

Draft

ZONE 7 STREAM MANAGEMENT MASTER PLAN

Environmental Impact Report



Prepared for:
Zone 7 Water Agency

March 2006



March 17, 2006

Notice of Availability

Stream Management Master Plan Cities of Livermore, Dublin, and Pleasanton and Alameda County Draft Master Environmental Impact Report

Notice is hereby given that a Draft Master Environmental Impact Report (MEIR) for the Stream Management Master Plan is available for public review. The project proponent is the Zone 7 Water Agency (Zone 7), 100 North Canyons Parkway, Livermore, California, 94551. The lead agency is Zone 7, Livermore, California.

The purpose of the Stream Management Master Plan (SMMP) is to develop a master plan that addresses flood protection and drainage issues, as well as other issues affecting management of the streams and arroyos in the Livermore Amador Valley. The SMMP includes 45 individual projects intended to be multidisciplinary, that is, they are intended to meet several of the resource area goals and objectives in order to provide benefits in a number of areas in addition to the primary purpose of flood protection. The SMMP identifies opportunities for other local agencies and Zone 7 to implement projects and activities that serve to meet the regional issues and needs of the Livermore Amador Valley. In general, the SMMP would provide adequate flood protection in the channels in the project area through implementation of regional storage, sediment removal, low-flow channel installation, wetland creation, and riparian corridor enhancement to provide bank stabilization.

Analysis of environmental impacts associated with the SMMP identified potentially significant impacts, primarily temporary impacts resulting from construction activities, in the following areas: hydrology and water quality; geology, soils, and seismicity; land use and planning; biological resources; fisheries; air quality; noise and vibration; traffic and circulation; hazards and hazardous materials; utilities; historic resources; and aesthetics. Growth inducement potential, secondary effects of growth, alternatives to the project, and cumulative impacts are also addressed in the Draft MEIR. For environmental impacts determined to be significant or potentially significant, mitigation measures have been identified to reduce those impacts.

The Draft MEIR, prepared pursuant to the California Environmental Quality Act, is available for public review at the following locations:

Zone 7 Water Agency
100 North Canyons Parkway,
Livermore, CA 94551

City of Pleasanton Library
400 Old Bernal Avenue
Pleasanton, CA 94566

Dublin Library
200 Civic Plaza.
Dublin, CA 94568

Livermore Public Library Locations

Civic Center
1188 South Livermore Avenue,
Livermore, CA

Rincon
725 Rincon Avenue,
Livermore, CA

Springtown
998 Bluebell Drive,
Livermore, CA

The Draft MEIR will also be available on Zone 7's website at www.zone7water.com. Persons interested in reviewing the Draft MEIR, receiving a copy of the document, or in reviewing documents referenced in the MEIR, are invited to contact Joe Seto, Senior Engineer, Zone 7 Water Agency at 925-454-5000.

PUBLIC MEETINGS. Zone 7 will be conducting a public workshop for the project on **April 26, 2006** from **5 p.m. to 7 p.m.** at Zone 7 Water Agency, 100 North Canyons Parkway, Livermore, California, 94551. More information will be available on Zone 7's website at www.zone7water.com.

DEADLINE. Comments must be received by at **5:00 p.m. on May 1, 2006**. Submit comments in writing to Joe Seto, Senior Engineer, Zone 7 Water Agency, 100 North Canyons Parkway, Livermore, California, 94551. Action on the Draft MEIR is currently scheduled to be taken by the Zone 7 Board of Directors at a regularly scheduled board meeting in July 2006 at 100 North Canyons Parkway, Livermore, California.

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SUMMARY

S.1 Introduction

This Master Environmental Impact Report (MEIR) assesses the potential impacts of the Stream Management Master Plan (SMMP) developed by the Zone 7 Water Agency (Zone 7). The purpose of the SMMP is to address flood protection and drainage, as well as other issues affecting management of the streams and arroyos such as dry channels that are subject to flash flooding during seasonal or irregular rain storms.

This document has been prepared in accordance with the California Environmental Quality Act (CEQA) of 1970 (as amended), the State EIR guidelines, and California Administrative Code, Title 14, Division, Chapter 3. Zone 7 is the lead agency for this CEQA process. Inquiries about the project should be directed to:

Joe Seto
Zone 7 Water Agency
100 North Canyons Parkway
Livermore, CA 94551
Telephone: 925-454-5000

S.2 Project Background

Zone 7's service area comprises approximately 426 square miles in eastern Alameda County and includes the cities of Pleasanton, Livermore and Dublin as well as the surrounding lands in unincorporated Alameda County. Zone 7 provides water supply to a population of approximately 190,000; this population is projected to increase to 253,000 by 2030.

As the Livermore-Amador Valley's water wholesaler, Zone 7 sells treated water primarily to four retail water agencies: the City of Pleasanton, the City of Livermore, the Dublin San Ramon Services District (DSRSD), and the California Water Services (CWS) Company. Zone 7 also sells untreated water directly to agricultural customers.

In addition, Zone 7 maintains certain improved flood control channels and improves or supports the improvement of existing major drainage channels as possible. Currently, Zone 7 owns and maintains approximately 39 miles of the major drainageways, flood control channels and streams (including arroyos) on the Valley floor. **Figure 2-2** shows the channels owned by Zone 7. The Special Drainage Area (SDA 7-1) Program, which is funded by developer fees, is currently the sole source of revenue for Zone 7 to expand or improve the existing flood control system.

Zone 7 also, as possible, provides maintenance and emergency repairs of channels that it owns in order to ensure the channels are ready to convey flows. These activities are funded through property taxes. There are three types of maintenance activities: routine maintenance, major maintenance, and emergency maintenance.

S.3 Project Description

Zone 7 has developed the SMMP to serve as an update to the existing 1966 Flood Control Master Plan and to identify several additional objectives related to flood control facility improvements and stream management within its service area. In recent years, there have been a number of changes, including regulatory changes, environmental considerations, and funding opportunities, that impact the way agencies approach the management of streams and flood control channels. In recognition of these changes, Zone 7 began development of the SMMP in September 2002. The purpose of the SMMP is to develop a master plan that addresses flood protection and drainage issues, as well as to identify other issues and alternatives for management components within the major stream courses in the service area. The SMMP study area includes all arroyos and flood control channels located within 426 square miles of the Alameda Creek watershed inside the Zone 7 service area (see **Figure 2-1**).

The SMMP includes 45 individual projects intended to be multidisciplinary, that is, they are intended to meet as many of the resource area goals and objectives as possible in order to provide benefits in a number of areas in addition to the primary purpose of flood protection. The SMMP identifies opportunities for other local agencies and Zone 7 to implement projects and activities that serve to meet the regional issues and needs of the Valley. **Chapter 2, Project Description**, provides a list of individual projects and resource areas addressed by each project and includes a summary description of project purpose, components, and resource area goals in each project area. To effectively identify SMMP needs and opportunities, the Zone 7 service area was divided into 12 individual reaches that span the cities of Livermore, Dublin, Pleasanton, and other areas in unincorporated Alameda County (see **Figure 2-1 and Chapter 2, Project Description** for details).

In general, the SMMP would provide adequate flood protection in the channels in the project area through implementation of regional storage, sediment removal, low-flow channel installation, wetland creation, and riparian corridor enhancement to provide bank stabilization. Projects implemented under SMMP would develop regional storage at the existing Lake G and Cope Lake, and would implement one-time sediment removal on a project-by-project basis to reestablish channel capacity for approximately 19,000 linear feet of channel. Other channel capacity improvements would include use of flood walls along the top of existing embankments, channel widening, and removal of in-channel maintenance roads to improve channel capacity. SMMP implementation would also include the following riparian and habitat enhancements to existing stream channels: establishment of 40,000 linear feet of low-flow channel, implementation of riparian planting and vegetation management along 76,300 linear feet of channel bank, and application of invasive species control along 21,000 linear feet of channel bank. To more effectively manage sediment deposition and removal, the SMMP includes

establishment of 6 sediment basins, and includes implementation of bio-technical bank stabilization along approximately 61,500 linear feet of channel bank to reduce bank failure and erosion. The SMMP includes creation of 28 acres of in-stream and off-channel wetlands, dedication of 22 acres for habitat conservation, and dedication of 146 acres of land for floodplain management. The SMMP would remove 10 existing fish barriers within the Upper Alameda Watershed, and would create 36.7 miles of multi-use recreational trail along existing stream channels. The SMMP would also include routine maintenance activities such as sediment removal, bank stabilization, and maintenance of flood control structures and equipment. Chapter 2, Project Description describes the maintenance activities in detail.

S.4 Project Objectives

Zone 7 manages the stormwater flows into the Livermore-Amador Valley area within the major drainage ways of the Valley floor. Zone 7 owns approximately 39 miles of both improved and unimproved channels that are part of the area's major drainage ways which drains the 426 square miles of the Alameda Creek watershed. Those channel reaches and areas within Zone 7 ownership are maintained and repaired by Zone 7 within available resources and regulatory constraints.

Within its local areas, Zone 7 is responsible for managing flood flows in the Livermore-Amador Valley in the best available way. As this valley becomes transformed from rural to suburban land uses, the potential for stormwater runoff to exacerbate the potential for localized flooding is expected to increase. The SMMP addresses alternatives to maximize flood control, while also considering other resource areas affected by management of flood channels and arroyos. Specific SMMP goals for each resource area are presented in **Table S-1, below**. These goals and objectives guide the development of individual projects identified under the SMMP.

