routed north to a proposed regional detention basin adjacent to Alamo Creek. The City's Storm Drainage Master Plan Update (April 2001) identified the area near Leisure Town Road and Alamo Creek as a potential location for a regional detention basin to mitigate for increased runoff resulting from development within the Alamo Creek Watershed. The detention basin is anticipated to be between 7 to 10 acre-feet in size and will be designed to retain most of the runoff from this portion of the Project site until peak flows in Alamo Creek have receded.

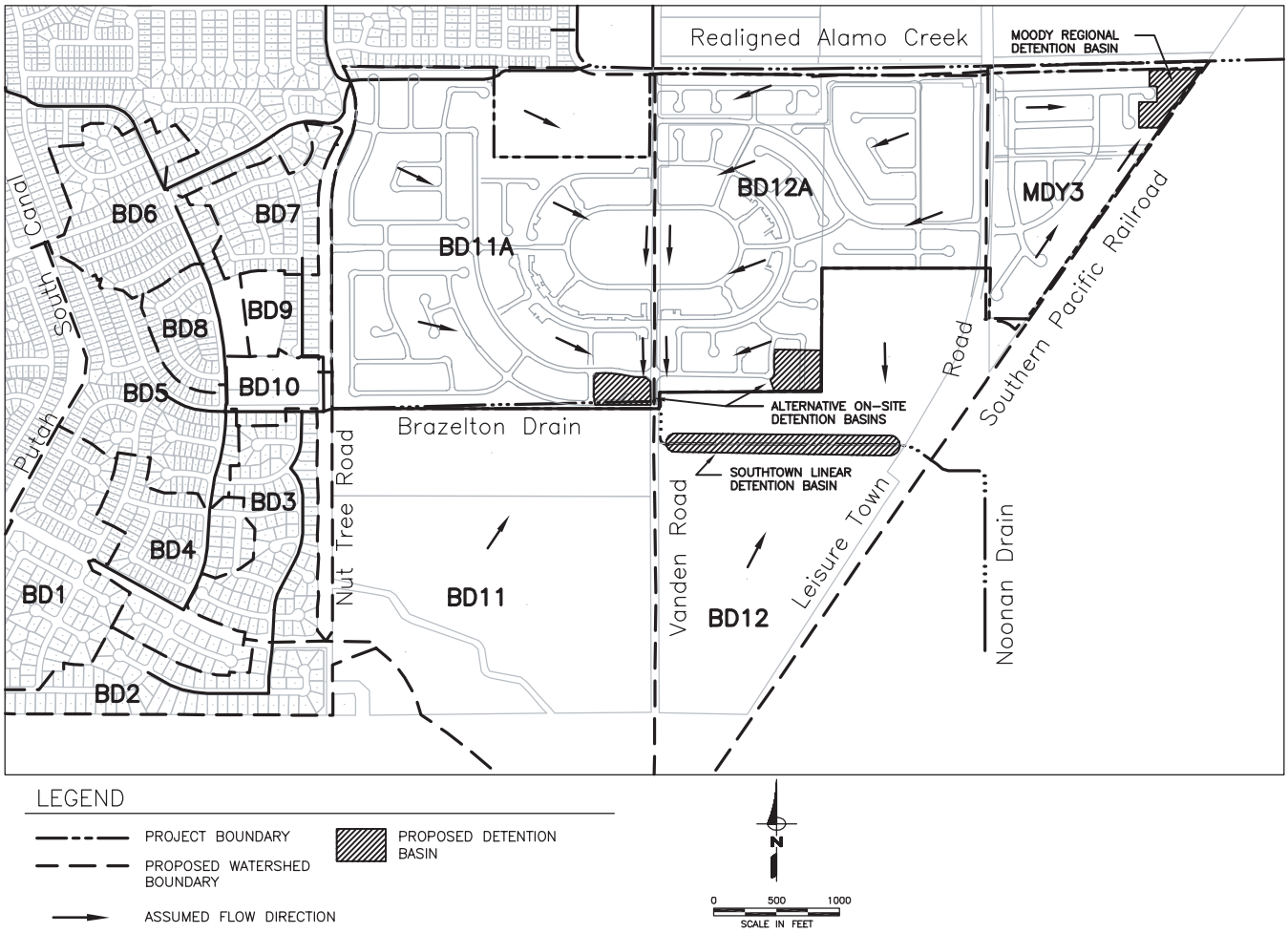
Detention basins and related drainage facilities will be required to mitigate for the increase in surface runoff during 10- and 100-year storm events. Detention basins shall be designed such that the peak flow discharging from the Project site does not exceed the predevelopment levels for the 10- and 100-year peak flows. In addition, storm drain pipelines shall be designed to convey the 10-year peak flows in accordance with City design standards. Brazelton Drain improvements shall be designed to convey the 100-year peak flows.

Without mitigation, this is a **potentially significant** impact.



Source: *West Yost Associates, 2003; adapted by Cotton/Bridges/Associates, 2003.*

Figure 3.12-3
Existing Drainage Facilities



Source: *West Yost Associates, 2003; adapted by Cotton/Bridges/Associates, 2003.*

Figure 3.12-4
Planned On-Site Drainage Facilities

Mitigation Measure HYDRO-1a

A Storm Drain Master Plan (SDMP) shall be prepared by a registered civil engineer prior to approval of the Tentative Map. The SDMP shall include the following:

- **Maps showing the location of existing and proposed drainage facilities, the watershed boundaries, location of analysis points, and overland release paths**
- **Preliminary pipe sizes and/or typical channel geometry with hydraulic grade lines, invert, and proposed ground elevations at analysis points**
- **Design flows (10- and 100-year) at key analysis points**
- **Preliminary grading plan and layout of proposed detention basins**
- **Stage, storage, and discharge information for detention basins for selected design storms**
- **Description of storage requirements, operation, and maintenance of detention facilities**
- **Description and analysis of any necessary water quality features**

Mitigation Measure HYDRO-1b

The proposed Project shall include drainage improvements and detention basins designed to accommodate 10- and 100-year flows. Detention facilities shall be adequate to limit discharges from the proposed Project such that peak flows do not exceed peak flows experienced under existing conditions. The detention facilities shall be designed to the City's Design Standards and will include provisions to ensure draining during high flows in the main channels and to prevent increased flows downstream due to the occurrence of simultaneous peak flows from upstream.

With incorporation of the preceding mitigation measures, impacts related to storm drain facility capacity will be **less than significant**.

Sediment Loading

Because the Project site is relatively flat, the proposed storms drains may not be able to maintain the City's minimum velocity criteria, as seen within some recent development projects. Minimum velocity requirements are established to prevent sediment from accumulating in the conveyance facilities, such as pipes and channels. When minimum velocities are not achieved there is a potential to increase the sediment accumulation within the storm drain system, which results in an increased need for maintenance activities as well as the potential failure of the drainage facilities.

The proposed Southtown Project anticipates modifying the Brazelton Drain from Vanden Road to Leisure Town Road to function as a linear type detention basin. To create the detention basin, the velocities within the channel will have to be reduced considerably. The Brazelton Drain conveys runoff for several hundred acres and substantially reducing the channel velocity will increase sediment loading within the Brazelton Drain. Increased sediment loadings will decrease the channel capacity and potentially increase flooding upstream of the proposed detention basin. If left unmitigated, this impact would be considered **potentially significant**.

Mitigation Measure HYDRO-1c

The proposed storm drain pipes shall be designed to maintain a minimum velocity of 2.5 feet per second. If the minimum velocity criterion is not maintained then the Project proponent(s) shall

setup a maintenance benefit district that will provide the funding necessary to offset the additional maintenance costs.

Mitigation Measure HYDRO-1d

The design of the proposed Brazelton Drain linear detention basin shall ensure the proposed facilities will both adequately convey the 10- and 100-year design storms and provide the required detention to attenuate the peak flows to pre-development levels. The Project proponent shall establish maintenance agreements and funding mechanisms to ensure the linear detention basin is maintained and that accumulated sediment is removed.

Following implementation of the mitigation measures identified above, impacts related to storm drain facilities are considered **less than significant**.

Impact HYDRO-2 Stormwater Runoff Impacts on Water Quality

Implementation of the proposed Project is expected to increase the peak surface runoff rates from the existing conditions, which could potentially result in increased erosion as well as levels of sedimentation. The anticipated conversion of agricultural uses to urban land uses will likely increase the concentration of contaminants associated with urban areas in the runoff. For example, development of the Project will result in an increase in vehicular traffic on surrounding roadways and within new parking areas. It is expected that there will be a corresponding increase in roadway contaminants such as oil, grease, and heavy metals in surface runoff within the Project vicinity. Other urban contaminants, such as fertilizers and pesticides, would be discharged from landscaped areas. These urban contaminants will be carried within the surface runoff and discharged into the Brazelton Drain and Alamo Creek resulting in adverse impacts to receiving water quality.

Construction activities involving soil disturbance, excavation, cutting/filling, stockpiling, and grading could potentially impact receiving water quality. During a storm event, the sediment load of surface runoff flowing over disturbed soils increases, resulting in additional erosion of the site surface. There is also the potential that construction materials such as asphalt, concrete, and equipment fluids could be exposed to rainfall, which would result in contaminated surface runoff and adverse impacts to receiving water quality.

Any significant construction project within the State of California requires preparation of a Storm Water Pollution Prevention Plan (SWPPP) to comply with the requirements of the State Water Resources Control Board NPDES General Permit. The best management practices identified in the SWPPP would help mitigate for the impact related to construction activities and post construction activities on storm water quality. In addition, under the NPDES Phase II rule, the Project is also required to develop a Storm Water Management Program (SWMP) to protect surface waters from adverse water quality associated with surface runoff and post construction activities. Compliance with the SWMP would minimize any impact of development on storm water quality. If left unmitigated, this impact would be considered **potentially significant**.

Mitigation Measure HYDRO-2a

Since the proposed Project will disturb more than one acre of soil, preparation of a Storm Water Pollution Prevention Plan (SWPPP) will be required by the Regional Water Quality Control Board under the NPDES General Permit for Discharges of Storm Water Associated with Construction Activity. Prior to the start of construction, a SWPPP shall be prepared to address water quality impacts associated with construction of Project facilities and roadways. The Project Proponent shall incorporate into construction contract specifications the requirement that all contractors comply with and implement the provisions of the SWPPP. The objectives of the SWPPP are to identify pollutant sources that could affect the quality of stormwater discharge, to implement control practices to reduce pollutants in stormwater discharges, and to protect receiving water quality.

Mitigation Measure HYDRO-2b

A comprehensive storm water management plan (SWMP) shall be prepared by a registered civil engineer or registered professional hydrologist for the Project and for approval by the City prior to submittal of local improvements plans. Provisions of the SWMP shall focus on the protection of water resources from Project-generated adverse impacts to surface runoff to the maximum extent practicable, identifying both construction and programmatic Best Management Practices as required.

Depending on the design of the storm drain improvements required to serve the Project, some surface runoff pollutants could be removed through sedimentation and biological removal. Following incorporation of the mitigation measures identified above, impacts related to the water quality resulting from development of the proposed Project are considered **less than significant**.

Impact HYDRO-3 Substantially Alter the Existing Drainage Pattern

Development of the Southtown Project site will alter the existing drainage pattern through the change in land use and introduction of impervious surfaces into the area. However, as discussed above, the Project includes storm drain facilities west of the Project site that have been designed to accommodate anticipated surface runoff flows from within the site as well as within the Foxboro Meadows development. With incorporation of mitigation measures cited under Impact HYDRO-2, the impact is **less than significant**.

Impact HYDRO-4 Increase Runoff to Exceed Existing and/or Future Storm Drain Capacity

The Project includes the construction of various storm drain improvements that will be sized in accordance with the anticipated surface runoff throughout the drainage area. These improvements are identified and discussed under Impact 1 above. Impacts are considered **less than significant**.

Impact HYDRO-5 Place Structures in 100-Year Flood Hazard Zone

As seen in Figure 3.12-2 above, a significant portion of the Southtown Project site is located within the FEMA Zone B floodplain. The 100-year water levels in Alamo Creek are estimated to be near the existing ground surface elevations within the Project site. The potential for flooding is considered significant if the proposed Project includes pad elevations that would be lower than the 100-year water levels in Alamo Creek. Furthermore, future Flood Insurance Studies may indicate that any pad grades proposed by the Project that are lower than the current 100-year water levels estimated for Alamo Creek could potentially be included within the 100-year floodplain. If left unmitigated, this impact would be considered **potentially significant**.

Mitigation Measure HYDRO-5a

The finish floor elevations within the proposed Project shall be one foot above the estimated Zone B floodplain elevations, or show that the 100-year storm event will not reach any pads.

Mitigation Measure HYDRO-5b

The proposed pad elevations shall be above the FEMA 100-year water levels estimated for Alamo Creek.

Following implementation of the mitigation measures above, impacts related to the 100-year flood zone are considered **less than significant**.

Impact HYDRO-6 Increased Runoff Leading to On-site, Localized, or Downstream Flooding

The proposed Project will result in an increase in impervious surface area within the currently vacant/agriculture Project site. The resulting alteration in drainage patterns across the Project area is expected to increase and thereby, potentially reroute surface runoff. Currently, there is not a significant quantity of drainage improvements within the Project site, which could significantly increase the potential for on-site flooding. The Project includes the construction of an internal storm drain system comprised of curbs and gutters, inlets, underground pipelines, as well as detention basins and offsite improvements as needed.