**TABLE S-1
SMMP RESOURCE GOALS**

Resource Area	SMMP Goal
Flood Protection and Drainage	Protect people, property and stream corridors from damaging drainage and floods
Erosion and Sedimentation	Reduce or manage erosion and sedimentation in a manner that is compatible with other stream resources
Water Supply	Provide adequate conveyance of water for recharge and storage needs
Water Quality	Protect and enhance water quality of streams and groundwater
Habitat and Environment	Protect and enhance aquatic and riparian habitat associated with streams and wetlands
Trails, Recreation, and Public Education	Promote recreational, alternative transportation, and public education opportunities along streams and the Chain of Lakes

S.5 Role of the Master EIR

CEQA Guidelines Section 15169 states that, “a public agency may prepare a master environmental assessment, inventory, or database for all, or a portion of, the territory subject to its control in order to provide information which may be used or referenced in EIRs or negative declarations.” According to Section 15175 (a), the Master EIR is intended to streamline the later environmental review of projects, or, approval included within the project, plan, or program analyzed in the Master EIR. A Master EIR shall, to the greatest extent feasible, evaluate the cumulative impacts, growth inducing impacts, and irreversible significant effects on the environment of subsequent projects. According to Section 15175 (b) one of the classes of projects that a lead agency may prepare a Master EIR for is a project that consists of smaller individual projects that will be carried out in phases such as the proposed SMMP.

In compliance with Section 15000 of the CEQA Guidelines, Zone 7 has prepared this Master Environmental Impact Report (MEIR) that examines potential impacts associated with implementation of the SMMP. Zone 7 intends to utilize this MEIR to complete the public review process required under CEQA for the SMMP. Implementation of individual projects will be reviewed under the MEIR for the need to complete additional project-specific environmental documentation.

S.6 Summary of Impacts and Mitigation

Table S-2, at the end of this chapter, presents a complete list of the impacts and mitigation measures identified for the SMMP. Impacts are related to the construction or operation of the SMMP and the individual projects. **Chapter 3, Environmental Setting, Impacts, and Mitigation Measures**, presents a discussion associated with these impacts. The level of significance for each impact was determined using significance criteria (thresholds) developed for each category of impacts; these criteria are also presented in the appropriate sections of Chapter 3. Significant impacts are those adverse environmental impacts that meet or exceed the significance thresholds; less-than-significant impacts are the impacts that would not exceed the thresholds. **Table S-1** indicates the measures to avoid, minimize, or otherwise reduce significant impacts to less-than-significant levels.

S.7 Analysis of Alternatives

The CEQA Guidelines require an EIR to describe and evaluate a range of reasonable alternatives to a project, or to the location of a project, which would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. **Chapter 6, Analysis of Alternatives**, evaluates the potential alternatives to the proposed project. Potential alternatives examined for the proposed project include:

- No Project Alternative – Existing Conditions
- Buildout of 1966 Master Plan via Special Drainage Area 7-1 Program funding

- Flood Detention and Conveyance Alternative, i.e., including only the minimum projects required to meet the basic project need to maintain some level of flood protection during a 100-year storm event.

S.8 Cumulative Impacts

The CEQA Guidelines require that EIRs discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects.

Chapter 5, Cumulative Impacts, evaluates the significant cumulative impacts resulting from the implementation of the SMMP in combination with other projects or conditions, and indicates the severity of the impacts and their likelihood of occurrence. The chapter adopts a 'plan' approach that discusses the projections in the general plans that cover the project area and future buildout within the Valley. This approach is needed due to the absence of precise project plans and construction schedule. The chapter primarily addresses general cumulative impacts that could result from concurrent implementation of the proposed project along with other planned projects in the vicinity.

S.9 Secondary Effects of Growth

The CEQA *Guidelines* require that an EIR evaluate the growth-inducing impact of a proposed action. **Chapter 4, Growth Inducement Potential and Secondary Effects of Growth**, evaluates the secondary effects of growth associated with the implementation of this project. This project provides for regional flood protection within the existing urbanized areas within Zone 7's service area. As such, implementation of the SMMP would not affect the rate, location, or timing of growth within the Zone 7 service area. Projected growth under the adopted General Plans within the Zone 7 Service Area and the secondary effects of that growth were evaluated in the *Zone 7 Water Supply Planning Program EIR* (certified on January 21, 1999, SCH# 98041040). Conclusions of this analysis would not be affected by implementation of the SMMP.