As seen in Figure 3.12-3, a parcel located along the northern boundary of the proposed Southtown Project and immediately south of Alamo Creek is not included in the proposed development. Currently, this parcel drains from west to east to Vanden Road and then drains north to Alamo Creek. In order to alleviate the potential for localized flooding resulting from the exclusion of this parcel from current development, the City has requested that provisions are made to allow this parcel to drain to the south through the Southtown Project and into the Brazelton Drain. If left unmitigated, this impact would be considered **potentially significant**.

Mitigation Measure HYDRO-6a

The proposed Project shall be designed such that the building pads are raised and overland flows can be safely conveyed through the Project site to an existing receiving channel such as Alamo Creek or the Brazelton Drain or to one of the proposed detention facilities.

Mitigation Measure HYDRO-6b

The proposed storm drain improvements included as part of the Southtown Project shall provide sufficient capacity within the facilities to collect and convey runoff under anticipated developed conditions from the area north of the Southtown site and south of Alamo Creek.

3.13 Transportation

This section examines the potential traffic circulation impacts resulting from operation of the Project. Impacts related to traffic congestion and emergency access are assessed. A study of transportation impacts was conducted for the Project (see Appendix H). The study addresses impact of Project traffic on area roadways. Additionally, this section addresses access issues and parking.

Environmental Setting

The Project is located southeast of the city of Vacaville, near the incorporated boundary, in an area where recent residential development has occurred.

Local Roadway Network

Local access to the site is provided primarily via Alamo Drive, Vanden Road, Leisure Town Road, and Nut Tree Road. Regional access is provided by Interstate 80 (I-80), Interstate 505 (I-505), Leisure Town Road, and Alamo Drive (refer to Figure 3.13-1). Primary access to the Project site is proposed on Leisure Town Road, which is a main north-south roadway in the eastern portion of the city. Leisure Town Road is planned as a four-lane, median-divided street, and will include a sidewalk on the west side and a sidewalk/bike path on the east side. The local roadway network is further described in Table 3.13-1.

Table 3.13-1
Project Vicinity Road Network

Roadway	Orientation	Number of Lanes	Pedestrian/Bicycle Facilities	Speed Limit
I-80	SW to NE	4 mixed-flow lanes in each direction	N/A	55 to 65
I-505	N to S	2 mixed-flow lanes in each direction	N/A	55 to 65
Alamo Dr.	E to W	2 lanes in each direction	Yes	40
Leisure Town Rd.	N to S	4 lanes from I-80 to Alamo Dr., 2 lanes from Alamo Dr. to Vanden Rd.	I-80 to Alamo Dr.	40
Nut Tree Rd.	N to S	2 lanes in each direction	Sidewalks are provided throughout this roadway	40
Vanden Rd.	N to S	2 lanes from Alamo Dr. to Cannon Rd.	No	40

The traffic analysis conducted to support this EIR focuses on the following 11 existing intersections (Figure 3.13-1)

1. Alamo Drive/Leisure Town Road/Fry Road
2. Alamo Drive/Vanden Road
3. Alamo Drive/Nut Tree Road
4. Alamo Drive/Peabody Road
5. Alamo Drive/I-80 Eastbound On-Ramp
6. Alamo Drive/Merchant Street
7. Vanden Road/Leisure Town Road
8. Leisure Town Road/I-80 Eastbound Ramps
9. Leisure Town Road/Vaca Valley Parkway/I-80 Westbound Ramps
10. Vanden Road/Cannon Road
11. Vanden Road/North Gate Road

Additionally, the seven project intersections were evaluated:

1. Nut Tree Road/Collector C
2. Vanden Road/Collector A
3. Vanden Road/Collector B
4. Vanden Road/Collector C
5. Vanden Road/Collector D
6. Leisure Town Road/Collector E
7. Leisure Town Road/Collector C

Segment analysis was conducted for the following roadway segments:

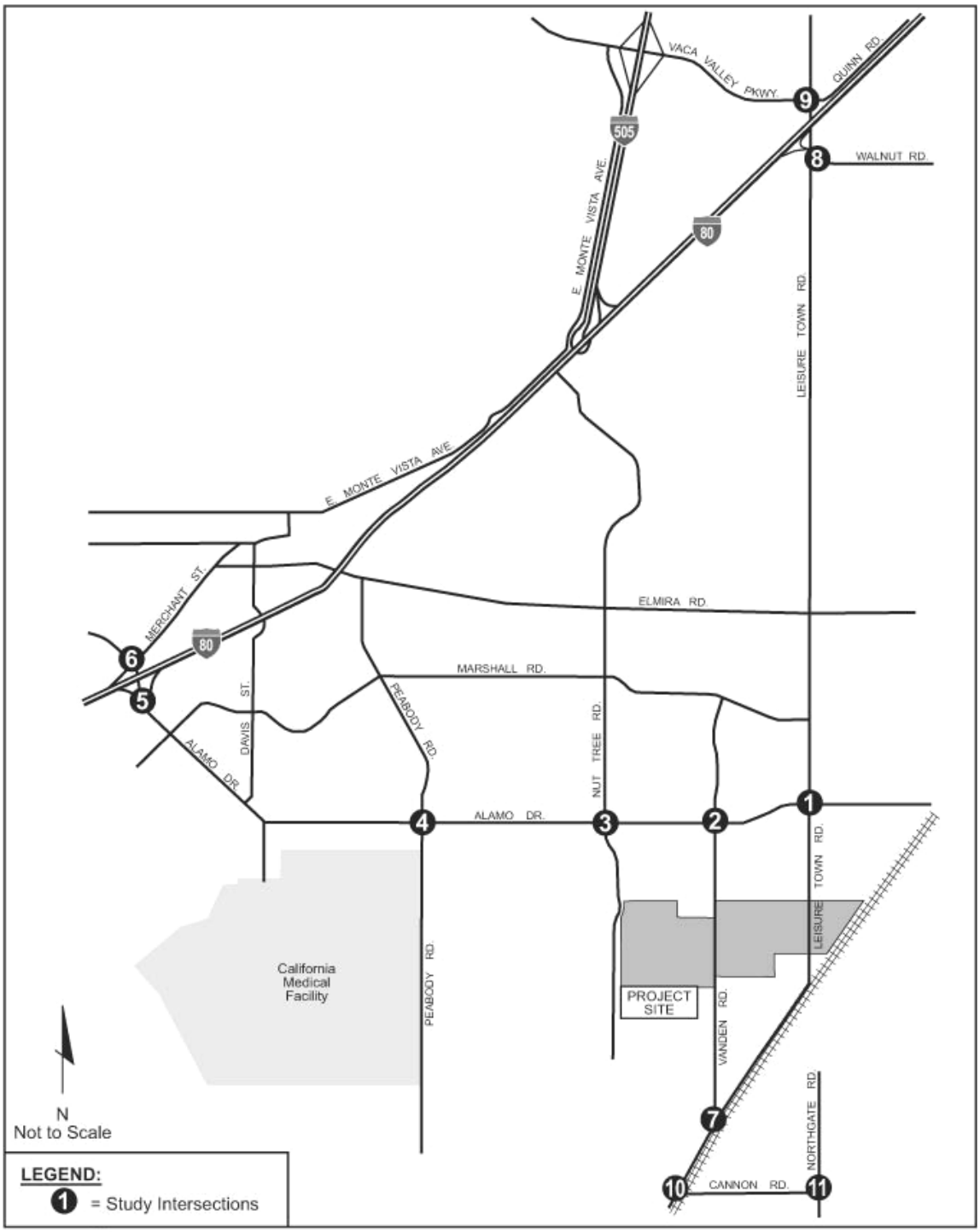
- ***Alamo Drive***
  West of Nut Tree Road
  Nut Tree Road to Vanden Road
  Vanden Road to Leisure Town Road
  East of Leisure Town Road

- ***Nut Tree Road***
  South of Collector C (With Project)
  Collector C to Alamo Drive (With Project)
  North of Alamo Drive

- ***Vanden Road***
  South of Leisure Town Road
  Leisure Town Road to Collector C (With Project)
  Collector A to Collector B (With Project)
  Collector A to Alamo Drive (With Project)

- ***Leisure Town Road/Jepson Parkway***
  Vanden Road to Collector C (With Project)
  Collector C to Collector E (With Project)
  Collector E to Alamo Drive (With Project)
  North of Alamo Drive

Figure 3.13-1
Study Intersections



Source: Fehr & Peers Associates, 2003.

Methodology

Roadway operating conditions can be described by comparing traffic volumes during peak hours to roadway capacity. In an urban setting, roadway capacity is a function of intersection characteristics. Roadway operating conditions can be described using definitions of levels of service (LOS). LOS is a qualitative measure of the effect of a number of factors, including speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs. LOS is designated A through F from best to worst, covering the entire range of traffic operations that might occur. LOS A through E generally represents traffic volumes at less-than-roadway capacity, while LOS F represents over capacity and/or forced flow conditions.

The traffic analysis for the Project followed guidelines established by the City of Vacaville. Traffic impacts were evaluated using intersection level of service (LOS) calculations for the evening (P.M.) peak hour. The morning (A.M.) peak hour was also evaluated for I-80 ramp intersections.

The signalized intersection LOS calculations used the V/C (Volume-to-Capacity Analysis) software, which uses the Intersection Capacity Utilization (ICU) method for capacity analysis. Table 3.13-2 presents the LOS criteria for signalized intersections, which is based on the V/C ratio.

Table 3.13-2
Signalized Intersection Level of Service Definitions Using V/C Ratio

Level of Service	Description of Traffic Conditions	V/C Ratio
A	Operations with very slight delay, with no approach phase fully utilized.	0.00 – 0.60
B	Operations with slight delay, and an occasional approach phase is fully utilized.	0.61 – 0.70
C	Operations with average delay. Individual cycle failures begin to appear.	0.71 – 0.80
D	Operations with tolerable delay. Many vehicles stop and individual cycle failures are noticeable.	0.81 – 0.90
E	Operations with high delay, up to several signal cycles. Long queues form upstream of intersection.	0.91 – 1.00
F	Operation with excessive and unacceptable delays. Volumes vary widely depending on downstream queue conditions.	> 1.00

Source: Intersection Capacity Utilization (ICU) method for capacity analysis.

The unsignalized intersection LOS calculations were analyzed using the Highway Capacity Software (HCS) Version 4.1, which is based on the *2000 Highway Capacity Manual* (HCM). HCM LOS criteria were utilized for unsignalized intersections (Table 3.13-3).

Table 3.13-3
Unsignalized Intersection Level of Service Criteria

Level of Service	Average Control Delay (seconds/vehicle)	Description
A	0 – 10	Little or no delay
B	> 10 – 15	Minor delays
C	> 15 – 25	Average delays
D	> 25 – 35	Moderate delays
E	> 35 – 50	Lengthy delays
F	> 50	Excessive delays/gridlock

Source: *Highway Capacity Manual* - Transportation Research Board, 2000.

Roadway link capacity analysis at the study segments of Alamo Drive, Nut Tree Road, and Vanden Road was performed using the roadway capacities of different classifications taken from the City of Vacaville's 1990 General Plan. Table 3.13-4 lists the peak hour traffic capacities for various facility types corresponding to LOS C, LOS D, as well as the maximum directional capacity.

Table 3.13-4
Peak Hour Roadway Capacities

Two-Way LOS C Capacity[1] (vph)	Facility Type	LOS C Directional Capacity[2] (vph)	LOS D Directional Capacity[3] (vph)	Maximum Directional Capacity[4] (vph)
12,000	8-Lane Freeway	7,200	8,100	9,000
8,000	6-Lane Freeway	4,800	5,400	6,000
4,500	6-Lane Divided Arterial	2,700	3,038	3,375
3,500	4-Lane Divided Arterial	2,100	2,363	2,625
2,500	4-Lane Undivided Arterial	1,500	1,688	1,875
1,500	2-Lane Arterial	900	1,013	1,125
1,000	2-Lane Collector	600	675	750

Notes:

vph = vehicles per hour

1. Two-way capacity is based on Figure 6-1 shown in the City of Vacaville 1990 General Plan.
2. LOS C directional capacity represents the capacity for one direction of the facility. This capacity is assumed to be 60% of the two-way LOS C capacity.
3. LOS D directional capacity represents the capacity for one direction of the facility. This capacity is assumed to be 90% of the maximum directional capacity.
4. The maximum directional capacity represents LOS E operations, which is LOS C directional capacity divided by 80%.

Source: City of Vacaville's 1990 General Plan.

Traffic analysis addressed the following scenarios:

Scenario 1, Existing Conditions. This includes existing volumes obtained from new traffic counts and counts available on City files.

Scenario 2, Existing plus Approved Projects. This scenario includes existing volumes plus traffic from approved projects not yet constructed in the general vicinity of the Project. This scenario uses the Vacaville Citywide MINUTP model files.

Scenario 3, Existing plus Approved Projects with Project. This includes traffic volumes from Scenario 2 plus traffic generated by the proposed Project.

Scenario 4, Year 2025 without Project. This scenario addresses traffic in 2025, using traffic volumes included in the Vacaville Citywide MINUTP model files. The Citywide year 2025 traffic model includes area development consistent with the City of Vacaville 1990 General Plan without development of the project area.

Scenario 5, Year 2025 without Project with California Drive Overcrossing. This analysis includes 2025 traffic volumes assuming an overcrossing of I-80 at California Drive. As with Scenario 4, the traffic model includes area development consistent with the City of Vacaville 1990 General Plan without development of the project area.