**TABLE S-2
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Significance After Mitigation
Hydrology and Water Quality		
3.2.1. Erosion. Project construction could result in increased erosion and sedimentation, which could increase turbidity and decrease water quality in surface waterways. Less than Significant with Mitigation.	3.2.1a: Zone 7 shall submit an NOI to the RWQCB to comply with the NPDES Construction Activity Storm Water Permit requirements. Zone 7 or its contractors shall prepare and implement a SWPPP for individual projects prior to project construction. Preparation of the SWPPP shall be the responsibility of Zone 7, and implementation of the SWPPP shall be the responsibility of the contractor hired to perform the work. The SWPPP shall incorporate construction BMPs. Typical BMPs in the SWPPP could include, but would not be limited to the following: • Prior to any excavation, determine whether the depth and extent of excavation would likely encounter contaminated soils and groundwater. • Retain, protect and supplement native vegetation wherever possible. Exposure of soil areas shall be limited to the immediate area required for construction operations. • Grading areas should be clearly marked and no equipment or vehicles shall disturb slopes or drainages outside of the grading area. • Use barriers to contain runoff around excavation sites. • If unreported contaminated soil is encountered during excavation, carry out appropriate remediation of soils in contained areas or covered areas, or remediated through treatment prior to initiating excavation. • Filter runoff onsite using silt fences, desiltation ponds, baker tanks, and other appropriate control measures. • Install temporary (or permanent) stormwater retention or detention structures in which treatment can occur. • No stockpiling of excavated soil or other materials shall occur in stream channels. No excavated soil or other materials shall be disposed of instream channels, but should be hauled away for proper disposal. Care should be taken to ensure that pollutant spills do not occur in stream channels. For example, changing of oil or other fluids should not be performed in the vicinity of stream channels. • Use tarps to cover any excavation soils storage during the October-April rainy period. • After completion of slope grading, erosion protection shall be provided and must include slope planting. Revegetation shall be facilitated by mulching, hydroseeding or other methods, and shall be initiated as soon as possible after completion of grading, and prior to November 1st. Improvement of slopes shall involve ground coverings. Selection of plant materials shall consider native plantings and shall encourage shrubs and trees as a long-term erosion control feature.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Hydrology and Water Quality (cont.)		
3.2.1. (cont.)	The SWPPP shall be kept onsite during construction activity and made available upon request to a representative of the RWQCB. Zone 7's contractor shall conform to the contract specifications addressing stormwater pollution prevention and shall follow all BMPs identified in the project SWPPP at all times during construction. 3.2.1b: In order to reduce the potential for erosion and sedimentation, on-channel construction shall be limited to the dry season annually, from April 15th to October 15th, subject to agreement and permit issuance from appropriate regulatory agencies.	
3.2.2. Dewatering. Construction activities for the SMMP could include dewatering, that could result in the discharge of turbid waters into the local storm drain systems or nearby creeks and arroyos. Such a discharge would result in potentially significant impacts. Less than Significant with Mitigation.	Implement Mitigation Measure 3.2.1a.	Less than significant.
3.2.3. Increased Storm Runoff. Construction of individual projects, particularly trail construction, would result in a minor increase in local storm runoff volumes. Less than Significant impact.	No Mitigation Measures Required.	
3.2.4. Sediment Transport: Implementation of the SMMP would not significantly alter the total volume of sediment transported from the upper Alameda Creek watershed and discharged to Alameda Creek via ADLL. Moreover, implementation of the SMMP would beneficially sequester fine sediments (i.e., silts and sands) by directing flows to retention at Cope Lake and Lake G (part of the Chain of Lakes) during 7-year or less frequent storm events; this is expected to be beneficial in terms of potential water quality impacts. Less than Significant; Beneficial Impact.	No Mitigation Measures Required.	
3.2.5. Localized Bed Erosion and Sedimentation: Implementation of certain types of SMMP projects could potentially impact localized bed erosion and sedimentation processes. Less than Significant with Mitigation.	3.2.5a: Sediment Transport Analysis. All projects implemented under the SMMP involving levee construction, bank stabilization, sediment or flow detention, and/or flow diversion shall prepare a project-specific sediment transport and geomorphic analysis. The purpose of the analysis will be to review proposed designs within the context of regional sediment transport. 3.2.5b: Establish Regional Design Criteria. The SMMP shall include development of a comprehensive set of design criteria for Zone 7 facilities to ensure that sediment transport is accounted for in facility design, and to avoid sediment deposition upstream of transitional structures. To the extent feasible, these design criteria should be coordinated with other municipalities with ownership or jurisdiction of facilities within the SMMP project area.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Hydrology and Water Quality (cont.)		
3.2.6. Regional Flooding: Establishment of regional detention storage at Cope Lake and Lake G would provide adequate conveyance capacity to maintain 100-year flows within channels, thereby providing 100-year flood protection within the SMMP project area. This would reduce areas that are currently within the mapped 100-year floodplain and is expected to be beneficial in terms of potential regional flooding impacts. Beneficial Impact.	No Mitigation Measures Required.	
3.2.7. Altered Flow Regime: Operation of the SBA Turnout project on Arroyo Mocho (R.3-1) and the Sycamore Grove Recharge Bypass project on the South Tributary of Arroyo del Valle (R.4-1) could result in altered flow regimes for these channels. Less than Significant with Mitigation.	3.2.7a: Prior to implementation of Projects R.3-1 and R.4-1, an assessment of channel condition and response potential will be conducted. Such an assessment will be conducted based upon the proposed operations schedule and rate of proposed releases from the SBA into these reaches. At the least, the channel assessment should comprise an evaluation of the hydraulic geometry of the reach and a characterization of the bed (i.e., pebble count) and bank substrate. From this assessment, and given a range of proposed rates and durations of flow, the release schedules would be modified (or verified) such that no affect on channel stability would be expected. In particular, further examination of the hydrologic effects at the debris dam location would be necessary prior to implementing Project R.4-1.	Less than Significant
Geology and Soils		
3.3.1. Erosion: Construction of proposed facilities could result in short-term impacts associated with erosion and sedimentation. Less than Significant with Mitigation.	Implement Mitigation Measures 3.2.1a and 3.2.1b.	Less than Significant
3.3.2. Ground shaking: In the event of a major earthquake in the Bay Area Region, proposed facilities could be subject to ground shaking capable of causing localized collapse or damage of engineered fills, or structural damage. Less than Significant with Mitigation.	3.3.2a: Site- Specific Geotechnical Investigation. Construction projects requiring engineering considerations and evaluations shall be determined on a project by project basis depending on scope and applicability to building code requirements. Recommendations and design criteria included in a geotechnical investigation shall be incorporated into the construction specifications of the applicable project. Design criteria shall comply with applicable standards and requirements of the most recent California Building Code (Title 24). As part of any geotechnical investigation, if appropriate, soils at foundation or base grade shall be sampled and laboratory tested to determine the expansion potential of each soil. The study shall also evaluate the potential for unstable soils and design criteria shall be implemented as part of that project Project-specific surveys, if applicable, shall be performed on a project basis to determine the potential for liquefiable soils. If the project-specific studies determine a strong potential for severe damage to the proposed project, recommendations of the geotechnical report would be incorporated into the construction specifications. Recommendations could include but are not limited to compaction grouting or other in-situ densification of loose sandy or silty layers.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Geology and Soils (cont.)		
3.3.3. Slope Failures: Proposed facilities may be exposed to slope failures including landslides, earthflows, and rapid erosion. The flatland areas are susceptible to expansive soils and that may lead to settlement or damage to facilities. Less than Significant with Mitigation.	Implement Mitigation Measure 3.3.2a.	Less than Significant
Land Use		
3.4.1. Land Use Disturbance: Project construction would result in short-term disturbance to adjacent land uses in the immediate vicinity of individual project sites. Less than Significant with Mitigation.	3.4.1a: Construction activities associated with project implementation shall occur Monday through Friday, between 8:00 a.m. and 5:00 p.m. This limitation would reduce disturbance (i.e., dust, noise, traffic) to adjacent land uses. Any construction that disrupts traffic within primary roadways shall be limited to weekdays during non-peak hours (see Section 3.9, Traffic and Circulation). 3.4.1b: Zone 7 shall restore private access roads, driveways, and landscaped areas that would be affected by construction activities to their pre-project condition such that adverse effects to the physical conditions of the work sites would not result in continued disturbance or new safety hazards. Restoration of private property shall require negotiations between Zone 7 and private landowners. 3.4.1c: Zone 7 shall restore public road right-of-ways and recreational facilities that would be affected by construction activities to their pre-project condition such that adverse effects to the physical conditions of the work sites would not result in continued disturbance or new safety hazards. 3.4.1d: If project sites are located in a public right-of-way, Zone 7 or its contractors shall obtain and comply with encroachment permits for installation of facilities. In addition, Zone 7 shall provide the local jurisdiction with design drawings for review and comment at appropriate design stages. 3.4.1e: If project locations are located adjacent to schools or community parks and centers, construction schedules shall be negotiated with the respective school districts and affected agencies in an effort to minimize disturbance to school and community operations and programs. Where construction activities would affect scheduled programs, Zone 7 shall work with affected jurisdictions to establish alternative locations for activities curtailed by project construction. For those activities that are not able to be temporarily relocated due to special facility requirements, Zone 7 shall work with affected jurisdictions to establish alternative scheduling on evenings and weekends.	Less than Significant
3.4.2. Recreational Facility Use Disturbance: Project construction could result in disturbance of recreational facility uses. Less than Significant with Mitigation.	3.4.2a: If projects are located within parks or other recreational facilities, Zone 7 shall notify and coordinate with affected jurisdiction to obtain approval for encroachment. To the extent feasible, construction activities shall be conducted in a way that does not impair existing recreational uses in parks. In addition, Zone 7 or its contractors shall post signage within affected park areas describing the length of duration, time of construction activities, and contact person. Construction areas would be appropriately fenced, and equipment would be stored within the fence zone, to provide safety to park users.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Land Use (cont.)		
3.4.3. Adjacent Land Use Disruption: Project implementation could result in long-term disruption to adjacent land uses, including incompatibility with existing land uses and increased dust, noise, traffic and other disturbance to surrounding land uses. Less than Significant.	No Mitigation Measures Required.	
3.4.4. Mineral Resources: Project implementation could result in loss of availability of the Chain of Lakes area, which is a known mineral resource of value to the region. Less than Significant. Less than Significant with Mitigation for Projects R.5-3 and R.6-2.	3.4.4: For Project R.5-3 and Project R.6-2, Zone 7 shall continue to coordinate with gravel mining lease holders and operators regarding design and implementation of regional flood control facilities in the Chain of Lakes area.	Less than Significant
Biological Resources		
3.5.1. Wetlands and Riparian Vegetation: During construction activities, SMMP improvements could impact in-stream wetlands and riparian vegetation during sediment removal and vegetation management. Category 1 Projects: Less than Significant with Mitigation; Category 2 Projects: Significant and Unavoidable.	3.5.1a: Where feasible, Zone 7 shall avoid and minimize disturbance of in-stream wetlands and riparian vegetation in the SMMP project area as a focus of project design and construction. The preferable form of mitigation recommended by the Corps and CDFG is avoidance of jurisdictional waters and riparian vegetation. All excavation activities associated with recontouring stream banks, instream sediment removal, removal of structures, or native vegetation management would be limited to the minimum area necessary to complete the work. Identification and protection of wetlands and drainages would be implemented consistent with the provisions of Mitigation Measure 3.5.1b. 3.5.1b: Zone 7 shall compensate for the loss of jurisdictional waters through the development and implementation of a comprehensive Wetland Mitigation Plan. The Wetland Mitigation Plan shall include one or more of the following mitigation strategies, in descending order of importance. 1. <i>Restoration, rehabilitation, or enhancement of drainages and wetlands in areas on-site that remain unaffected by project activities or off-site at one or more suitable locations within the project region:</i> Onsite restoration, rehabilitation, and enhancement: Streams and wetland habitat in the SMMP project area have suffered varying degrees of degradation due to past stream management, straightening and channelization, and the removal of riparian habitat. Onsite wetland habitat could be restored, rehabilitated, or enhanced as mitigation for losses to function with a focus on restoring or enhancing function of degraded stream reaches.	Less than significant with mitigation for all Category 1^a projects and potentially beneficial for several Projects that result in long-term net wetland or riparian habitat enhancement. Significant and unavoidable for Category 2^b Projects R.8-2, R.9-2 and R.9-3 due to permanent, unmitigable wetland losses. Additionally, the overall unmitigated loss of wetland habitat for the SMMP is estimated at roughly 24 acres. Therefore, impacts related to wetland loss are considered significant and unavoidable at the MEIR level.

^a Category 1: Minimal to Moderate Impacts to Wetlands or Riparian Habitat.

^b Category 2: Extensive Impacts to Wetlands or Riparian Habitat.

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
3.5.1. (cont.)	Offsite restoration, rehabilitation and enhancement can consist of either rebuilding or re-establishing former waters or rehabilitation of degraded waters. The former activity results in a net increase in acreage, while the latter does not. However, both aspects of restoration result in a net increase in wetland functions. While enhancement activities do not result in an increase in acreage, their objective is to provide a net gain in wetland or riparian function. Under this strategy, restoration, rehabilitation, or enhancement activities would optimally occur on lands that are protected and not subject to future flood control maintenance, such as the Springtown Natural Community Reserve or East Bay Regional Park lands. Such lands would contain streams and/or wetlands in need of restoration or enhancement and capable of having functions similar to or higher than those lost due to development as a result of SMMP projects. 2. <i>Creation of onsite or offsite drainages or wetlands at a minimum of a 1:1 functional equivalency or acreage ratio (as verified by the Corps):</i> Onsite wetland creation: New drainages or wetlands, as appropriate, could be created onsite, in areas protected from development that would replace lost functions including drainage, flood water detention, and support of wetland dependent plants and animals. Offsite wetland creation: Wetlands could also be created in suitable off-site locations, including a project-specific or otherwise designated mitigation bank. The following guidelines shall be adhered to whether created wetlands are located on- or off-site: - Corps guidelines encourage the selection of a mitigation site with natural hydrology and soils suitable for supporting wetland or riparian vegetation; therefore, an analysis of local watersheds, runoff patterns that would contribute water to the wetlands, and local soils shall be conducted prior to wetland design. - Created wetlands or drainages shall be excavated topographic depressions designed to fill with and/or convey seasonal rainfall and local runoff. - Following excavation, wetlands or drainages shall be seeded or planted with appropriate native wetland plants of local genetic stock and then allowed to establish naturally. - Wetlands or drainages shall be created within larger upland areas left in a natural state as a buffer and a buffer zone of a minimum of 50 feet from wetland borders shall be preserved.	