Scenario 6, Year 2025 with the Project with California Drive Overcrossing. This uses the same traffic volumes as Scenario 5 plus traffic generated by the proposed Project.

Scenario 7, Year 2025 with Alternate Project. This scenario uses traffic volumes from Scenario 5 plus traffic generated by an alternative project. This alternative includes residential development at a rural/estate density with a maximum of 891 single-family homes without any commercial component, and without any multi-family residential development. Alternatives are more fully described in Section 4.0 of this EIR.

Scenario 8, Year 2025 with Build-Out of Existing General Plan Land Use. Traffic volumes from Scenario 5 plus traffic generated by build-out of land use designations under the current General Plan without amendments proposed to accommodate the Project. The alternative project assumes a rural/estate density residential development of the Project site. This alternative also includes two elementary schools and two City parks, as envisioned by the General Plan.

Existing Traffic Volumes

Evening peak hour turning movement counts were conducted in September and October of 2002 from 4:00 P.M. to 6:00 P.M., and are summarized in Figure 3.13-2. Morning peak hour turning movement counts were conducted from 7:00 A.M. to 9:00 A.M in June of 2003. The large majority of intersections studied have traffic signal control (Figure 3.13-3). However, the intersections of Cannon Road with Vanden Road and North Gate Road are controlled with stop signs. All study intersections operate at LOS C or better during the A.M. and P.M. peak hour (Table 3.13-5).

Table 3.13-5
Existing A.M. and P.M. Peak Hour Intersection Level of Service Analysis

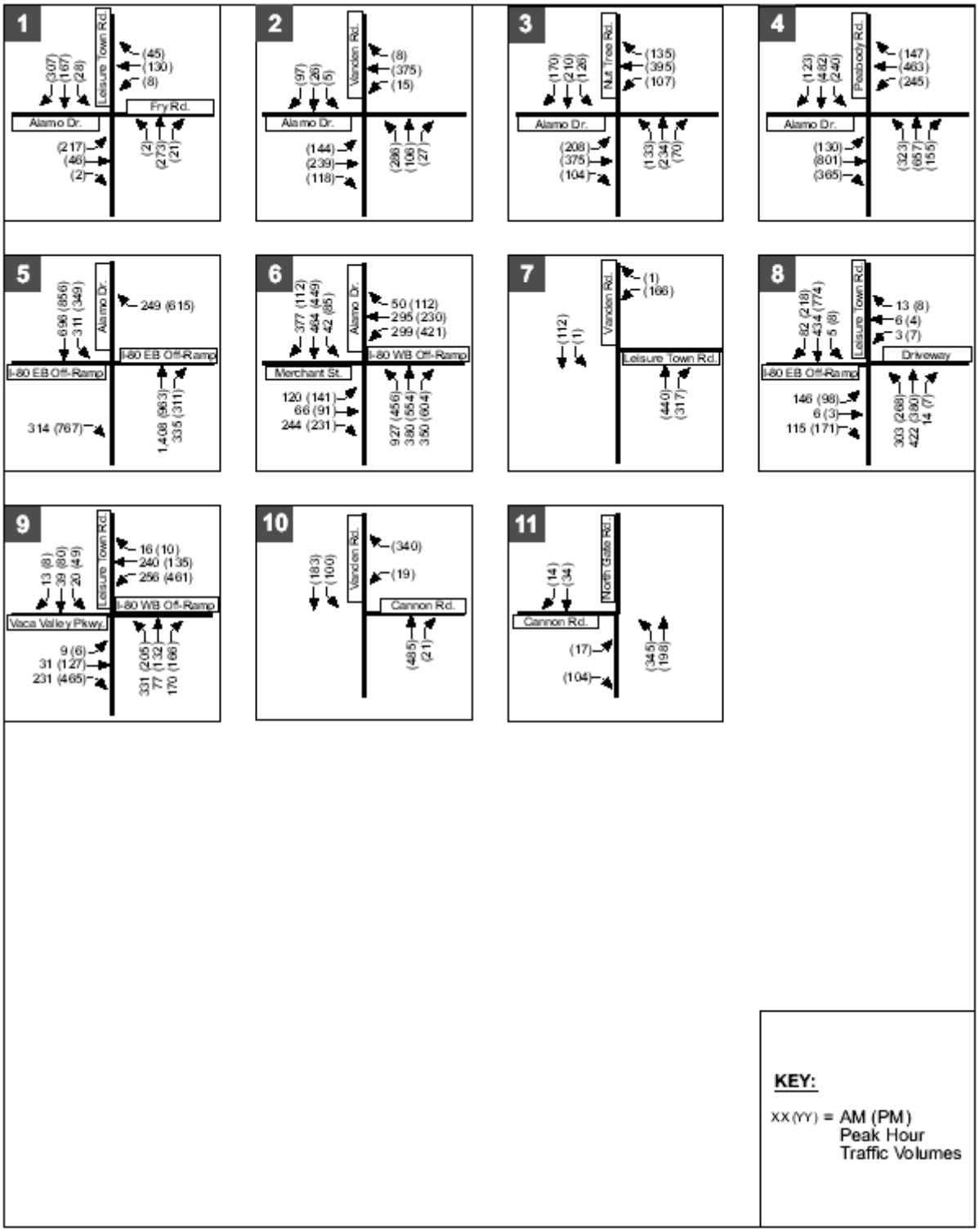
Intersections	Peak Hr.	Volume/ Capacity Ratio[1]	LOS
Signalized Intersections [2]			
1. Alamo Dr. / Leisure Town Rd. / Fry Rd.	P.M.	0.68	B
2. Alamo Dr. / Vanden Rd.	P.M.	0.72	C
3. Alamo Dr. / Nut Tree Rd.	P.M.	0.61	B
4. Alamo Dr. / Peabody	P.M.	0.68	B
5. Alamo Dr. / I-80 EB On-Ramp	A.M.	0.64	B
	P.M.	0.52	A
6. Alamo Dr. / Merchant St.	A.M.	0.79	C
	P.M.	0.62	B
7. Vanden Rd. / Leisure Town Rd.	P.M.	0.48	A
8. Leisure Town Rd. / I-80 EB Ramps	A.M.	0.57	A
	P.M.	0.67	B
9. Leisure Town Rd. / Vaca Valley Pkwy / I-80 WB Ramps	A.M.	0.53	A
	P.M.	0.78	C
Unsignalized Intersections			
10. Vanden Rd. / Cannon Rd. [3]	P.M	19.9	C
11. Cannon Rd. / North Gate Rd. [4]	P.M.	14.2	B

Notes:

1. Volume-to-capacity (V/C) for signalized intersections and average delay per vehicle in seconds per vehicle for unsignalized intersections.
2. Signalized intersection level of service based on sum of V/C for critical movements for each approach for the intersection, according to the *Interim Materials on Highway Capacity Manual*, Circular 212, Transportation Research Board, 1980.
3. Side-street stop-controlled intersection LOS is based on average control delay (seconds per vehicle) for the worst case stop-controlled movement according to the *Highway Capacity Manual*, Transportation Research Board, 2000.
4. All-way stop-controlled intersections LOS is based on average delay per vehicle (in seconds) according to the *Highway Capacity Manual*, Transportation Research Board, 2000.

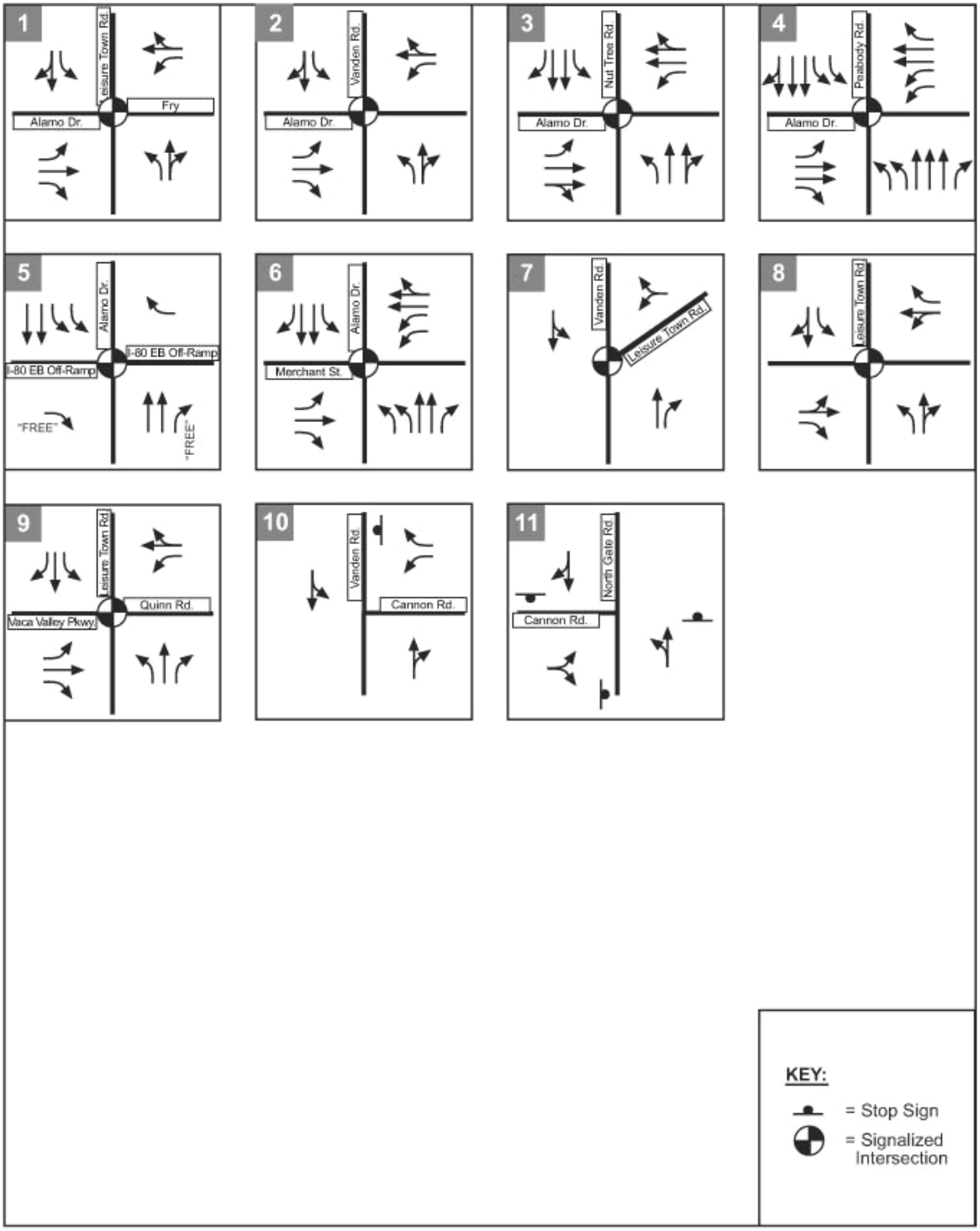
Source: Fehr & Peers, 2003.

Figure 3.13-2
Existing Peak Hour Turning Movements



Source: Fehr & Peers Associates, 2003.

Figure 3.13-3
Lane Configurations and Traffic Control Devices



Source: Fehr & Peers Associates, 2003.

All roadway segments operate at LOS C or better under existing baseline conditions (Table 3.13-6):

Table 3.13-6
Existing P.M. Peak Hour Roadway Capacities

Roadway	Segment	Calculated LOS C Directional Capacity[1] (vph)	Peak Direction Volume (vph)	Exceeds LOS C Capacity?
Alamo Dr.	West of Nut Tree Rd.	1,500	698	NO
Alamo Dr.	Nut Tree Rd. to Vanden Rd.	1,500	758	NO
Alamo Dr.	Vanden Rd. to Leisure Town Rd.	1,500	439	NO
Alamo Dr.	East of Leisure Town Rd.	600	183	NO
Nut Tree Rd.	North of Alamo Dr.	1,500	577	NO
Leisure Town Rd.	South of Vanden Rd.	900	757	NO
Leisure Town Rd.	North of Alamo Dr.	1,500	535	NO

Notes: 1. LOS C directional capacity represents the capacity for one direction of the facility. This capacity is assumed to be 60% of the two-way LOS C capacity. For details see Appendix H and Figure 6-1 City of Vacaville 1990 General Plan.
Source: Fehr & Peers, February 2003.

Thresholds of Significance

Impacts would be considered significant if the Project would:

- Cause a roadway or intersection to operate at a LOS D or worse on a long-term basis (when the roadway or intersection operates at LOS C or better without the Project);
- Significantly impair operation of a nearby roadway or intersection that operates, or is projected to operate, at unacceptable levels without the Project such that the V/C ratio is degraded by a total of 0.02 or greater by the project;
- Fail to adequately accommodate transit or bicycle facilities on-site;
- Fail to adequately provide for emergency access; or,
- Compromise safety or cause significant stacking as a result of inadequate parking capacity on-site.

Environmental Impact and Mitigation Measures

Impact T-1 Reduction in LOS of nearby Roadways and Intersections

Existing Plus Approved Projects Intersections

The study intersections were analyzed with Approved Projects (i.e. not yet constructed or occupied). The results for this analysis without and with the proposed project are shown in Table 3.13-7.

Without the project, the Alamo Drive/Merchant Street, Leisure Town Road/I-80 Eastbound Ramps, Leisure Town Road/I-80 Westbound Ramps, and Vanden Road/Cannon Road intersections would operate at LOS D or worse due traffic generated by approved projects.

The Project would **significantly impact** the following intersections:

- Alamo Drive/Leisure Town Road/Fry Road
- Leisure Town Road/Vaca Valley Parkway/I-80 Westbound Ramps
- Vanden Road/Cannon Road

Mitigation Measure T-1a

The following mitigation measures are required for the Project:

- **Developer shall provide striping and street improvements needed for a right-turn lane in the southbound direction on Leisure Town Road at the Alamo Drive/Leisure Town Road/Fry Road intersection, or City decision makers shall accept LOS D at this intersection. If LOS D is accepted, the City shall continue to monitor this intersection, and all future development impacting this intersection would be required to maintain LOS D.**
- **Although the Leisure Town Road/Vaca Valley Parkway/I-80 Westbound Ramps intersection would be impacted, this is expected to be temporary as the improvements planned for the Leisure Town Road Overcrossing would provide LOS C or better operations. The City shall monitored this intersection to verify that the construction of the overcrossing improves operations to an acceptable LOS.**
- **Install a traffic signal at the Vanden Road/Cannon Road intersection based on direction from Solano County. The Jepson Parkway Improvements would provide a through lane and right-turn lane in the northbound direction on Vanden Road. Developer shall participate in its fair-share contribution to intersection improvements.**

Impacts to Alamo Drive/Leisure Town Road/Fry intersection would be reduced to **less-than-significant levels** through the incorporation of the identified mitigation. Vanden Road/Cannon Road intersection would operate at LOS D, but in the future Vanden Road is expected to be widen to four lanes which would improve operations to LOS A. Leisure Town Road/Vaca Valley Parkway/I-80 Westbound Ramps intersection would be impacted in the interim, therefore the impact for this intersection is **significant and unavoidable**.

Existing Plus Approved Projects Roadway Segments

Project impacts on nearby roadway segments were analyzed for each of the previously described scenarios. Each roadway segment was analyzed based on the P.M. peak hour volumes for the peak direction. The roadway segment analysis with the Approved Projects is shown in Table 3.13-8. The Project would have no significant impacts to the roadway network.

Year 2025 Intersections

California Drive overcrossing is an improvement included in the City of Vacaville Transportation Impact Fee Program. This means it would be funded by the Traffic Impact Fees. Year 2025 land use projections are consistent with those assumed in the Transportation Impact Fee Program; therefore, funding for the construction of the California Drive overcrossing would be generated by the year 2025 development included in this Program. The overcrossing is an improvement projected to be needed towards the end of the Transportation Impact Fee Program. As a result, year 2025 analysis was conducted both without and with the overcrossing to determine if this assumption was valid. Study intersections were analyzed without and with the Project, and without and with the California Drive overcrossing and recommended mitigation measures. The results for this analysis are shown in Table 3.13-9. The analysis indicates there would be a need for this improvement (or arguably a replacement improvement) to support traffic from cumulative development even without the construction of the project. Therefore, the project was only tested with the overcrossing to determine if it resulted in impacts beyond cumulative without project.

Without the project, the Alamo Drive/Peabody Road, Alamo Drive/Merchant Street, Leisure Town Road/I-80 Eastbound Ramps, and Vanden Road/Cannon Road intersections would operate at LOS D due to traffic generated by future growth.

The Project would **significantly impact** the following intersections:

- Alamo Drive/Leisure Town Road/Fry Road
- Alamo Drive/Nut Tree Road
- Alamo Drive/Peabody Road
- Vanden Road/Leisure Town Road
- Leisure Town Road/Collector C

Table 3.13-7
Existing Plus Approved with and without Project
Peak Hour Intersection Level of Service Analysis

Intersections	Peak Hour	without Project		with Project	
		MOE[1]	LOS	MOE[1]	LOS
Signalized Intersections[2]					
1. Alamo Dr./Leisure Town Rd./Fry Rd.	PM	0.69	B	0.84	D
2. Alamo Dr./Vanden Rd.	PM	0.64	B	0.51	A
3. Alamo Dr./Nut Tree Rd.	PM	0.72	C	0.69	B
4. Alamo Dr./Peabody Rd.	PM	0.66	B	0.70	B
5. Alamo Dr./I-80 Eastbound On-Ramp	AM PM	0.52 0.53	A A	0.55 0.51	A A
6. Alamo Dr./Merchant St.	AM PM	0.86 0.71	D C	0.87 0.72	D C
7. Vanden Rd./Leisure Town Rd.	PM	0.57	A	0.57	A
8. Leisure Town Rd./ I-80 EB Ramps	AM PM	0.99 0.92	E E	0.89 0.92	D E
9. Leisure Town Rd./Vaca Valley Pkwy/ I-80 WB Ramps	AM PM	0.97 1.06	E F	0.98 1.08	E F
Unsignalized Intersections					
10. Vanden Rd./Cannon Rd. [3]	PM	>50 [0.77]	F [C]	>50 [0.82]	F [D]
11. Cannon Rd./North Gate Rd.[3]	PM	16.3	C	17.3	C
12. Nut Tree Rd./Collector C[5]	PM	NA	NA	10.4	B
13. Vanden Rd./Collect A[4]	PM	NA	NA	8.0	A
14. Vanden Rd./Collector B[5]	PM	NA	NA	8.9	A
15. Vanden Rd./Collector C[5]	PM	NA	NA	9.0	A
16. Vanden Rd./Collector D[4]	PM	NA	NA	8.0	A
17. Leisure Town Rd./Collector E[6]	PM	NA	NA	NA	NA
18. Leisure Town Rd./Collector C[5]	PM	NA	NA	20.2	C

Notes: NA = Not applicable, proposed project intersection. [X] = V/C ratio or LOS w/ signal and additional northbound through lane.

1. MOEs reported are volume-to-capacity (V/C) for signalized intersections and average delay per vehicle in seconds per vehicle for unsignalized intersections.
2. Signalized intersection LOS based on sum of V/C for critical movements for each approach for the intersection, according to the *Interim Materials on Highway Capacity Manual*, Circular 212, Transportation Research Board, 1980.
3. All-way stop-controlled intersections LOS is based on average delay per vehicle (in seconds) according to the *Highway Capacity Manual*, Transportation Research Board, 2000.
4. Traffic circle controlled intersection LOS based on weighted average control delay (seconds per vehicle) according to *Roundabouts: An Informational Guide,* Federal Highway Administration, 2000.
5. Side-street stop intersection LOS is based on average control delay (seconds per vehicle) for the worst case stop- controlled movement according to the *Highway Capacity Manual*, Transportation Research Board, 2000.
6. Assumed Collector E is right-in/right-out roadway; therefore, this intersection has no control.

Source: Fehr & Peers, 2003

Mitigation Measure T-1b

The following mitigation measures are required for the Project:

- **Provide two lanes in the eastbound direction on Alamo Drive at the Alamo Drive/Leisure Town Road/Fry Road intersection, and/or provide two left-turn lanes in the southbound direction. City shall continue to monitor this intersection; and limit future development to maintain LOS C operation, require improvements as future conditions of approval and/or included in City funded projects, or determine that LOS D is acceptable.**
- **City shall determine if right-of-way exist, or is reasonably acquired to widen Alamo Drive or Nut Tree Road to include three through lanes in each direction. City shall continue to monitor this intersection; and limit future development to maintain LOS C operations, require improvements as future conditions of approval and/or as part of the City funded projects, or City may determine that LOS D is an acceptable.**
- **No feasible mitigation is possible at Alamo Drive/Peabody Road intersection.**
- **Modify the Vanden Road/Leisure Town Road intersection to include two left-turn lanes in the northbound direction and two right-turn lanes in the eastbound direction. City shall continue to monitor this intersection; and limit future development to maintain LOS C operations, require improvements as future conditions of approval and/or included in City funded projects, or City may determine that LOS D is an acceptable.**
- **Install a traffic signal at the Leisure Town Road/Collector C intersection. Developer shall either install signal as part of improvements, or deposit funds with City to install signal at this location in the future. If deposit, City shall monitor the operation of this intersection, and install signal when warrants are expected to be met.**

Impacts to all intersections except the Alamo Drive/Peabody Road intersection would be reduced to **less-than-significant levels** through the incorporation of identified mitigation. Although the Alamo Drive/Peabody Road intersection would be impacted, LOS D is estimated whether or not the Project is developed. The impact for this intersection is **significant-and-unavoidable**.

Table 3.13-8
Existing Plus Approved with and without Project
Peak Hour Roadway Segment Analysis

Roadway Segment	Peak Direction Volume (vph)		Peak Direction Volume Exceeds LOS C Capacity?	
	without Project	with Project	without Project	with Project
Alamo Dr. West of Nut Tree Rd.	1,004	1,106	NO	NO
Alamo Dr. Nut Tree Rd. to Vanden Rd.	812	685	NO	NO
Alamo Dr. Vanden Rd. to Leisure Town Rd.	366	396	NO	NO
Alamo Dr. East of Leisure Town Rd.	258	338	NO	NO
Nut Tree Rd. North of Alamo Dr.	800	859	NO	NO
Vanden Rd. South of Leisure Town Rd.	772	769	NO	NO
Leisure Town Rd. North of Alamo Dr.	703	964	NO	NO
Nut Tree South of Collector C	NA	223	NA	NO
Nut Tree Rd. Collector C to Alamo Dr.	NA	763	NA	NO
Vanden Rd. Leisure Town Rd. to Collector C	NA	18	NA	NO
Vanden Rd. Collector A to Collector B	NA	60	NA	NO
Vanden Rd. Collector A to Alamo Dr.	NA	270	NA	NO
Leisure Town Rd. Vanden Rd. to Collector C	NA	506	NA	NO
Leisure Town Rd. Collector C to Collector E	NA	493	NA	NO
Leisure Town Rd. Collector E to Alamo Dr.	NA	689	NA	NO

Notes: NA = Not applicable, roadway segment only exist with project.
Bold: Indicates significant impact.
1. LOS C directional capacity represents the capacity for one direction of the facility. This capacity is assumed to be 60% of the two-way LOS C capacity. For details, see Table 3 of this report and Figure 6-1 shown in the City of Vacaville 1990 General Plan.

Source: Fehr & Peers, 2003.

Table 3.13-9
Year 2025 without and with the Project
Peak Hour Intersection Level of Service Analysis

Intersections	Peak Hour	without Project				with Project	
		without Overcrossing		with Overcrossing		with Overcrossing	
		V/C [1]	LOS	V/C [1]	LOS	V/C [1]	LOS
Signalized Intersections [2]							
1. Alamo Dr./Leisure Town Rd./Fry Rd.	PM	0.78	C	0.75	C	0.85	D
2. Alamo Dr./Vanden Rd.	PM	0.72	C	0.65	B	0.50	A
3. Alamo Dr./Nut Tree Rd.	PM	0.79	C	0.78	C	0.82	D
4. Alamo Dr./Peabody Rd.	PM	0.85	D	0.81	D	0.87	D
5. Alamo Dr./I-80 EB On-Ramp	AM	0.82	D	0.49	A	0.53	A
	PM	0.66	B	0.38	A	0.53	A
6. Alamo Dr./Merchant St.	AM	1.09	F	0.88	D	0.89	D
	PM	0.92	E	0.61	B	0.77	C
7. Vanden Rd./Leisure Town Rd.	PM	0.77	C	0.80	C	0.87	D
8. Leisure Town Rd./ I-80 EB Ramps	AM	0.65	B	0.65	B	0.64	B
	PM	0.77	C	0.82	D	0.83	D
9. Leisure Town Rd./Vaca Valley Parkway/ I-80 WB Ramps	AM	0.64	B	0.64	B	0.65	B
	PM	0.77	C	0.77	C	0.80	C
10. Vanden Rd./Cannon Rd.	PM	0.88	D	0.88	D	0.89	D
Unsignalized Intersections							
11. Cannon Rd./North Gate Rd.[3]	PM	**9.9**	**A**	**9.9**	**A**	9.7	A
12. Nut Tree Rd./Collector C[5]	PM	NA	NA	NA	NA	13.6	B
13. Vanden Rd./Collect A[4]	PM	NA	NA	NA	NA	9.0	A
14. Vanden Rd./Collector B[5]	PM	NA	NA	NA	NA	9.1	A
15. Vanden Rd./Collector C[5]	PM	NA	NA	NA	NA	9.3	A
16. Vanden Rd./Collector D[4]	PM	NA	NA	NA	NA	9.0	A
17. Leisure Town Rd./Collector E[6]	PM	NA	NA	NA	NA	NA	NA
18. Leisure Town/Collector C[5]	PM	NA	NA	NA	NA	42.7	E

Notes: NA = Not applicable, intersection associated with Project. **Bold: Indicates significant impact.**

1. Volume-to-capacity (V/C) is reported for signalized intersections and average delay per vehicle in seconds per vehicle is reported under the V/C column for unsignalized intersections.
2. Signalized intersection LOS based on sum of V/C for critical movements for each approach for the intersection, according to the *Interim Materials on Highway Capacity Manual*, Circular 212, Transportation Research Board, 1980.
3. All-way stop-controlled intersections LOS is based on average delay per vehicle (in seconds) according to the *Highway Capacity Manual*, Transportation Research Board, 2000.
4. Traffic circle controlled intersection LOS based on weighted average control delay (seconds per vehicle) according to *Roundabouts: An Informational Guide,* Federal Highway Administration, 2000.
5. Side-street stop intersection LOS is based on average control delay (seconds per vehicle) for the worst case stop- controlled movement according to the *Highway Capacity Manual*, Transportation Research Board, 2000.
6. Assumed Collector E is right-in/right-out roadway, therefore, this intersection has no control.