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
3.5.1. (cont.)	v. One purpose of these wetlands or drainages will be to provide natural habitat values. Therefore, landscaped ponds shall not be considered acceptable mitigation for loss of wetland habitat. vi. Long-term vegetation maintenance shall be provided in the form of weeding, watering, and replanting as necessary. vii. Created wetlands or drainages shall be monitored for a minimum of 5-years to ensure that wetland conditions are achieved (i.e., successful establishment of native wetland plants and hydrologic regime) in accordance with the conditions of State and/or Federal permit approvals. viii. Mitigation and monitoring reports shall be prepared annually. 3. <i>Purchase of credits in an authorized mitigation bank acceptable to the Corps, CDFG and USFWS.</i> The purchase of mitigation bank credits and the addition of land or other contribution to an already existing mitigation bank may result in greater overall habitat and resource value than would smaller parcels of land set aside for mitigation at the margins of developed areas within the project area. 4. <i>Contributions in support of restoration and enhancement programs located within the project region,</i> such as the Alameda Creek Fisheries Restoration Workgroup; or regionally based organizations, such as The Nature Conservancy; or supporting appropriate state and federal conservation efforts such as CDFG or USFWS conservation efforts in the region. For example, under certain circumstances the Corps has determined that greater resource protection and conservation benefits may be achieved by gathering funds in lieu of actual required mitigation actions and allocating such in-lieu fees to independent conservation projects that will offset wetland impacts resulting from the authorized activity (U.S. Army Corps of Engineers, 2000).	
	According to the recent guidance from the Corps (U.S. Army Corps of Engineers, 2002), compensatory mitigation should be based, if feasible, on functional equivalency. While the Corps has traditionally used acreage as the standard measure for determining impacts and required mitigation, the agency is now renewing its focus on wetland function and encouraging the use of functional assessment methods to measure impacts and mitigation. In any one case, the same approach must be used to determine losses and gains, in terms of amounts, types, and locations, for describing both impacts and compensatory mitigation. Therefore, for each project a functional assessment should be made by qualified professionals using techniques generally accepted by experts in the field and fully considering the ecological functions included in the 404 (b)(1) Guidelines. The objective of such an assessment is to provide, at a minimum, a one-to-one functional replacement for losses in wetland function, including an adequate margin of safety to reflect anticipated success. In cases where functional assessment is not practicable or feasible or where definitive information on the functions of a particular wetland or stream is lacking, a minimum one-to-one acreage may be used as a reasonable surrogate for no net loss of functions.	

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
3.5.1. (cont.)	A focus on replacing wetland functions, rather than simply calculating the acreage affected by development, will in most cases provide a more accurate and effective way to achieve the environmental performance objectives of the Corps' no net loss policy and provide greater opportunity for development of a balanced mitigation package that may contain multiple components, including both on-site and off-site components as described below. For SMMP creek rerouting projects or stream widening projects, the banks or channel bottom will require extensive replanting and/or wetland creation. Restoration has been demonstrated to be more feasible and successful than creation of wetlands. Therefore, in any wetland mitigation plan, restoration should be emphasized first, then enhancement, and lastly creation or preservation, when no other options exist. In the event that potential impacts to jurisdictional waters are anticipated, compensation for loss of jurisdictional waters would be based on a verified wetland delineation of the area in question. During the permit application process for specific project components with identified impacts on jurisdictional waters, Zone 7 shall consult with the Corps, CDFG, and the Regional Water Quality Control Board (RWQCB) regarding the most appropriate assessment and mitigation methods to adequately address losses to wetland function that may occur as a result of the proposed project. A Wetland Mitigation Plan would be developed during the permit process, prior to project implementation and would include one or more of the mitigation plan strategies identified in Impact 3.5.1 discussion. The Plan would be submitted to permitting agencies for their approval. When technically feasible, mitigation work proposed in existing wetlands or drainages on- or off-site in the project region shall occur prior to commencement of construction activities at the project site, or immediately thereafter. Purchase of mitigation bank credits and contributions towards restoration or enhancement programs also shall be made prior to project implementation.	
3.5.2. Heritage And Other Significant Trees: Construction of proposed facilities could result in impacts to heritage or other significant trees in the SMMP area. Less than Significant with Mitigation.	3.5.2a: For projects where the removal of heritage or other significant trees is eminent, Zone 7 shall conduct a tree survey of each project area and retain such trees in the project area to the extent possible. 3.5.2b: As appropriate, permits shall be obtained from the county and local municipalities to remove trees. As required by local municipalities or the County, mitigation may include replacing disturbed or removed trees or compensating the County for the appraised value of the impacted trees, or replanting trees at the same location following construction. Maintenance of the replanted trees until established may be required to ensure survival	Less than Significant
3.5.3. Riparian Vegetation: Construction of the proposed hardscape bank protection at three locations (Chabot Canal, Line F-4, and Line J channels) would cause a loss of riparian vegetation functions and values. This could permanently impact the quality and availability of wildlife habitat following construction. Significant and Unavoidable.	3.5.3a: To the extent practicable, Zone 7 shall avoid and minimize use of hardscape elements in stream design, provide habitat elements such as detention basins within hardscaped areas to support native wildlife species, and/or research and implement stream stabilization opportunities that meet the fundamental goals of providing bank stabilization while maintaining fundamental stream functions.	Significant and unavoidable for Projects R.8-2, R.9-2 and R.9-3. Even with implementation of Mitigation Measures

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
3.5.3. (cont.)	It is anticipated that impacted stream functions and values will be permanently lost at Projects R.8-2, R.9-2 and R.9-3, and would be replaced through off-site compensation or mitigation at other sites within the SMMP area. The direct impacts of these hardscape bank protection projects would remain significant and unavoidable. Additional mitigation for habitat losses would be provided as described in Mitigation Measures 3.5.1a and 3.5.1b.	3.5-3a and 3.5-3b, the potential impact would remain significant and unavoidable due to the habitat loss. Therefore, this impact is considered significant and unavoidable at the MEIR level.
3.5.4. Breeding Raptors and Birds: Construction of proposed facilities could result in disturbance to breeding raptors and passerine birds protected under the migratory bird treaty act and other statutes. Less than Significant with Mitigation.	3.5.4a: Zone 7 shall Identify and protect active songbird and raptor nests during construction with appropriate buffers and avoidance. Potential construction disturbance impacts will be reviewed at the project-level for specific facilities proposed under the SMMP and additional mitigation measures shall be implemented as appropriate. At a minimum, the following measure will be implemented to address potential impacts to nesting songbirds and raptors in the vicinity of the construction sites. To the extent feasible, construction activities in or near active stream channels shall avoid the songbird and raptor nesting season between March 15 and August 15. If construction must occur during this period, sites shall be surveyed by a qualified biologist to verify the presence or absence of nesting birds or raptors. If the survey indicates the potential presence of nesting birds or raptors, survey results would be coordinated with CDFG and suitable avoidance measures would be developed and implemented. Construction shall observe the generally recommended CDFG avoidance guidelines, which are maintaining a minimum of 500-foot buffer zone surrounding active raptor nests and a 250-foot buffer zone surrounding nests of other birds. Unless direction from CDFG specifies otherwise, buffer zones shall remain until young birds have fledged.	Less than Significant
3.5.5. Special-status Species Or Critical Habitat: Construction of proposed facilities could result in direct immediate impacts to special-status plant and/or wildlife species, or designated or proposed critical habitat for listed species. Significant and Unavoidable.	3.5.5a: Zone 7 shall protect special-status plant and wildlife species by minimizing habitat impacts during project design, consulting with resource agencies, and implementing protective measures. At the time of project certification, Zone 7 shall agree to comply with mitigation measures to protect special-status plant and wildlife species. Zone 7 will be required to implement measures that avoid, minimize, and compensate for significant impacts to special-status species and their habitat. Typical measures that may be included in the review of SMMP projects include: In support of the CEQA, RWQCB, CDFG and USFWS permitting processes for individual SMMP projects, biological and wetland surveys shall be conducted as part of the environmental review process to determine the presence and extent of sensitive habitats and/or species in vicinity of each project. Surveys shall follow established methods and shall be undertaken at times when the subject species is/are most likely to be identified. In cases where impacts to state- or federal-listed plant or wildlife species are imminent,	Significant and unavoidable at the MEIR level. Implementation of the above mitigation measure may or may not eliminate or reduce the impacts of individual projects to a less-than-significant level. It is anticipated that the SMMP projects that would reroute streams and create low-flow channels that reduce pooling within streams, and

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
3.5.5. (cont.)	formal protocol-level surveys may be required on a species-by-species basis to determine the local distribution of these species. Consultation with the USFWS and/or CDFG shall be conducted at an informal level for the SMMP projects that could impact federal or State candidate, threatened, or endangered species, or designated critical habitat for these species to determine the need for further consultation or permitting actions. • Project designs shall be reconfigured, whenever possible, to avoid impacts to sensitive wetland or biological resources and minimize disturbances to wetland and riparian corridors. Projects shall minimize ground disturbances and construction footprints near areas with special-status species to the extent practicable. • To the extent practicable, project activities located within or upstream from active amphibian breeding habitat shall be completed during the period that best avoids disturbance to plant and wildlife species present (e.g., May 15 to October 15). • Individual projects shall minimize the use of in-water construction methods in areas that support sensitive fish, amphibians, or aquatic reptiles, especially when they are known to be present. • In the event that equipment needs to operate in any watercourse with flowing or standing water, a qualified biological resource monitor shall be present at all times to alert construction crews to the possible presence of California red-legged frog, western pond turtle, salmonids (provided that access is available), or other aquatic species at risk during construction operations. • A qualified biologist shall locate sensitive resources and Zone 7's contractors shall fence off before construction activities begin and, where required, shall inspect areas to ensure that barrier fencing, stakes, and setback buffers are maintained during construction. • For work sites located adjacent to special-status plant or wildlife populations, a biological resource education program shall be provided for construction crews and contractors (primarily crew and construction foremen) as required before construction activities begin. • Biological monitoring shall be conducted particularly in areas near identified habitat for federal- and state-listed species. A "no take" approach shall be taken as feasible during construction near special-status plant and wildlife species habitats.	the large amount of stream channel that will be affected will cause a substantial short-term reduction in the quality and availability of habitat for special-status wildlife species, particularly amphibians and aquatic reptiles. Therefore, this impact is considered significant and unavoidable at the MEIR level.