Source: Fehr & Peers, 2003.

Roadway Segments

Project impacts on nearby roadway segments were analyzed for each of the previously described scenarios. Each roadway segment was analyzed based on the P.M. peak hour volumes for the peak direction. The roadway segment analysis without and with the California Drive over-crossing and without and with the Project is shown in Table 3.13-10. Without the project, Alamo Drive from Nut Tree Road to Vanden Road would operate between LOS C and LOS D. The Project would result in significant impacts to Leisure Town Road north of Alamo Drive, which would operate at LOS D in the future.

Mitigation Measure T-1c

- **LOS C operations would be maintained by adding one lane to Leisure Town Road between Alamo Drive and Interstate 80 in each direction consistent with City roadway standards, making this roadway a six-lane arterial. As part of the Jepson Parkway project Leisure Town Road would be a four lane arterial therefore, the City shall monitor Leisure Town Road between Alamo Drive and Interstate 80 to limit future development to maintain LOS C operations, or the City may determine that LOS D is acceptable.**

Due to the fact that the City is constrained by the Jepson Parkway project, the impact to Leisure Town Road is **significant-and-unavoidable**.

Table 3.13-10
Year 2025 without and with Project [1]
Peak Hour Roadway Capacities

Roadway Segment	Peak Direction Volume (vph)			Peak Direction Volume Exceeds LOS C Capacity		
	w/o Project w/o Over-crossing	w/o Project w/ Over-crossing	w/ Project w/ Over-crossing	w/o Project w/o Over-crossing	w/o Project w/ Over-crossing	w/ Project w/ Over-crossing
Alamo Dr. West of Nut Tree Rd.	1,080	1,332	1,496	NO	NO	NO
Alamo Dr. Nut Tree Rd. to Vanden Rd.	1,332	1,557	1,100	NO	YES	NO
Alamo Dr. Vanden Rd. to Leisure Town Rd.	644	837	773	NO	NO	NO
Alamo Dr.East of Leisure Town Rd.	854	850	885	NO	NO	NO
Nut Tree Rd. North of Alamo Dr.	1,088	1,076	1246	NO	NO	NO
Vanden Rd. South of Leisure Town Rd.	1,199	1,249	1185	NO	NO	NO
Leisure Town Rd. North of Alamo Dr.	1,436	1,306	1611	NO	NO	YES
Nut Tree South of Collector C	NA	NA	482	NA	NA	NO
Nut Tree Rd. Collector C to Alamo Dr.	NA	NA	1,030	NA	NA	NO
Vanden Rd. Leisure Town Rd. to Collector C	NA	NA	204	NA	NA	NO
Vanden Rd. Collector A to Collector B	NA	NA	55	NA	NA	NO
Vanden Rd. Collector A to Alamo Dr.	NA	NA	422	NA	NA	NO
Leisure Town Rd. Vanden Rd. to Collector C	NA	NA	601	NA	NA	NO
Leisure Town Rd. Collector C to Collector E	NA	NA	680	NA	NA	NO
Leisure Town Rd. Collector E to Alamo Dr.	NA	NA	905	NA	NA	NO

Notes: NA = Not applicable, roadway segment only exist with Project.
1. Year 2025 conditions Without Project was analyzed without and with California Drive Over-crossing. With Project conditions were analyzed with California Drive Over-crossing.
Source: Fehr & Peers, February 2003.

Impact T-2 Inadequate Bicycle and Transit Access

The Project will also include the development of an open space system providing bicycle and pedestrian access throughout the site, as shown on the proposed preliminary Project site plan in Section 2.0 of this EIR. Leisure Town Road will be constructed in accordance with the provisions of the Jepson Parkway Concept Plan, including required medians, landscaping, and pedestrian and bicycle paths along the roadway frontage on both the western Southtown side and eastern Southtown Commons side of the Project.

Nut Tree Road will be widened to the planned full design width, and the Project will also involve a landscaped setback area and meandering sidewalk along the eastern side of the roadway adjacent to the western boundary of the Southtown site.

The July 2003 *Infrastructure Feasibility Study* illustrates typical street sections, which include standard sidewalks, meandering sidewalks, and bike paths. The Project, through City staff review, will be required to provide streets according to City development standards, which will include provision of pedestrian access. In addition, the *Feasibility Study* indicates that the Project will provide traffic-calming features such as special pavement treatment at areas where potential automobile-pedestrian conflict is envisioned, median pedestrian refuge islands at intersections with arterial streets, and raised pavement sections at intersections of landscaped bike paths/greenbelts and streets. These features typically reduce real and perceived dangers to pedestrian and bicycle travel.

The City provides transit service through the Vacaville City Coach. The City Coach has routes throughout the city, connecting with various destinations, as well as connecting to other regional transit providers. The proposed Project site plan and application materials do not identify transit locations on-site. This is **potentially significant impact** that requires mitigation.

Mitigation Measure T-2

- **The City shall review the Project in relation to exiting and future transit routes and transit facility needs.**
- **The Project shall accommodate, and tentative maps shall show, locations of any transit facilities determined to be necessary by the City.**

With incorporation of identified mitigation, the impact is considered **less than significant**.

Impact T-3 Inadequate Parking Supply for Routine Use

The proposed site plans and application materials do not demonstrate parking locations, amounts, or designs. City parking standards will apply to future entitlements for land uses proposed on-site. The future Project land uses that generate demand for parking, according to the City, will be required to provide parking in adequate supply and appropriate locations to avoid any safety impact that may otherwise result. The following mitigation measure is recommended to address this **potentially significant** impact.

Mitigation Measure T-3

Improvement plans shall show parking in amounts and locations consistent with City parking standards, subject to City approval.

With incorporation of the identified mitigation measure, the impact is considered **less than significant.**

Impact T-4 Inadequate Emergency Access

Adequate emergency access is not defined by levels of service at intersections or roadways under peak use conditions, but rather is based on the ability of emergency vehicles to quickly and adequately serve portions of the site.

The proposed site plan shows two street entrances to the Southtown portion of the Project site from the west, one entrance from the north, and two entrances from Leisure Town Road from the east. The two entrances on the eastern side of the Southtown portion of the Project site align with the two entrances to the Southtown Commons side of the Project. The site plan also shows two roads stubbed out for future use to connect to future development to the south.

The Project, through City staff review and plan approval, will be required to adequately provide emergency access to the various proposed land uses, and will be required to adequately sign proposed buildings and streets to facilitate fire and emergency navigation of the property. Emergency access appears to be adequate, according to proposed site plans. Roadways appear to be provided in close proximity to proposed lots that could accommodate inhabited structures. The impact is **less than significant**.

4.0 Alternatives to the Project

Statutory Requirements

The California Environmental Quality Act and the CEQA Guidelines require that alternatives to the proposed Project be discussed and analyzed in the EIR. The purpose is to inform decision-makers of the differential environmental effects that may be associated with each potential alternative and enable a reasonable judgment as to whether the Project or one of the alternatives is environmentally superior. Section 15126.6(a) of the CEQA Guidelines provides the following description of what should be included in the analysis of project alternatives:

> Alternatives to the Proposed Project. An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose it's reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other that the rule of reason.

This section provides for analysis of the environmental effects associated with several alternative development proposals, as well as the required "No Project alternative". This analysis is consistent with the requirements of CEQA and concludes with a statement of environmental superiority for the alternative which has the least overall impact on the environment.

Project Objectives

The City has created objectives for the development of this site, by which the alternatives presented herein are analyzed. Project objectives are the overriding goals of the City with regards to development of the site. These objectives are based on goals identified in the General Plan, policies enacted by the City Council, and other guiding principles of the City. The objectives of the Project are to provide each of the following:

- A variety of housing opportunities for all social and economic sectors of the City;
- Greenbelts, open space areas, parks, landscaped areas, bicycle paths and pedestrian trails;
- Community facilities;
- Neighborhood serving commercial uses;
- Household and recreational vehicle storage;
- Infrastructure extensions to the area south of the Project site; and,
- A two-lane extension of Foxboro Parkway from its current terminus at Nut Tree Road to the intersection of Vanden and Leisure Town Roads.

Identification of Project Alternatives

In accordance with the alternatives analysis requirement of CEQA, three alternative projects, including the No Project alternative, have been identified. These alternatives represent viable options for development of the site, with varying types and degrees of development. Each alternative was chosen as a way to potentially reduce environmental impacts, while still achieving some or all of the project objectives. As part of the formulation of the alternatives, alternate sites around the city were reviewed for ability to accommodate a similar development. All sites identified as possible alternatives for this Project contained equal or greater potential for environmental impact as the proposed Project site. CEQA alternatives analysis requires that alternatives considered lessen environmental impacts as compared to the proposed Project. Thus, no off-site alternative is considered in this section.

The following section lists the design characteristics of each alternative, and provides explanations of deviations from the original Project design. Impacts associated with each alternative, comparisons between alternatives, and satisfaction of project objectives are also provided herein.

Alternative 1: No Project

Section 15126.6(e)(1) of the Government Code provides the following direction relative to the "No Project" alternative:

> The specific alternative of "no project" shall also be evaluated along with its impact. The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The no project alterative analysis is not the baseline for determining where the proposed project's environmental impacts may be significant, unless it is identical to the existing environmental setting analysis which does establish that baseline (see Section 15125).

The No Project Alternative assumes that the site would remain in operation with current land uses. This includes agricultural operations on all former and current fields, with continued operation of residential structures already constructed on the site.

Alternative 2: Existing General Plan Alternative

The Existing General Plan Alternative (herein referred to as Alternative 2) assumes that the site would eventually be developed with a mix of residential, school, park, and open space uses. These uses are consistent with the existing land use designations set forth in the *Vacaville General Plan*. It is assumed, for the purposes of this analysis, that the development would occur at the midpoint of allowed density for residential areas, and at an intensity similar to existing city development for other land uses.

Alternative 3: Rural/Estate Density Residential Alternative

The Rural/Estate Density Alternative (also known as Alternative 3) projects development of the project site with low-density, rural lot size residential uses. This General Plan category allows for development of homes on lots ranging from 0.5 to three acres in size. In this alternative, all development would be residential, and no schools, businesses, parks, or other accessory uses would be constructed. The premise of this design is to preserve the rural nature of the site and provide a buffer between the suburban uses to the north and west of the site and the agricultural uses to the south and east. At maximum development (3 units per acre), this alternative could result in the construction of 891 residences on site.

Comparison of Alternatives

The following section provides a comparison of the environmental impacts associated with each of the Project alternatives. In each case, impacts differing from those in the Proposed Project are identified and discussed. The section concludes with the designation of the environmentally superior alternative.

Alternative 1: No Project

Characteristics of Alternative

Under the no project alternative, the Project site would continue operation in agricultural use, with only existing residences and structures. No farmland would be converted to urban uses, no additional demand for public services would be generated and no additional traffic and associated noise and air pollution would be generated. The site would not be annexed to the City.

The no project alternative, while required by CEQA to be analyzed, would be an unlikely alternative. The project site has been designated for urban residential uses by the 1990 General Plan and is within the City's sphere of influence. This alternative would occur only if the site is not annexed.

Environmental Considerations

Aesthetics

Impacts to aesthetics will be reduced in this alternative. Without development, there will be no alternation to existing viewsheds, and no change in the rural character of the site. No additional sources of light or glare will be created, eliminating potential impacts on current and future residents. Overall impacts to aesthetics and visual resources are fewer in this alternative.

Agricultural Resources

Under the No Project alternative, the site would remain in use as agricultural fields. This would eliminate impacts associated with conversion of the site to non-agricultural use. Impacts associated with agricultural resources are reduced in this alternative.

Air Quality

Air quality impacts would be reduced in this alternative compared to the proposed Project. No construction related emissions, additional vehicular traffic emissions, or operational impacts would occur in this scenario. Air quality would not be worsened from existing levels as a result of any Project site development, and no mitigation would be required. Traffic congestion in the vicinity, an important factor in calculating air quality impacts, would also be lower under the No Project alternative scenario. Impacts related to air quality are lower in this alternative than with the proposed Project.

Biological Resources

Under the No Project alternative, no construction or grading of the Project site would occur. Without construction, there is no significant risk of impact to candidate, sensitive, or endangered species on-site, nor is there the potential to negatively impact wetlands or other waters of the United States. Overall impacts to biological resources are reduced in this alternative, as compared to the proposed Project.

Cultural Resources

Impacts to cultural resources would be reduced in the No Project alternative. The historic farmhouse identified on the Project site would be impacted under the proposed development, but the No Project alternative would allow for continued operation of this house and all uses currently surrounding it. Overall impacts are therefore less with the alternative than the proposed Project.

Geology, Soils, and Mineral Resources

Impacts to geology, soils, and mineral resources are expected to be less with the alternative than the proposed Project. While no significant impacts are anticipated to occur with the Project, impacts related to risks from geologic activity, including earthquakes, landslides, and liquefaction are possible, even if unlikely. Reducing population and structures on the site will necessarily reduce potential for impacts associated with these risks; therefore overall impacts are less with the alternative than with the Project.

Land Use Planning, Population, and Housing

Impacts to land use planning, population, and housing are expected to be less with the alternative than the proposed Project. Continuation of existing land uses, as called for in the alternative, would not require amendments to the General Plan, would not conflict with any policies adopted for the purpose of protecting environmental resources, or otherwise require changes to land use or regulatory documents. The impacts are less with the alternative than the proposed Project.

Noise

Noise impacts would be significantly reduced with this alternative. No construction or operation noise would be generated, nor would additional residential structures be placed near existing and planned noise generators. No increase in ambient noise level would occur. Overall, impacts related to noise would be lower with this alternative.

Public Services

Impacts to public services would be greatly reduced in the No Project Alternative. With no additional population, there would be no increased demand on police, fire, schools, libraries, or other general government services. Continued use of the property as agricultural and rural residential use would require no additional services beyond what is currently available. The impacts are reduced in this alternative.

Public Utilities

The No Project Alternative would significantly reduce potential impacts to public utilities. With no additional population or structures, the alternative would result in no additional demand for water, sewer, storm drainage, or other public utilities. The impacts are fewer in the alternative than in the proposed Project.

Safety

Impacts to safety would be reduced in the No Project Alternative. Although the Project site is not located within an area of high probability of safety hazard, several area sites have the potential to create safety impacts for residents and users of the Project. The alternative would not increase the number of persons or structures on the site, thus potential impacts from accidents or other safety concerns would be reduced, as compared to the Project. Impacts to safety are fewer with the alternative.

Surface Hydrology and Water Quality

Impacts to hydrology and water quality would be reduced in this alternative. The alternative would not increase the amount of impervious surface, and would not require any grading or construction. The lack of construction and impervious surface will allow for greater groundwater recharge on site, reduce potential impacts to area waterways from urban runoff, and will not add volume to stormwater discharge in the City's stormwater management system. The impacts from the alternative are less than those in the proposed Project.

Transportation

Impacts associated with transportation relate to the number of trips that the development will produce at a given time, and the ability of roadways to accommodate those trips. The times at which the most trips are generated are referred to as peak hour trips, typically during the evening rush hour of weekdays. Using estimated trip generation rates established in the Vacaville Citywide Traffic Model, trip generation rates were estimated for the proposed Project and for the No Project alternative. The No Project alternative (without Project with California Drive Overcrossing) would

result in significant impacts to one intersection and one roadway segment, while the Project would result in potentially significant impacts to five intersections and two roadway segments – with Project mitigation, all but one intersection would operate at acceptable levels of service. With a lower number of automobile trips generated, the alternative would have less of an impact on existing roadways. Thus, the alternative has fewer transportation impacts than the proposed Project.

Ability to Meet Stated Project Objectives

The No Project Alternative would not be able to meet any of the Project objectives, failing to provide:

- A variety of housing opportunities for all social and economic sectors of the City;
- Greenbelts, open space areas, parks, landscaped areas, bicycle paths and pedestrian trails;
- Community facilities;
- Household and recreational vehicle storage;
- Infrastructure extensions to the area south of the Project site;
- A two-lane extension of Foxboro Parkway from its current terminus at Nut Tree Road to the intersection of Vanden and Leisure Town Roads; and
- Neighborhood serving commercial uses.

The Alternative would meet none of the seven objectives identified by the City for the Project.

Alternative 2: Existing General Plan Alternative

Characteristics of Alternative

The Vacaville General Plan designates the project site for development with Estate Residential (0.5 – 3.0 units per acre); Low Density Residential (3.1 – 5.0 units per acre); two elementary schools (10 acres each); two public parks (6 acres each, generally adjoining the school sites); and a 20-acre manufactured home park (6-10 units per acre). The General Plan identifies the project site as a part of the "Vanden Area". There are a variety of General Plan policies that apply generally to the Vanden Area, and the following that apply to this area specifically:

> *Policy 2.5 – I3 (Paraphrased): "In the Vanden Specific Plan Area development areas require a housing unit dwelling mix of 55% single family, 25% moderate density, and 20% high density."*
>
> *"In any development exceeding 400 units, require a mix of development types and/or densities, including a component of larger lots and homes (at least 10% of the total) and a component of Residential Medium or Residential High Density units (at least 10% of the total).*

Consistent with the requirements of the General Plan, this alternative would have a significant portion of residential development. Assuming development would occur at a density equal to the midpoint of the allowable range, the following residential units would be developed on the site:

Low Density (0.5 – 5.0 du/ac):	= 380 units* (5,000 – 10,000 sq. ft. lots)
Moderate Density (5.1 – 14.0 du/ac):	= 497 units* (3,600 – 4,500 sq. ft. lots)
High Density (14.1 – 24.0 du/ac):	= 793 units*

Manufactured Housing (6 – 10 du/ac):= 160 units*

1,830 units

In addition, two elementary schools of the Travis Unified School District would be constructed and operated, along with 12 acres of public city parks. A 1,500 foot wide area east of Leisure Town Road would remain undeveloped as a buffer zone, consistent with General Plan policies.

Environmental Considerations

Aesthetics

Impacts to aesthetics and visual resources related to this alternative would be similar to the proposed Project. Major aesthetic considerations associated with urban development in this area are the elimination of the existing visual character of the site, the production of lighting and glare, and the loss of viewsheds from this and adjacent properties. The scale of development and the boundaries of the project are similar in this alternative, and new sources of light would be largely similar as well. Impacts to aesthetic resources would remain the same with this alternative.

Agricultural Resources

This alternative would include full development of the Project site, eliminating agricultural operation of all lands on the site. Impacts on agricultural resources are identical to the proposed Project.

Air Quality

Major air quality issues associated with development of this type include impacts resulting from grading and construction, operation of vehicles, and potential exposure of air pollutants to sensitive receptors (people sensitive to air quality impacts). The alternative proposes more residential units (1,830) than the proposed Project (1,590), and at higher densities. The alternative also reduces the amount of parkland, eliminates commercial and self-storage uses, and adds two elementary schools compared to the proposed Project. Grading impacts would be expected to be similar to the proposed Project, as the entire site would presumably be graded for development. Air quality impacts from construction would be similar in character, but would be reduced in level compared to the proposed Project since development would occur more gradually, as envisioned in the General Plan. While more homes are constructed in the alternative, there are no commercial or self storage uses. Operational air quality impacts, specifically those related to vehicle emissions, are expected to be lower in the alternative:

- 125 pounds per day for ROG (same as Project emissions)
- 63 pounds per day for NO_x (lower than Project emissions)
- 451 pounds per day for CO (lower than Project emissions)
- 95 pounds per day for PM_{10} (lower than Project emissions)

The higher density of the housing supports alternatives to automobile travel. Siting of schools in the neighborhood reduces the number and length of school-related trips for a number households. The larger number of apartments causes a reduction in the per-unit trip rate compared to the proposed Project. Overall, the air quality impact of this alternative would be lower than the proposed Project.

Biological Resources

Impacts to biological resources are expected to be similar between this alternative and the proposed Project. Any impacts to seasonal wetlands, waters of the United States, potentially occurring sensitive plant and animal species, and other biological resources would be impacted by full urban development of the Project site. Mitigation measures available and feasible for reduction of impacts to biological resources for the proposed Project would be identical to those for the alternative. It is possible that the open space buffer called for in the existing General Plan would provide some limited additional habitat for existing species on site, but this would not be sufficient to alter the overall impacts to such species. Thus, overall impacts to biological resources are likely to be equal between the two development proposals.

Cultural Resources

The only major cultural resource identified on the Project site is the farmhouse located east of Leisure Town Road. This farmhouse is eligible for listing on the National Register of Historic Places, and there are potential impacts associated with development of the sites surrounding the house and the demolition of the house itself. The EIR has identified impacts to the house as potentially significant. The General Plan designation of the house allows for residential development on the site and its surroundings, thus the potential for impacts to the home remain identical to the proposed development. The impacts to cultural resources are considered identical.

Geology, Soils, and Mineral Resources

Impacts related to geology, soils, and mineral resources are the potential loss of topsoil resulting from development, as well as exposure of persons and structures to earthquakes, liquefaction, and other geologic hazards. Potential impacts to these resources are common for any developments that may occur on the site. Risks associated with geologic hazards will not vary between the alternative and proposed Project, as they will be located on the same site and will be subject to the same building code requirements for construction of buildings. Impacts are considered similar between the two proposals.

Land Use Planning, Population, and Housing

The proposed Project is inconsistent with various Vacaville General Plan policies. A significant number of amendments to the General Plan are proposed as part of the development application for this Project, in order to ensure consistency with the Plan. The alternative is based on a development scheme that is consistent with existing policies, and would require no amendments to the General Plan. Impacts related to General Plan consistency are therefore less with the alternative.

Either the proposed Project or the alternative would be required to annex into the City of Vacaville, and meet the requirements of the Local Agency Formation Commission (LAFCO) of Solano County. LAFCO requires that annexations be consistent with the General Plan and Zoning Ordinance. Because of the number of amendments to the General Plan required of the proposed Project, the alternative would be morel likely to meet the stated requirements of LAFCO with regards to

annexation proposals, and thus the alternative proposal would have fewer impacts than the proposed Project.

Overall, the impacts associated with land use planning, population, and housing are anticipated to be fewer with the alternative than with the proposed Project.

Noise

Noise impacts associated with this alternative are expected to be lightly less than the proposed Project. Reduction in noise impacts would result from the incorporation of the buffer zone between the residential development and the railroad tracks, reducing the impact of noise from trains on residents of the development.

All other noise impacts, including those related to construction and operation of structures and land uses, are expected to be similar. The overall result is a reduction in noise impacts with the alternative.

Public Services

Impacts to public services, which include schools, emergency response services, and general government services, are measured by the ability of the development to offset potential demand for additional services generated by the development. Impacts to schools generated by the new development are offset by school impact fees, and State law requires environmental analyses to find that developments which pay required school fees to have completely mitigated all impacts associated with their project. Impacts to hard costs (infrastructure and capital improvements) of police, fire, and other government services are covered by impact fees adopted by the City. However, soft costs (staffing, operational costs) of these services are not covered by impact fees, and are increased by each new person and structure to be served. With the increase in population and new housing units in this alternative, overall impacts to public services will be increased.

Public Utilities

Impacts to public utilities relate to the ability of utility providers to meet service demands generated by the development. These include water, sewer, electricity, storm drainage, and other municipal services. Service demands vary by land use, and typically require a full analysis for accurate calculation of demand. Such a study was completed as part of the development application for the proposed Project, projecting service demand for each of the proposed land uses.

The likely impacts to public utilities in this scenario would be similar to those in the proposed Project. Adequate water supply exists to accommodate additional development on the site, and a cursory review of the infrastructure for other utilities suggests that impacts to these systems would be similar as well.

Safety

Major safety issues associated with the proposed development relate to the proximity of the site to hazardous materials handling sites, potential generation of hazardous materials on the site as a result of the development, and impacts from Travis Air Force Base. Both the proposed Project and

this alternative will result in full development of the site with a significant number of homes. While location and number of homes varies slightly between the two scenarios, overall probability of impacts from nearby hazardous materials sites is generally the same. Neither the alternative nor the proposed Project would generate significant sources of hazardous materials on site, and no land uses or intensities proposed in either would be impacted significantly by Travis AFB. Overall, the safety impacts of the alternative are equal to those of the proposed Project.

Surface Hydrology and Water Quality

Impacts to hydrology and water quality would be similar in this alternative. The overall footprint of the development would remain the same, as the boundaries of the Project will not change. It is probable that the increase in housing construction and quantity of impervious surface will decrease groundwater recharge on site, increase potential impacts to area waterways from urban runoff, and will increase the volume of additional stormwater discharge in the City's stormwater management system. This would be offset somewhat by the reduction in commercial and institutional development, although likely enough to equate overall impacts with those of the proposed Project. The impacts from the alternative are greater than those in the proposed Project.

Transportation

Impacts associated with transportation relate to the number of trips that the development will produce at a given time, and the ability of roadways to accommodate those trips. The times at which the most trips are generated are referred to as peak hour trips, typically during the evening rush hour of weekdays. Using estimated trip generation rates established in the Vacaville Citywide Traffic Model, trip generation rates were estimated for the proposed Project and for this alternative. The peak hour trip generation for the proposed Project equals 1,079 trips, while the alternative would produce 987 trips. With a lower number of automobile trips generated, the alternative would have less of an impact on existing roadways. Thus, the alternative has fewer transportation impacts than the proposed Project.

Ability to Meet Stated Project Objectives:

The alternative is able to meet the following Project objectives, providing:

- A variety of housing opportunities for all social and economic sectors of the City;
- Greenbelts, open space areas, parks, landscaped areas, bicycle paths and pedestrian trails;
- Community facilities;
- Household and recreational vehicle storage;
- Infrastructure extensions to the area south of the Project site; and,
- A two-lane extension of Foxboro Parkway from its current terminus at Nut Tree Road to the intersection of Vanden and Leisure Town Roads.

While the Project cannot meet the following Project objective, failing to provide:

- Neighborhood serving commercial uses;

The Alternative would meet six of the seven objectives identified by the City for the Project.