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
3.5.6. Habitat Fragmentation: Sediment removal and vegetation management activities could fragment wildlife habitat and corridors resulting in long-term impacts to common and special-status plant and wildlife species. Less than Significant with Mitigation.	3.5.6a: Whenever feasible, Zone 7 shall incorporate design elements into individual Category 2^c projects, as determined during the individual project screening phase, to emphasize the retention of basic wildlife habitat elements within active project areas and retain habitat continuity during construction. Examples of several effective methods to reduce the effects of habitat fragmentation include: 1. Incorporating wildlife habitat elements into project designs to encourage native wildlife species to immediately use completed and restored project areas. Such design elements may include the use of downed trees or willow wattles for bank stabilization and cover, avoiding small patches of high quality wildlife habitat during construction, and the incorporation of aquatic cover (i.e., deep-water pools). 2. Temporal phasing of large-scale grading, habitat removal, or low-flow channel creation projects so that lengthy or greatly impacting projects do not create impassible obstacles to wildlife movement. As an example, the creation of low-flow channels and bank stabilization for Project R.8-3 are components of the same project, but could possibly be carried out in separate years to retain basic minimal wildlife habitat elements within the stream corridor at all times. Similarly, stream modifications for Project R.8-4 could be conducted after the project area for Project R.8-3 has been restored to minimize cumulative effects of these projects. 3. Spatial phasing of projects to assist in retaining wildlife habitat benefits. Using Project R.8-3 again as an example, elements within a project can be phased in to minimize the presence of large gaps in vegetation or aquatic habitat. Such a design could incorporate channel improvements on alternating 1,000-foot sections of creek, or phase improvements so that a single bank is graded and restored before the second bank is graded. This would also reduce cumulative impacts among nearby projects. 4. Revegetating and restoring impacted stream reaches as quickly as possible following disturbance using native plant species and long-term habitat management programs to ensure the return of habitat functions and values. To the extent that simple phasing can be applied both spatially and temporally to project design, the above mitigation measure would substantially reduce the potential of projects to fragment wildlife habitat and create barriers to wildlife movement. For stream reaches and associated upland areas that provide minimal plant and wildlife habitat values, habitat enhancement activities following project implementation may improve habitat contiguity for wildlife and provide a long-term improvement to wildlife movement corridors.	Less than Significant. Effects may be beneficial for Projects R.1-6 and R.1-7 and R.3-2 following SMMP implementation, as habitat improvements are expected to enhance the existing habitat connectivity.

^c Category 2: High Potential for Fragmentation Impacts.

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
3.5.7. Invasive Species: Long-term facility operation activities may facilitate the introduction and establishment of invasive wildlife species, primarily bullfrogs, following project implementation. Less than Significant with Mitigation.	3.5.7a: When appropriate, Zone 7 shall incorporate design elements into the SMMP projects that discourage the establishment of non-native wildlife species in sensitive areas. A primary element for bullfrog control based on guidance provided in the USFWS <i>Recovery Plan for the California Red-legged Frog</i> (USFWS, 2002) is the capacity to seasonally drain in-stream sediment detention basins to discourage bullfrog breeding. Other examples include waste management programs along created public trails, discouraging the public from feeding raccoons and feral pets, and animal removal if predator populations appear to be significantly detrimental to the native species breeding success and survival. Such design elements may curb bullfrog expansion into areas with populations of California red-legged frog include Arroyo Seco (Projects R.2-1 and R.2-3) and upper realigned Arroyo las Positas (Project R.2-2). Altamont Creek and Arroyo las Positas near the Springtown Natural Community Reserve (Projects R.1-1 though R.1-7) are other high priority natural areas where design elements should work to reduce habitat for non-native wildlife species. 3.5.7b: For select projects that could substantially expand bullfrog populations near sensitive California red-legged frog populations, Zone 7 shall implement a non-native predator control program in coordination with state and federal agencies. Arroyo del Valle is specifically identified in the 2002 Recovery Plan (USFWS, 2002) as a site that requires control or elimination of non-native predators. For Projects R.2-1 through R.2-3 and Projects R.1-1 though R.1-7, if after Mitigation Measure 3.5-7a has been applied the project is still expected to create a substantial bullfrog population source, then a specific program shall be created in coordination with the USFWS and CDFG to address and reduce bullfrog populations. Such a program shall include periodic amphibian surveys and removal of bullfrogs, and may require state and/or federal approval prior to implementation.	Less than Significant
3.5.8. Resource Protection or Habitat Conservation Plans: Implementation of the SMMP may impact adopted resource protection or habitat conservation plans. No Impact.	No Mitigation Measures Required.	

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Fisheries Resources		
3.6.1. Special-status Fish Species: Construction and maintenance activities associated with most proposed SMMP projects could result in impacts to special-status fish species and their habitat. Less than Significant with Mitigation.	3.6.1a: Implementation of Mitigation Measures 3.2.1a and 3.2.1b (see Section 3.2, Hydrology and Water Quality, implementation of a SWPPP and erosion control measures), as well as Best Management Practices (BMPs) for construction activities, would reduce potential impacts to special-status fisheries species and habitat resulting from sedimentation, turbidity, and hazardous materials. Due to the potential downstream extent of sediment, turbidity, and hazardous materials-related impacts, this mitigation measure will be implemented regardless of the status and distribution of special-status fisheries resources within the SMMP project area at the time of individual project construction. Specific measures aimed at protecting fisheries resources include: • All instream construction activities will be conducted during the low-flow period of April 15 through October 15. If feasible, all instream work will be conducted during times when channels are dry. • If construction in dry channels is not possible, water from around the section of the work site that is within the actively flowing channels will be diverted. This will reduce the potential for sediment or other pollutants to enter the waterways and to impact downstream resources. The diversions will consist of cofferdams installed in a manner that would not block more than two-thirds of the total stream width at any given time to allow for continued fish passage during construction. • Sediment curtains will be placed downstream of the construction or maintenance zone to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone. • Silt fencing will be installed in all areas where construction occurs within 100 feet of known or potential steelhead habitat. • Spoil sites (concrete wash areas) will be located so they do not drain directly into the waterways. If a spoil site drains into a water body, catch basins will be constructed to intercept sediment before it reaches the channels. Spoil sites will be graded to reduce the potential for erosion. • A spill prevention plan for potentially hazardous materials will be prepared and implemented. The plan will include the proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting of any spills. If necessary, containment berms will be constructed to prevent spilled materials from reaching the creek channels. • Equipment and materials will be stored as far from waterways as feasible. No debris such as trash and spoils will be deposited within wetlands. Staging and storage areas for equipment, materials, fuels, lubricants and solvents will be located outside of the stream channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream will be positioned over drip pans. Any equipment or vehicles driven and/or operated within or adjacent to the	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Fisheries Resources (cont.)		
3.6.1. (cont.)	stream will be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life. Vehicles will be moved away from the stream prior to refueling and lubrication. • Proper and timely maintenance for vehicles and equipment will be provided to reduce the potential for mechanical breakdowns leading to a spill of materials into or around the creeks. Maintenance and fueling will be conducted in an area that meets the criteria set forth in the spill prevention plan (i.e., away from the creeks). • Herbicides used for instream vegetation management will be limited to formulations approved for aquatic use and will be applied by certified workers in accordance with the manufacturer's specifications. • Fresh concrete will be isolated from wetted channels for a period of 30 days after it is poured. If a 30-day curing period is not feasible, a concrete sealant approved for use in fisheries habitat may be applied to the surfaces of the concrete structure. If a sealant is used, the manufacturer's guidelines for drying times will be followed before reestablishing surface flows within the work area. • To the extent feasible (i.e., in cases where a change in channel configuration is not the goal or objective of the project), project sites will be restored to pre-construction channel conditions, including streambed composition, compaction, gradient, and low flow channels. Large woody debris will be retained or restored where possible. Channel banks will be returned to original grade slope and appropriate bank stabilization techniques will be implemented to reduce the potential for erosion and sedimentation. A plan and/or specification describing pre-project conditions and restoration methods will be prepared prior to construction. • Project sites shall be revegetated with an appropriate assemblage of native upland vegetation, and if necessary, riparian and wetland vegetation, suitable for the area. A plan and/or specification describing pre-project conditions, restoration and monitoring success criteria will be prepared prior to construction. 3.6.1b: This mitigation measure will be implemented for projects involving instream construction activities in areas known to support CCC steelhead and/or Pacific lampreys at the time of project planning and design. If special-status fish species are known or suspected of occurring within the SMMP project area prior to the onset of construction or maintenance activities for individual projects, the following additional measures will be implemented to reduce the likelihood of direct injury or mortality to CCC steelhead and Pacific lamprey: • All instream activities will be restricted to low-flow periods of June 15 through October 15. If the channel is dry, work can occur as early as June 1. Restricting activities to this work window will minimize impacts to migrating adult and smolt steelhead.	