Alternative 3: Rural/Estate Density Residential Alternative

Characteristics of Alternative

This alternative would develop the project site at densities ranging from 0.1 to 3.0 units per acre resulting in 30-891 units on lots ranging in size from 10,000 square feet to 10 acres. The purpose of this alternative is to consider development of the site as a buffer between the suburban uses of southeastern Vacaville and the agricultural areas to the east and south. Lot sizes would be smallest near the northern and western sides of the site, gradually growing across the eastern and southern sides. The largest lot sizes would be immediately adjacent to the southern and eastern boundaries of the site. While the density in this alternative could range from 0.1 to three units per acre, it is assumed for this analysis that the development would occur at the maximum density. This would provide the most accurate assessment of potential impacts associated with the alternative.

Environmental Considerations

Aesthetics

Impacts to aesthetics and visual resources related to this alternative would be similar to the proposed Project. Major aesthetic considerations associated with urban development in this area are the elimination of the existing visual character of the site, the production of lighting and glare, and the loss of viewsheds from this and adjacent properties. Building heights and massing would be the same as with the Project, boundaries of the project are similar in this alternative, and new sources of light would be largely similar as well. Impacts to aesthetic resources would remain the same with this alternative.

Agricultural Resources

This alternative would include full development of the Project site, eliminating agricultural operation of all lands on the site. Impacts on agricultural resources are identical to the proposed Project.

Air Quality

Major air quality issues associated with development of this type include impacts resulting from grading and construction, operation of vehicles, and potential exposure of air pollutants to sensitive receptors (people sensitive to air quality impacts). The alternative proposes fewer residential units (891 under maximum density assumptions) than the proposed Project (1,590), and at lower densities. The alternative also reduces the amount of parkland, eliminates commercial and self-storage uses. Grading impacts would be similar to the proposed Project, as the entire site would be surficially graded for development. Air quality impacts from construction would be similar, but perhaps would be reduced compared to the proposed Project, assuming a slightly less aggressive construction schedule. Operational air quality impacts, specifically those related to vehicle emissions, are expected to be lower in the alternative compared to the proposed Project. Using general assumptions and the URBEMIS 2001 air quality impact assessment software, daily operational air pollutant emissions are estimated:

- 64 pounds per day for ROG (approximately 50 percent of Project emissions)
- 37 pounds per day for NO_x (approximately 50 percent of Project emissions)
- 257 pounds per day for CO (approximately 50 percent of Project emissions)
- 54 pounds per day for PM_{10} (approximately 40 percent of Project emissions)

The lower number of housing units decreases the level of daily estimated pollutants associated with operation of vehicles. Eliminating the mix of uses may reduce the viability of transit use, which may encourage a greater number of automobile trips relative to lower-polluting transit trips, but overall the air quality impact of this alternative is lower than the proposed Project.

Biological Resources

Impacts associated with biological resources under this alternative are expected to be similar to those in the proposed Project. Each scenario calls for the complete development of the site, including destruction of any existing habitat for sensitive species. The lower densities of this alternative would not be likely to provide any additional useful habitat, thus the overall impacts must be considered similar to the proposed Project.

Cultural Resources

The only major cultural resource identified on the Project site is the farmhouse located east of Leisure Town Road. This farmhouse is eligible for listing on the National Register of Historic Places, and there are potential impacts associated with development of the sites surrounding the house and the demolition of the house itself. The EIR has identified impacts to the house as potentially significant. Development of the alternative would place additional housing around the historic home, and likely alter its historical value. Thus, impacts are assumed to be present for this alternative as well, and impacts of the alternative are similar to those of the proposed Project.

Geology, Soils, and Mineral Resources

Impacts related to geology, soils, and mineral resources are the potential loss of topsoil resulting from development, as well as exposure of persons and structures to earthquakes, liquefaction, and other geologic hazards. Potential impacts to these resources are common for any developments that may occur on the site. Risks associated with geologic hazards will not vary between the alternative and proposed Project, as they will be located on the same site and will be subject to the same building code requirements for construction of buildings. Impacts are considered similar between the two proposals.

Land Use Planning, Population, and Housing

The proposed Project is inconsistent with various Vacaville General Plan policies. A significant number of amendments to the General Plan are proposed as part of the development application for this Project, in order to ensure consistency with the Plan. The alternative is based on a development scheme that consists solely of residential development, at densities lower than that of the proposed Project. The existing General Plan land use designations for the site include provisions for continued agricultural use, as well as development of schools, parks, and a fire station. Additionally, provisions for open space buffers are not provided in this alternative. Thus, the alternative would also require several amendments to the General Plan.

Overall, the impacts associated with land use planning, population, and housing are anticipated to be similar between the alternative and the proposed Project.

Noise

Significant potential impacts related to noise include placement of housing near loud noise generating uses (railroad tracks), impacts to existing and future residents from construction noise, and overall increase in ambient noise levels. The alternative would place housing in the same proximity to the railroad tracks, thus this potential impact remains possible. With fewer homes and permanent residents proposed, the alternative would require less construction and potentially a shorter construction schedule. This would reduce the length of time that residents would be subject to construction noises. The overall increase in ambient noise levels is calculated as a function of the number of cars and persons utilizing the area. With a reduction in population and corresponding vehicle traffic, the increase in ambient noise level with the alternative is less than the proposed Project.

Overall, impacts related to noise are likely to be lessened in the alternative than in the proposed Project.

Public Services

Impacts to public services, which include schools, emergency response services, and general government services, are measured by the ability of the development to offset potential demand for additional services generated by the development. Impacts to schools generated by the new development are offset by school impact fees, and State law requires environmental analyses to find that developments which pay required school fees to have completely mitigated all impacts associated with their project. While impacts to infrastructure and capital improvements of police, fire, and other government services are covered by impact fees adopted by the City, soft costs such as staffing and operational expenses are not fully covered by existing fees. The reduction in population associated with this alternative would reduce potential impacts to emergency and general government services. Overall impacts are considered less in the alternative than in the proposed Project.

Public Utilities

Impacts to public utilities relate to the ability of utility providers to meet service demands generated by the development. These include water, sewer, electricity, storm drainage, and other municipal services. Service demands vary by land use, and typically require a full analysis for accurate calculation of demand. Such a study was completed as part of the development application for the proposed Project, projecting service demand for each of the proposed land uses.

The likely impacts to public utilities in this scenario would be similar to those in the proposed Project. Adequate water supply exists to accommodate additional development on the site, and a cursory review of the infrastructure for other utilities suggests that impacts to these systems would be similar as well.

Safety

Major safety issues associated with the proposed development relate to the proximity of the site to hazardous materials handling sites, potential generation of hazardous materials on the site as a result of the development, and impacts from Travis Air Force Base. Both the proposed Project and this alternative will result in full development of the site with a significant number of homes. While location and number of homes varies slightly between the two scenarios, overall probability of impacts from nearby hazardous materials sites is generally the same. Neither the alternative nor the proposed Project would generate significant sources of hazardous materials on site, and no land uses or intensities proposed in either would be impacted significantly by Travis AFB. Overall, the safety impacts of the alternative are equal to those of the proposed Project.

Surface Hydrology and Water Quality

Impacts to hydrology and water quality would be reduced in this alternative. The reduction in housing units developed, as well as the number of residentially zoned lots that could be formed, would result in less development of impervious surfaces, and would require less construction. The reduction in construction and quantity of impervious surface will allow for greater groundwater recharge on site, reduce potential impacts to area waterways from urban runoff, and will reduce the volume of additional stormwater discharge in the City's stormwater management system. The impacts from the alternative are less than those in the proposed Project.

Transportation

Impacts associated with transportation relate to the number of trips that the development will produce at a given time, and the ability of roadways to accommodate those trips. The times at which the most trips are generated are referred to as peak hour trips, typically during the evening rush hour of weekdays. Using estimated trip generation rates established in the Vacaville Citywide Traffic Model, trip generation rates were estimated for the proposed Project and for this alternative. Traffic assumptions for the alternative were based on the highest potential density of development (891 units). The peak hour trip generation for the proposed Project equals 1,079 trips, while the alternative would produce 650 trips. With a lower number of automobile trips generated, the alternative would have less of an impact on existing roadways. Thus, the alternative has fewer transportation impacts than the proposed Project.

Ability to Meet Stated Project Objectives

The alternative is able to meet the following Project objectives, providing:

- Infrastructure extensions to the area south of the Project site; and,
- A two-lane extension of Foxboro Parkway from its current terminus at Nut Tree Road to the intersection of Vanden and Leisure Town Roads.

While the Project cannot meet the following Project objective, failing to provide:

- A variety of housing opportunities for all social and economic sectors of the City;
- Greenbelts, open space areas, parks, landscaped areas, bicycle paths and pedestrian trails;
- Community facilities; and

- Neighborhood serving commercial uses;
- Household and recreational vehicle storage;

The Project meets two of the seven objectives identified by the City for the Project.

Comparative Environmental Superiority

Table 4-1 provides a summary comparison of the potential environmental impacts of each of the three alternative Project proposals, including the "No Project" alternative with the proposed Project, using the following terms:

Greater: The impacts associated with the alternative are likely to be greater than those associated with the proposed Project.

Similar: The impacts associated with the alternative are proportional to those associated with the proposed Project.

Less: The impacts associated with the alternative are likely to be less than those associated with the proposed Project.

Table 4-1
Comparison of Project with Alternative Plans

Environmental Topic	Alternative 1 No Project	Alternative 2 General Plan Development	Alternative 3 Estate Density Development
Aesthetics	Less	Similar	Similar
Agricultural Resources	Less	Similar	Similar
Air Quality	Less	Less	Less
Biological Resources	Less	Similar	Similar
Cultural Resources	Less	Similar	Similar
Geology, Soils, and Minerals	Less	Similar	Similar
Land Use Planning, Population, and Housing	Less	Less	Similar
Noise	Less	Less	Less
Public Services	Less	Greater	Less
Public Utilities	Less	Similar	Similar
Safety	Less	Similar	Similar
Surface Hydrology and Water Quality	Less	Greater	Less
Transportation	Less	Less	Less
Project Objectives Met	**0 of 7**	**6 of 7**	**2 of 7**

Among the four choices (the proposed Project and the three alternatives), the No Project Alternative is the environmentally superior choice. Of the three development options, the Estate Density Alternative has fewer impacts than the proposed Project in five topic areas, and is also environmentally superior to the proposed Project.

5.0 Cumulative, Growth-Inducing, and Irreversible Impacts

Section 15130(a) of the CEQA Guidelines requires a discussion of the cumulative impacts of a project "when the project's incremental effect is cumulatively considerable." Cumulatively considerable, as defined in Section 15065(c), "means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects."

CEQA Guidelines Section 15355 defines cumulative impact as "an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." The Guidelines further state that "an EIR should not discuss impacts which do not result in part from the evaluated project."

Cumulative Impact Approach

According to the Guidelines, an adequate discussion of significant cumulative impacts requires either:

1. A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or,
2. A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact.

This EIR uses the plan-based approach, using information from the City's General Plan and EIR, the City's traffic model, and the Comprehensive Annexation Plan, supplemented with a list of projects that are anticipated to occur, but are not included in these plans. The geographic scope of this cumulative impact analysis is dependent upon the environmental topic area. For example, air quality impacts are evaluated at the regional level, while cumulative noise impacts of the Project are limited to a smaller area around the Project site and adjacent to roadways utilized by Project-related traffic.

Significance thresholds, unless otherwise specified, are the same for cumulative impacts as Project impacts for each environmental topic area.

Cumulatively Considerable Environmental Impacts

Table 5-1 summarizes the cumulatively considerable environmental impacts of the Project; identifies mitigation measures available to reduce impacts, where appropriate; and, characterizes any remaining cumulative impact.

The following cumulative impacts are considered **significant and unavoidable**:

- Loss of rural aesthetic character
- Cumulative air quality impact and adverse impact to air quality planning
- Cumulative biological impacts
- Traffic noise impact
- Cumulative traffic impact

Cumulative Aesthetic Impact

The Project will add to the incremental loss of rural character in the vicinity of the Project site. Development of this and other parcels in the area will permanently transform the visual character of the site from rural and agricultural in appearance to suburban. This impact is **significant and unavoidable.**

Apart from development of an alternative location within the developed portion of the City, no mitigation would feasibly be available to mitigate impacts. As described in the Alternatives section, the search for alternative sites did not produce anything that would be feasible and accomplish the City's Project Objectives (refer to Section 4.0 for more detail).

Cumulative Agricultural Resources Impacts

The Project would result in the conversion of Prime Farmland. Parcels included in the Project site under Solano County's jurisdiction are zoned A-40 (or agricultural use, 40-acre parcels). In addition to farmland directly converted to urban use as a result of the Project, farmland may also be converted indirectly because of growth induced by the Project. The loss of agricultural land affects industries supportive of, or dependent upon agriculture, such as agricultural machinery manufacturers, chemical manufacturers, processors, and people working in retail food trade have jobs that are related to agriculture. Complaints from future Southtown residents may pressure the City to further allow conversion of agricultural lands adjacent to the Project site at an earlier time than what might have otherwise occurred.

However, the City has established a 20-year Urban Services Boundary that includes the Project site. The Project may convert agricultural land to urban use earlier than would have occurred without the Project, but the conversion was planned to eventually occur.

The project would contribute incrementally to farmland conversion occurring at the edge of other Solano County and central valley cities, creating a **potentially significant** impact. However, Mitigation Measure AG-1, which requires securing agricultural conservation easements or similar mechanism, would reduce the Project's contribution to a point where it would be **less than cumulatively considerable**.