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Fisheries Resources (cont.)		
3.6.1. (cont.)	• Prior to construction of a diversion (coffer dams) and placement of sediment curtains (see Mitigation Measure 3.6.1a), a qualified biologist will conduct fish relocation activities, and immediately release captured fish to a suitable habitat near the project site. Capture and relocation measures will be conducted in accordance with the Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act (NMFS, June 2000b). • If groundwater is encountered, or if water remains within the work site after flows are diverted, it will be pumped out of the construction area and into a retention basin constructed of hay bales lined with filter fabric. The pump(s) will be screened according to NMFS fish screening criteria for anadromous salmonids (NMFS, 1997b) in case individual fish eluded prior capture and relocation efforts. • A qualified biological monitor will be on site during all instream construction and maintenance activities. The biological monitor will be authorized to halt the activities if impacts to special-status fisheries species are evident.	
3.6.2. Steelhead Migration And Non-native Predator Species: The construction of instream structures such as sediment basins, culverts, bridges, and on-channel wetlands may result in barriers to steelhead migration and increases in the abundance and distribution of non-native predator species. Less than Significant with Mitigation.	3.6.2a: All proposed instream structures within ADLL, Arroyo del Valle, and Arroyo Mocho will be designed and constructed in manner that will not impede fish passage. Weirs, culverts, bridges, and grade control structures will be designed according to guidelines presented in the <i>California Salmonid Stream Habitat Restoration Manual</i> (Flosi et al., 1998), including the recently added section entitled <i>Fish Passage Evaluation at Stream Crossings</i> (CDFG, 2003). Implementation of this mitigation measure would reduce potential impacts to steelhead passage to less than significant. 3.6.2b: Implementation of Mitigation Measures 3.5.5a and 3.5.5b (see Section 3.5, Biological Resources) at projects R.3-2 and R.3-4 would reduce potential non-native predator impacts to special-status fisheries species to less than significant.	Less than Significant
3.6.3. Special-status Fish Species: Operation of the Arroyo Mocho Bypass and Regional Storage at Chain of Lakes project (R.6-2) and the Arroyo las Positas Diversion project (R.5-3) could result in direct impacts to special-status fish species. Less than Significant with Mitigation.	3.6.3a: During the final design and project-level environmental review phase for projects R.5-3 and R.6-2, Zone 7 shall investigate potential methods for screening the diversion structures to exclude fish from the proposed artificial channels and the detention/recharge lakes. Potentially feasible screening alternatives include traditional straight-faced screens, if it is determined that the sweeping velocities past the screens are sufficiently high to prevent fish impingement and debris build-up, or rotating drum screens. If screening the diversions is deemed feasible, the length of the weir may also be reduced. Alternatively, steelhead could be prevented from inadvertently entering the Chain of Lakes via the Arroyo las Positas diversion (R.5-3) through the construction of a positive fish barrier downstream of the diversion. This could be achieved through constructing a drop structure. The maximum known jumping height of average-sized adult steelhead is approximately 11 feet if the appropriate hydraulic conditions exist (Bjornn and Reiser, 1991). One of these essential conditions is presence of a plunge pool with a water depth of at least 125 percent	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Fisheries Resources (cont.)		
3.6.3. (cont.)	of the vertical jumping distance (i.e., the distance from the water level in the pool to the crest of the structure). Thus, the vertical height of a drop structure that would be necessary to constitute a barrier depends largely on the water depth and hydraulic conditions below the structure. As discussed above, Arroyo las Positas does not offer suitable steelhead habitat and blocking steelhead access to this drainage would not be considered an adverse impact to the species. Furthermore, the outlet of the drainback channel shall also be designed as a positive fish barrier to prevent steelhead from entering the Chain of Lakes. The design of the fish screens and drop structure shall be coordinated with technical staff at NMFS.	
3.6.4. Hydrology-Related Impacts to Special-status Species: Operation of the Sycamore Grove Recharge Bypass project on the South Tributary of Arroyo del Valle (R.4-1) could result in water quality and hydrology-related impacts to special-status fish species. Less than Significant with Mitigation.	3.6.4a: Given the uncertainties about the overall effects of the proposed releases on fisheries resources, Zone 7 shall develop and implement aquatic habitat assessment studies of Arroyo del Valle immediately below the reservoir and of South Tributary. The assessment will quantify steelhead habitat potentially lost in Arroyo del Valle due to proposed reductions in releases, and habitat potentially gained in South Tributary due to SBA releases. The assessment will include an evaluation of the feasibility of removing or remediating the existing migration barrier on South Tributary upstream of Highway 84 and make recommendations on potential habitat improvement measures. • If the assessment concludes that the proposed project will result in no net loss (or a net gain) in potential steelhead habitat, recommendations made in the habitat assessment report (including barrier removal if feasible) will be implemented. • If the assessment concludes that the proposed project will result in a net loss of potential steelhead habitat, Zone 7 will negotiate suitable habitat replacement options with NMFS and CDFG.	Less than Significant
3.6.5. Fish Resources: Implementation of habitat protection and enhancement projects, including fish barrier removal projects, would have beneficial impacts on the fisheries resources of the SMMP project area. Beneficial.	Implement Mitigation Measure 3.6.5a.	Beneficial

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Air Quality		
3.7.1. Criteria Air Pollutants Emissions: Construction and demolition activities associated with project construction would generate short-term emissions of criteria air pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions. Less than Significant with Mitigation.	3.7.1a: At a minimum, contractor(s) shall include the following BAAQMD Basic Control Measures as applicable: • Water all active project construction sites at least twice daily, and more often on days when winds exceed 10 to 15 mph. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard. • Pave, apply water three times daily, or apply non-toxic chemical soil stabilizers on all unpaved access roads, parking areas, and staging areas at project construction sites. • Sweep daily with water sweepers all paved access roads, parking areas, and staging areas at project construction sites. • Sweep streets daily with water sweepers if visible soil material is carried onto adjacent public streets. 3.7.1b: For projects with construction areas greater than 4 acres in size, contractor(s) shall include the following additional measures as applicable: • Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more). • Enclose, cover, water twice daily or apply (non-toxic) chemical soil stabilizers to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 mph. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways. • Replant vegetation in disturbed areas as quickly as possible. 3.7.1c: For projects located adjacent to sensitive receptors, contractor(s) shall include the following measures as applicable: • Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving a project construction site. • Install wind breaks or plant trees/vegetative wind breaks at windward side(s) of construction areas. • When winds (instantaneous gusts) exceed 25 mph, water more frequently. • Limit the area subject to excavation, grading, and other construction activity at any one time. • Designate a person or persons to monitor the dust control program and order increased watering, as necessary, to prevent transport of dust offsite. The name and telephone number of such persons shall be provided to the BAAQMD prior to the start of construction.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Air Quality (cont.)		
3.7.2. Pumps and Other Electrical Components: Emissions associated with long-term operation of SMMP components would be limited to electrical demands associated with pumps, testing and potential use of emergency generators, and from increased employee trips. Emissions from these sources would not be substantial and would not exceed significance criteria of the BAAQMD. Less than Significant.	No Mitigation Measures Required.	
3.7.3. Odor: Project operation could result in operational odor emissions. Less than Significant.	No Mitigation Measures Required.	
Noise		
3.8.1. Increased Noise Levels: Construction activities would intermittently and temporarily generate noise levels above existing ambient levels in the vicinity of individual SMMP project sites. Less than Significant with Mitigation.	3.8.1a: To comply with the noise standards and other provisional requirements, review potential construction noise impacts at the project-level for specific facilities or management plans proposed under the SMMP and implement additional mitigation measures, if appropriate, including but not limited to: • Construction hours shall be limited to from 8:00 a.m. and 5:00 p.m. on weekdays. • Impact tools used for project construction shall be hydraulically or electrically powered wherever possible. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed-air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to 10 dBA. External jackets on the tools themselves shall be used where feasible, which could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever feasible. • Noise control measures shall be applied to construction equipment. Equipment and trucks used for project construction shall utilize normal noise control techniques (e.g., mufflers in good working order). • A compliance-monitoring program shall be implemented in order to stay within the parameters of project-specific compliance documents. The compliance-monitoring program shall oversee these mitigation measures and would include reporting protocols. The compliance-monitoring program may entail posting signs at project construction sites that include permitted construction days and hours, and a day and evening contact number for the project construction site. • Construction activities shall be planned so that additive noise is minimized (e.g., avoid concurrent use of loud construction equipment) in order to reduce the duration in which a sensitive receptor is affected by noise.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Noise (cont.)		
3.8.1. (cont.)	- The proximity of construction noise to sensitive receptors shall be limited. Stationary noise sources, such as diesel generators, shall be located as far from sensitive receptors as possible. Haul-trucks and other construction equipment shall be restricted to routes that practicably avoid sensitive receptors. - Appropriate measures shall be taken to control pedestrian access to active construction areas. Recreational users should be kept at a safe distance from the operation of construction equipment.	
3.8.2. Increased Noise Levels: Operational activities of certain SMMP projects would have the potential to generate noise levels above existing ambient levels in the project vicinity. Less than Significant with Mitigation.	3.8.1b: Construction contractors shall locate fixed construction equipment such as compressors as far as possible from noise-sensitive receptors during construction. 3.8.2a: The effects of noise resulting from the use or operation of new facilities shall be analyzed to ensure consistency with relevant local noise ordinances. The design of new facilities shall incorporate specifications that prevent significant noise impacts on nearby residences. - Operation of maintenance equipment shall abide by the local noise ordinances. - Speed limits shall be placed on roads managed under the SMMP to reduce noise levels caused by motor vehicle traffic.	Less than Significant
Traffic and Circulation		
3.9.1. Short-term Traffic: Implementation of individual SMMP projects would generate short-term constructed-related traffic. Truck trips and worker trips would increase short-term traffic delays for vehicles traveling past the construction zone on roadways serving project components. Less than Significant with Mitigation.	3.9.1a: Zone 7 shall arrange for a detailed traffic control plan as required for individual SMMP projects to be prepared by a licensed traffic engineer. The traffic control plan shall comply with requirements of the jurisdictional agency directly affected by the project construction. The traffic control plan would include, but would not be limited to, the following elements: - Zone 7 or its contractors shall restrict construction to non peak periods as required for specific work sites. - Zone 7 or its contractors shall coordinate construction activities (time of year and duration) to minimize traffic disturbances adjacent to schools and commercial areas. - Zone 7 or its contractors shall post advanced warning of construction activities. - Zone 7 or its contractors shall provide temporary signage indicating that businesses are open. 3.9.1b: Zone 7 shall require off-street parking for construction workers' vehicles, or, if that is impractical, workers could be shuttled to the work site from an off-site location.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Traffic and Circulation (cont.)		
3.9.2. Transit Service Disruption: Construction activities associated with the implementation of individual SMMP projects could disrupt transit service. Less than Significant with Mitigation.	3.9.2a: This measure applies to construction activities that would displace bus stops. As part of the traffic control plan for roadway segments and intersections (see Mitigation Measure 3.9.1a), Zone 7 shall incorporate a plan, as needed, for the temporary relocation of bus stops. This plan would be completed in coordination with LAVTA or BART Express.	Less than Significant
3.9.3. Adjacent Land Use Access: Construction could affect access to adjacent land uses, emergency facilities and streets used for general and emergency access, potentially causing safety hazards. Less than Significant with Mitigation.	3.9.3a: As part of the traffic control plan for roadway segments and intersections (see Mitigation Measure 3.9.1a), Zone 7 shall develop comprehensive strategies for maintaining emergency access. Also, police, fire, and emergency service providers shall be notified of the timing, location, and duration of construction activities during the project implementation. 3.9.3b: Zone 7 shall not restrict access to emergency facilities. Zone 7 shall coordinate with fire station personnel to maintain required 24-hour access to fire stations within the project vicinity. To avoid blocking access to emergency medical facilities, Zone 7 and its contractors shall schedule work on project sites such that multiple access points to the medical center are not blocked simultaneously. 3.9.3c: Zone 7 shall provide, upon request, a copy of the traffic control plan to the sheriff's department, local police departments, county fire department, and local fire departments for their review prior to construction. 3.9.3d: Zone 7 shall temporarily detour bicycle paths around the construction zone or to other streets to ensure that no new safety hazards result from implementation of the project. 3.9.3e: Zone 7 shall require a minimum of 72-hour advance notice of access restrictions to the residents and businesses. Affected residents and businesses would be advised when to move motor vehicles out of the area to be closed. Notification and other requirements stipulated in the encroachment permit shall be incorporated into the traffic control plan.	Less than Significant
3.9.4. Wear-and-Tear On Haul Routes: Construction of individual SMMP projects could increase wear-and-tear on the designated haul routes used by construction vehicles to access the project sites. Less than Significant with Mitigation.	3.9.4a: If required by the encroachment permit, Zone 7 shall prepare a videotape of road conditions for the routes to be used by project-related vehicles. Zone 7 shall prepare a similar videotape of road conditions after project construction is completed. The pre- and post-construction conditions of the haul routes shall be reviewed by staff of the local Public Works Department. Zone 7 shall enter into an agreement prior to construction that provides details on the pre-construction conditions and post-construction requirements of the rehabilitation program.	Less than Significant
3.9.5. Long-term Traffic: Long-term operational trips associated with the SMMP would be limited to those needed to perform inspection and maintenance activities. It is anticipated that these activities would likely generate fewer trips than project construction. Traffic on area roadways serving the project locations would increase negligibly as a result of long-term maintenance. Less than Significant with Mitigation.	Implement Mitigation Measure 3.9.1a.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Hazardous Materials		
3.10.1. Exposure To Hazardous Materials: Project construction activities would involve use of chemicals such as fuels and other hazardous materials. Such activities result of an accidental spill such materials and could expose workers and/or the public to hazardous materials. Less than Significant with Mitigation.	3.10.1a: The following hazardous materials management, spill prevention, and spill response/cleanup shall be included in contractor specifications for each project site: • Prepare a construction site plan, including delineation of hazardous material and hazardous waste storage areas, access and egress routes, drainage paths, emergency assembly areas, and temporary hazardous waste storage areas. • Provide Materials Safety Data Sheets for all chemicals used and stored at the project site. • Implement spill control and countermeasures, including employee spill prevention/response training. • Prepare an inventory list of emergency equipment. • Provide off-loading, safety, and handling procedures for each chemical. • Provide notification and documentation procedures.	Less than Significant
3.10.2. Contaminated Soil and Groundwater: Construction of in-stream and out-of-stream projects could disturb contaminated soils or groundwater. This could increase the potential of exposure of public and the environment to hazardous materials. Less than Significant with Mitigation.	3.10.2a: Unanticipated contaminated soils may be discovered during construction or well drilling. The following procedures shall be included in contractor specifications, in the event that noxious odors, discolored soil, or other indications of gross contamination are identified: • Stop work in areas of contact. • If necessary, call responsible agencies. Typically, the Alameda County Health Care Services Agency and/or the Department of Environmental Health would be the responsible agencies. The San Francisco Bay RWQCB could become involved if the groundwater or surface water is contaminated, and the California Department of Toxic Substances Control could become involved if soils are contaminated. • Fence off areas of contamination. • Perform appropriate clean up procedures, i.e., any contaminated soils would be segregated, profiled, and appropriately disposed of at an offsite location. The disposal method would depend on the types and concentrations of contaminants identified in the soil. Any site investigations or remediations would be performed in accordance with applicable laws.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Public Services and Utilities		
3.11.1. Utility Service Disruption: Construction of individual SMMP projects could result in temporary, planned, or accidental disruption of utility services. Less than Significant with Mitigation.	3.11.1a: For SMMP projects located within urban/suburban areas, the following mitigation measures are identified: - Utility excavation or encroachment permits shall be required from the appropriate agencies. These permits include measures to minimize utility disruption. Zone 7 and its contractors shall comply with permit conditions and such conditions shall be included in construction contract specifications. - Utility locations shall be verified through field surveys (potholing) and use of the Underground Service Alert services. - Detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services shall be notified of Zone 7's construction plans and schedule. Arrangements shall be made with these entities regarding protection, relocation, or temporary disconnection of services. - Zone 7 shall employ special construction techniques in areas where excavation activities would parallel wastewater mains. These special measures, which should be included in the engineering specifications, shall include trench wall-support measures to guard against trench wall failure and possible resulting loss of structural support for the water main. - Residents and businesses in the project area shall be notified of planned utility service disruption two to four days in advance, in conformance with county and state standards. 3.11.1b: Consistent with its current operational practices, Zone 7 shall coordinate construction activities and delivery outage schedules with Zone 7 contractors and other affected agencies, as appropriate.	Less than Significant
3.11.2. Police and Fire Protection Services: Construction activities for all facilities could require short-term police and fire protection services to assist in traffic management or in the event of an accident. Less than Significant with Mitigation.	3.11.2a: Zone 7 or its contractors shall provide, upon request, a copy of the Traffic Control Plan to the County sheriff's department, local police departments, County fire department, and local fire departments for their review prior to construction. Zone 7 shall provide 72-hour notice to the local service providers prior to construction of individual pipeline segments. Discussion on the Traffic Control Plan is provided in Section 3.9, Traffic and Circulation, under Mitigation Measure 3.9.1b.	Less than Significant
3.11.3. Police and Fire Protection Services: Implementation of individual SMMP projects could increase demands on to police or fire protection services. Less than Significant.	No Mitigation Measures Required.	

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Cultural Resources		
3.12.1: Archaeological Resources: Construction activities associated with the SMMP could cause substantial adverse effects to known or unknown significant archaeological resources. Less than Significant with Mitigation.	3.12.1a: Cultural Resources Inventory. Zone 7 shall follow the following steps, which are typically taken to assess and mitigate potential impacts to cultural resources for the purposes of CEQA: • Identify both previously recorded cultural resources and those not previously recorded. • Evaluate the significance of cultural resources using CEQA guidelines. • Identify the significance of impacts under CEQA of the proposed project within the project area. • Develop and implement mitigation measures designed to avoid, minimize, rectify, or reduce or eliminate the effects of the project on significant cultural resources. Minimally, a cultural resources inventory shall consist of a cultural resources records search to be conducted at the Northwest Information of the California Historical Resources Information System located at Sonoma State University; consultation with the Native American Heritage Commission (NAHC) and with interested Native Americans identified by the NAHC; a field survey (if one has not previously been conducted); recordation of all identified archaeological sites and historic buildings and structures on California Department of Parks and Recreation 523 Site Record forms; and preparation of a cultural resources inventory report describing the project setting, methods used in the investigation, results of the investigation, and recommendations for management of identified resources. Certain agencies, such as the Federal Highway Administration and California Department of Transportation (Caltrans), have specific requirements for inventory areas and documentation format. Identified cultural resources that may be impacted by the SMMP shall be evaluated for eligibility for listing on the CRHR. Cultural resources that are eligible for the CRHR are considered to be significant cultural resources. Cultural resources that are identified within the project area subject to federal approval, permits, or funding shall also be evaluated for eligibility for listing on the NRHP. Cultural resources determined to be eligible for listing on the NRHP are automatically eligible for listing on the CRHR and are considered to be significant cultural resources. 3.12.1b: Avoid Impacts on Cultural Resources. If feasible, impacts on identified cultural resources including prehistoric and historic archaeological sites, human remains, and historical buildings and structures shall be avoided. Methods of avoidance may include, but shall not be limited to, project re-design, project cancellation, or identification of protection measures such as capping or fencing. If avoidance is not feasible, the following Mitigation Measures 3.12.2, 3.12.3a, 3.12.3b, 3.12.3c, 3.12.4a, and/or 3.12.4b shall be implemented as necessary.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Cultural Resources (cont.)		
3.12.2. Archaeological Deposits: Project construction associated with the SMMP cause substantial effects to known, but unevaluated prehistoric and historic archaeological deposits from ground disturbing construction operations. Less than Significant with Mitigation.	3.12.2a: Archaeological testing and Data Recovery. In the event, that it is infeasible to avoid impacts on archaeological sites that have been determined to be eligible for listing on the CRHR or the NRHP (significant resources), additional research including, but not necessarily limited to, archaeological excavation shall be conducted (CCR Section 15126.4 (b)(3)(C)). This work shall be conducted by a qualified archaeologist and shall include preparation of a research design, additional archival and historical research, archaeological excavation, analysis of artifacts, features, and other attributes of the resource, and preparation of a technical report documenting the methods and results of the investigation in accordance with the California Office of Historic Preservation <i>Guidelines for Archaeological Research Design</i> (1991). The purpose of this work is to recover a sufficient quantity of data to compensate for damage to or destruction of the resource. The procedures to be employed in this data recovery program shall be determined in consultation with responsible agencies and interested parties, as appropriate. Where necessary, Zone 7 shall seek Native American input and consultation. 3.12.2b: Archaeological Monitoring. If ground-disturbing activities that have the potential to impact archaeological remains were to occur in an area that has been determined by a qualified archaeologist to be sensitive for the presence of buried archaeological remains, a qualified archaeologist shall be retained to monitor those activities. Archaeological monitoring shall be conducted in areas where there is a likelihood that archaeological remains may be discovered but where those remains are not visible on the surface. Monitoring shall not be considered a substitute for efforts to identify and evaluate cultural resources prior to the project initiation. Where necessary, Zone 7 shall seek Native American input and consultation. 3.12.2c: Stop Work in the Event of an Archaeological Discovery. If potentially significant cultural resources are discovered during ground-disturbing activities associated with project preparation, construction, or completion, work shall halt in that area until a qualified archaeologist can assess the significance of the find, and, if necessary, develop appropriate treatment measures in consultation with Alameda County and other appropriate agencies and interested parties. For example, a qualified archaeologist shall follow accepted professional standards in recording any find including submittal of the standard Department of Parks and Recreation (DPR) Primary Record forms (Form DPR 523) and location-related information to the California Historical Resources Information Center office (Northwestern Information Center). The consulting archaeologist shall also evaluate such resources for significance per the CRHR eligibility criteria (Public Resources Code Section 5024.1; Title 14 CCR Section 4852). If the archaeologist determines that the find does not meet the CEQA standards of significance, construction shall proceed. On the other hand, if the archaeologist determines that further information is needed to evaluate significance, Zone 7 shall be notified and a data recovery plan shall be prepared.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Cultural Resources (cont.)		
3.12.2. (cont.)	3.12.2d: Comply with State Laws Pertaining to the Discovery of Human Remains. If human remains of Native American origin are discovered during project construction, it is necessary to comply with state laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (Pub. Res. Code Sec. 5097). If any human remains are discovered or recognized in any location on the project site, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: • The Alameda County Coroner/Sheriff has been informed and has determined that no investigation of the cause of death is required; and • If the remains are of Native American origin, - The descendants of the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or - The Native American Heritage Commission was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the commission.	
3.12.3. Paleontologic Resources: Ground disturbing activities may adversely affect unidentified paleontologic resources at the site. Less than Significant with Mitigation.	3.12.3a: Stop work in the event of a paleontologic discovery. An appointed representative of Zone 7 shall notify a qualified paleontologist of unanticipated discoveries, document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in Section 15064.5 of the CEQA Guidelines. In the event of an unanticipated discovery of a fossil during construction, excavations within 50 feet of the find shall be temporarily halted or diverted until the discovery is examined by a qualified paleontologist as per the Society of Vertebrate Paleontology (SVP) standards (SVP 1995; 1996). The paleontologist shall notify Zone 7 to determine procedures that would be followed before construction is allowed to resume at the location of the find. If Zone 7 determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan to mitigate the effect of the project on the qualities that make the resource important, and such plan shall be implemented. The plan shall be submitted to Zone 7 for review and approval.	Less than Significant
3.12.4. Historic Architectural Resources: Construction of SMMP projects could adversely affect historic architectural resources through demolition or significant changes to the historical setting. Less than Significant with Mitigation.	3.12.4a: Follow standards for the Treatment of Historic Properties. Any alterations, including relocation, to historic buildings or structures shall conform to the Secretary of the Interior's Standards for the Treatment of Historic Properties and Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (1995).	