Cumulative Air Quality Impact

Development projects are considered cumulatively significant if:

- The project requires a change in the existing land use designation (i.e., general plan amendment, rezone, annexation); or,
- Projected emissions (ROG, NO_x or PM_{10}) of the proposed project are greater than the emissions anticipated for the site if developed under the existing land use designation.

Air quality estimates and pollutant attainment planning in the Air District and Sacramento Valley Air Basin are based on future development and growth characteristics reflected in local planning documents, such as the Vacaville General Plan. If land uses or density is altered through development projects compared to what was included in the General Plan, this would add incrementally to pollutant loading for nonattainment pollutants.

Air quality impacts associated with Project development and development under General Plan designations include emissions released during grading and construction, operation of vehicles, and potential exposure of air pollutants to sensitive receptors (people sensitive to air quality impacts). The General Plan, assuming build-out at the midpoint recommended density, would include more residential units (1,830) than the proposed Project (1,410) at higher densities (see Section 4.0 of this EIR, Alternatives, for more information). In addition, two elementary schools of the Travis Unified School District would be constructed and operated, along with 12 acres of public city parks. A 1,500 foot wide area east of Leisure Town Road would remain undeveloped as a buffer zone, consistent with General Plan policies.

Compared to the proposed Project, the same types of air pollutants would be released during grading and construction, but would be reduced in level compared to the proposed Project since development would occur more gradually, as envisioned in the General Plan. Also, while more homes would potentially be constructed under current General Plan designations, no commercial development would occur. Operational air quality impacts, specifically those related to vehicle emissions, are expected to be lower in the alternative:

- 125 pounds per day for ROG (same as Project emissions)
- 63 pounds per day for NO_x (lower than Project emissions)
- 451 pounds per day for CO (lower than Project emissions)
- 95 pounds per day for PM_{10} (lower than Project emissions)

The higher density of the housing supports alternatives to automobile travel. Siting of schools in the neighborhood would reduce the number and length of school-related trips compared to the proposed Project. The larger number of apartments using General Plan designations causes a reduction in the per-unit trip rate compared to the proposed Project. Overall, the air quality impact of build-out of the Project site under General Plan assumptions would be lower than the proposed Project. This is a **significant and unavoidable** impact.

Carbon monoxide (CO) concentrations can be caused by congested traffic intersections. As shown in the Transportation section of this EIR, Section 3.13, unacceptable traffic levels of service would occur at the following intersections:

- Alamo Drive/Leisure Town Road/Fry Road
- Alamo Drive/Nut Tree Road
- Alamo Drive/Peabody Road
- Vanden Road/Leisure Town Road

- Leisure Town Road/Collector C

Impacts to all intersections except the Alamo Drive/Peabody Road intersection would be reduced to less-than-significant levels through the incorporation of mitigation measures identified in Section 3.13 of this EIR. Although the Alamo Drive/Peabody Road intersection would be impacted, LOS D is estimated whether or not the Project is developed. No feasible mitigation is possible at this intersection. The impact for this intersection is significant and unavoidable. The Project, with incorporation of mitigation, would not create substantial traffic congestion that could create carbon monoxide hot spots. With incorporation of the mitigation measures, the impact is considered **less than significant**.

Cumulative Biological Impact

The Project will add to the incremental loss of habitat for wildlife species identified in Section 3.4 of the DEIR. Development of this and other parcels in the area will permanently remove habitat from use by these species and add to cumulative habitat loss in the area. This impact is **significant and unavoidable.**

Apart from development of an alternative location within the developed portion of the City, no mitigation would feasibly be available to mitigate impacts. As described in the Alternatives section, the search for alternative sites did not produce anything that would be feasible and accomplish the City's Project Objectives (refer to Section 4.0 for more detail).

Cumulative Noise Impact

The Project, during grading and construction, would combine with other construction projects in the nearby vicinity to create a cumulative noise impact. The Project is located on the fringe of the City and is surrounded by agricultural land, a golf course, and other property that is not anticipated to be developed simultaneously. Projects currently under construction to the north of the Project site are not expected to have construction period overlap. The cumulative construction noise impact is **not cumulatively considerable** with incorporation of mitigation measures included in the Noise Section of this EIR, Section 3.8.

The Project would generate a large number of daily automobile trips distributed throughout the roadway network of southeast Vacaville and beyond. The City's traffic model provided the background for the traffic analysis. The Noise section of this EIR, Section 3.8, uses the results of the traffic analysis to identify roadways where Project traffic would contribute to an exceedance of local noise standards for transportation sources. These standards were developed with a consideration of existing noise levels, the community's sensitivity to noise, and recommendations from the State of California for land use noise compatibility. Project traffic noise impacts are summarized below:

- ***Alamo Drive between Nut Tree and Vanden.*** Approximately 17 homes on the south side of Alamo Drive would experience noise in excess of standards. With 2025 traffic conditions, the Project would increase the level of noise directly adjacent to Alamo Drive by approximately one decibel. There are existing soundwalls along this roadway segment. Nonetheless, noise standards may be exceeded. This is considered a **potentially significant** impact.

- ***Alamo Drive between Vanden and Leisure Town.*** Under the 2025 traffic conditions, the Project would increase the noise level by approximately nine decibels. Even with existing soundwalls, which would provide approximately 10 decibels of attenuation, noise standards may be exceeded. This is a **potentially significant** impact.
- ***Alamo Drive east of Leisure Town Road.*** This is an agricultural area – noise standards for agricultural areas are different than those for residential areas or other noise sensitive land uses. The impact is **less than significant**.
- ***Leisure Town Road north of Alamo.*** Soundwalls with berms exist to attenuate noise for homes east of Leisure Town Road. With 2025 traffic conditions, the Project would increase the level of noise directly adjacent to Leisure Town Road by approximately one decibel. Distance attenuation and attenuation from soundwalls with earthen berms would prevent exceedance of noise standards along this roadway segment for existing residences. The impact is **less than significant**.
- ***Nut Tree Road between proposed Collector C and Alamo Drive.*** Existing residences west of Nut Tree Road have soundwalls and earthen berms to reduce noise levels. However, proposed Project homes would be significantly impacted by roadway noise if similar noise attenuation features are not included as a part of the Project. This is a **potentially significant** impact. The existing school on the east side of Nut Tree south of Alamo does not have any soundwall along the roadway, and therefore noise levels on the property would exceed noise standards for school sites. Building attenuation (approximately 20 decibels) and the distance of school buildings from the roadway would ensure that noise levels would not exceed the 45-decibel interior noise limit, at which speech interference would potentially occur. The Project would increase the noise level along this roadway segment by approximately 3 to 4 decibels under 2025 traffic conditions. The impact is **potentially significant**.
- ***Leisure Town Road between Collector C and Collector E, and between Collector E and Alamo Drive.*** Soundwalls or some type of attenuating features would be required for proposed Project single-family residences along Leisure Town Road to meet the 60-DNL noise standard. This is a **potentially significant** impact.

While the Project would be able to include noise barriers or other attenuating features for the noise impacts generated on-site, it is uncertain as to whether the Project would be able to contribute to or construct sound attenuation facilities for all off-site locations where the Project would contribute to a cumulative significant noise impact. This is a **significant and unavoidable** impact.

Table 5-1
Traffic Noise with the Project (without soundwalls)

ROADWAY SEGMENT	2025		
	without Project	with Project	Change
	DNL	DNL	
Alamo Dr/ West of Nut Tree Rd*	69.31	69.76	0.45
Alamo Dr/ Nut Tree Rd to Vanden Rd*	70.33	71.38	**1.06**
Alamo Dr/ Vanden Rd to Leisure Town Rd*	67.41	76.52	**9.11**
Alamo Dr/ East of Leisure Town Rd	66.67	77.93	**11.26**
Nut Tree Rd/ North of Alamo Dr*	69.42	70.01	0.60
Vanden Rd/ South of Leisure Town Rd	69.46	69.54	0.08
Leisure Town Rd/ North of Alamo Dr*	69.20	70.25	**1.05**
Nut Tree Rd/ South of Collector C	65.19	65.99	0.80
Nut Tree Rd/ Collector C to Alamo Dr*	65.19	68.84	**3.66**
Vanden Rd/ Leisure Town Rd to Collector C	67.95	66.70	-1.25
Vanden Rd/ Collector A to Collector B	67.95	60.26	-7.69
Vanden Rd/ Collector A to Alamo Dr	67.95	64.47	-3.48
Leisure Town Rd/ Vanden Rd to Collector C	66.19	66.72	0.53
Leisure Town Rd/ Collector C to Collector E	66.19	67.22	**1.04**
Leisure Town Rd/ Collector E to Alamo Dr	66.19	68.25	**2.06**

Notes: *Soundwalls exist in the project vicinity along roadways to provide attenuation for existing residential areas. The effectiveness of these soundwalls was modeled as a part of the noise analysis that supports this EIR, as explained above. Within the Project site, normal walls without berms were modeled. Traffic noise modeled assuming no grade and at 43 feet from the centerline of each roadway. Along some of the roadways, such as Leisure Town Road north of Alamo Drive, some of the existing residential properties have wider rights-of-way with sidewalks, soundwalls, and earthen berms.

Source: LEVQ2, courtesy of the California Department of Transportation; traffic data from Fehr & Peers, 2003; modeled by Cotton/Bridges/Associates, 2003 using methods of the Federal Highway Administration *Highway Traffic Noise Model*, 1978.

Cumulative Traffic Impact

The Project is analyzed in the Transportation section of this EIR, Section 3.13, under the 2025 scenario, using the City's traffic model and land use projections to take into account all current and future projects that may become established during and after Project build out. This establishes the cumulative traffic conditions, allowing cumulative traffic impact assessment. As demonstrated in Section 3.13, several mitigation measures are available that would reduce impacts to all intersections and roadways, with the exception of the Alamo Drive/Peabody Road intersection. Though the Project would add traffic to the Alamo Drive/Peabody Road intersection, unacceptable levels of service are predicted for 2025 whether or not the Project is developed. No feasible mitigation is possible at this intersection. The cumulative impact is **significant and unavoidable.**

Other Cumulative Impacts

No other cumulative impacts were identified through comprehensive cumulative impact assessment.

Table 5-2
Cumulative Environmental Impacts

Topic	Impact	Mitigation Measures (where appropriate)	Cumulative Level of Significance with Mitigation
Aesthetics	Loss of rural character	None available	Significant and unavoidable
Agricultural Resources	Loss of farmland	Mitigation Measures included in the Agricultural Resources section of the EIR, Section 3.2, reduce cumulative impacts	Less than cumulatively considerable
Air Quality	Operational emissions – ability to achieve air quality attainment	Feasible mitigation measures are not available that would reduce project long-term air quality impacts to a less-than-significant level.	Significant and unavoidable The Project, in combination with Annexation Area development will cause air pollution that will inhibit the region's ability to achieve O_3 and PM_{10} attainment.
Biological Resources	Loss of habitat	None available	Significant and unavoidable
Circulation	Level of service impacts to area intersections and roadway segments	None other than that which is required in the Transportation Section, Section 3.13 of this EIR.	Significant and unavoidable
Noise	Grading and construction noise impact on nearby land uses	None other than that which is required in the Noise section of this EIR, Section 3.8	Less than significant
	Traffic noise impact	None other than that which is required in the Noise section of this EIR, Section 3.8	Significant and unavoidable

Growth-Inducing Impact

Residential and commercial development induces growth by providing places for new residents to live, expanding the labor pool, or increasing the local supply of jobs. Extension of public infrastructure or services accommodates growth by removing constraints to development. Growth inducement can be direct or indirect:[1]

A growth-inducing project directly or indirectly...

- Fosters economic or population growth or additional housing
- Removes obstacles to growth
- Taxes community services or facilities to such an extent that new services or facilities would be necessary
- Encourages or facilitates other activities that cause significant environmental effects

The Project induces growth by locating residences and commercial establishments outside of the current City limits, proposing amendments to the General Plan, extending the roadway network, sewer facilities, water facilities, and related utilities to a previously unserved portion of the City and unincorporated County, contributing additional residential population that will require jobs and adding jobs that will require employees, and establishing urban uses adjacent to ongoing agricultural operations, which may encourage further conversion of agricultural land.

The Southtown Project would convert approximately 300 acres of rural land to urban land uses. The Project is located outside the current city limits but inside the urban service area identified within the current Comprehensive Annexation Plan (CAP) as an area for annexation between 2006 and 2015.

The Project may induce substantial population growth through the extension of public services and circulation improvements into an area that currently does not have access to these amenities. However, the City has adopted policies in the General Plan elsewhere meant to limit unnecessary geographic expansion of the city and associated environmental issues. The annual residential allocation system established by the Planned Growth Ordinance limits population growth. Other mechanisms that serve to regulate growth include provisions associated with development agreements and the requirement for payment of development fees.

Compliance with provisions established by the City of Vacaville will result in the avoidance of substantial growth-inducing impacts.

Significant Irreversible Environmental Changes

The development of this site, and the future activities accommodated by the development of the site will result in the expenditure of non-renewable resources. Raw materials will be used to construct the new facilities and water, energy, and fossil fuels will be used in operations of the school. Development of the Project will convert former agricultural land to urban use and will adversely affect any wildlife currently living on the Project site. The significance of the Project's environmental impacts is characterized in the Environmental Analyses sections, 3.1 through 3.13, including both reversible and irreversible impacts.

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[1] Bass, Herson, and Bogdan. *CEQA Deskbook*. 2001.

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