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Cultural Resources (cont.)		
3.12.4. (cont.)	3.12.4b: Record buildings or Structures to Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) standards. If avoidance or relocation of an historic resource is not feasible, a qualified architectural historian shall be retained to document the impacted historical architectural resource to HABS and HAER standards. HABS and HAER documentation packages shall be entered into the Library of Congress as well as the Northwest Information Center of the California Historical Resources Information System. The recordation of a building or structure to HABS/HAER standards will reduce impacts on significant historic buildings and structures, but would not reduce it to a less-than-significant level. Impacts on significant historic buildings under these circumstances would remain significant and unavoidable.	Less than Significant with Mitigation Measure 3.12.4a. Significant and Unavoidable at the MEIR level in case avoidance is not feasible.
Visual Resources		
3.13.1. Visual Aesthetics: Construction of the SMMP projects could substantially alter or diminish the visual aesthetics of the surrounding environment. Less than Significant with Mitigation.	3.13.1a: Revegetation Plan. Individual projects shall include development of a revegetation or restoration plan to facilitate re-establishment of native vegetation within affected stream channel locations. The restoration plan shall be focused on minimizing the temporary effects of in-channel disturbance, and shall be consistent with restoration activities for erosion control. New plants would include grasses, shrubs, and trees typical of the surrounding area. The contractor shall be required to warrant landscape plantings for one year after project completion. 3.13.1b: Restoration to Pre-Project Conditions. Zone 7 shall ensure that its contractors restore disturbed areas to their pre-project condition so that short-term construction disturbance does not result in long-term visual impacts (Also see Mitigation Measures 3.4.1b and 3.4.1c in Section 3.4, Land Use).	Less than Significant
3.13.2. Alter Visual Conditions: Implementation of individual SMMP projects could alter existing visual conditions, resulting in significant effects to short-range and long-range view. Less than Significant with Mitigation.	3.13.2a: Landscape Plan. Zone 7 shall use design elements to enhance visual integration of any above-ground components with their surroundings. 3.13.2b: Agency Coordination. Zone 7 shall coordinate with the affected jurisdiction regarding the design of facilities.	Less than Significant

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Cumulative Impacts		
5.1: Concurrent construction of development under the approved General Plans and municipal CIPs could result in cumulative short-term impacts associated with construction activities. These include short-term impacts to water quality, air quality, noise, traffic, hazardous materials, visual resources, and effects to surrounding land uses. In some areas, these impacts, while individually short term in nature, would be potentially significant due to their aggregate effect; however, construction-related impacts would not result in long-term alteration of the environment. Less than Significant.	No additional mitigation measures beyond those identified in Chapter 3.	Short-Term, Less than Significant
5.2: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to water resources, water quality, and flooding impacts associated with alteration of drainage patterns and increases in impervious surface areas. Less than Significant.	5.2.1a. Chain of Lakes Operations Plan. Development of Chain of Lakes projects R.5-3, R.6-1, and R.6-2 shall include the review of regional facility hydrographs and operations plans to account for cumulative flow conditions within the SMMP project area. The timing of Chain of Lakes releases shall be reviewed to ensure that they are coordinated with Del Valle Reservoir releases to avoid adverse effects to channel capacity downstream of the confluence of ADLL and Arroyo del Valle.	
5.3: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to sediment transport. Less than Significant.	No Mitigation Measures Required.	
5.4: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to wetland and vernal pool habitats, with secondary effects to special-status species, including burrowing owl, California red-legged frog, California tiger salamander, fairy shrimp, pond turtle, and nesting sensitive birds. Less than Significant with Mitigation.	Implement Mitigation Measures contained in Section 3.5, Biological Resources.	Significant and Unavoidable at the MEIR Level
5.5: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to habitat for central coast steelhead. Less than Significant with Mitigation.	Implement Mitigation Measures contained in Section 3.6, Fisheries.	Beneficial at the MEIR Level

TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Significance After Mitigation
Cumulative Impacts (cont.)		
5.6: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term geologic impacts. Less than Significant with Mitigation.	Implement Mitigation Measures established in Section 3.3, Geology and Soils.	Less than Significant
5.7: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to land use. Less than Significant with Mitigation.	Implement Mitigation Measures in Section 3.4, Land Use.	Less than Significant
5.8: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to cultural resources. Less than Significant with Mitigation.	Implement Mitigation Measures contained in Section 3.12, Cultural Resources.	Significant and Unavoidable at the MEIR Level – Potentially Mitigable at the Project Level
5.9: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to visual resources. Less than Significant with Mitigation.	No Mitigation Measures Required.	

CHAPTER 1

Introduction

1.1 Purpose of the EIR

The Zone 7 Water Agency (Zone 7) has prepared this Draft Master Environmental Impact Report (Draft MEIR) to provide the public, and Responsible and Trustee Agencies reviewing this project, with information about the potential effects, both beneficial and adverse, on the local and regional environment associated with Zone 7's Stream Management Master Plan (SMMP). This Draft MEIR was prepared in compliance with the California Environmental Quality Act (CEQA) of 1970 (as amended), the State EIR guidelines, and California Administrative Code, Title 14, Division, Chapter 3.

As stated in the CEQA guidelines sections 15175-15179 a Master EIR differs from a project level EIR in the following ways: a Master EIR functions similarly to a program EIR for a multi-phased project such as a specific plan. A Master EIR forms the basis for analyzing the effects of subsequent projects (CEQA Guidelines §15175, et. seq.). Later projects which are consistent with the specific plan and which fall "within the scope" of the plan's Master EIR require no further negative declaration or EIR. A master EIR may be re-certified for a subsequent project which is related to and substantially consistent with the specific plan (CEQA Guidelines §15178). Other projects which differ materially or result in potential impacts not previously analyzed, may be covered by a "focused EIR" that details the new project-specific impacts while incorporating the previous analysis of cumulative and growth inducing impacts by reference (CEQA Guidelines §15179.5).

The Draft MEIR describes the environmental impacts of the SMMP. Mitigation measures are identified for reducing impacts to a less-than-significant level. The impact analyses in this report are based on a variety of sources including agency consultation, General Plans for Alameda County and the Cities of Livermore, Pleasanton, Dublin, and field surveys completed by Environmental Science Associates staff.

1.2 CEQA EIR Process

Notice of Preparation

In accordance with Section 15082 of CEQA Guidelines, Zone 7, as Lead Agency, prepared a Notice of Preparation (NOP) of an EIR (see **Appendix A**). The NOP was circulated from May through June 2004 to local, state, and federal agencies, and to other interested parties. No Initial

Study was prepared since Zone 7 decided in advance that a full MEIR would be required for the SMMP. As indicated in the NOP, the Draft MEIR includes project specific analysis examining the types of impacts specific to implementation of the SMMP, including impacts from construction and operation of stream management facilities, secondary effects of growth, and cumulative impacts. The NOP provided a description of the proposed action and a preliminary list of potential environmental impacts. Written comments received during scoping are included in **Appendix A**.

Public and Agency Scoping

An interagency meeting held on May 27, 2004 at the Zone 7 Administrative Office presented the project, received agency input on project development, and received comments on the content of the EIR / scope of analysis. A similar scoping meeting for both agencies and interested public was held at the same location on the same day; May 27, 2004. Public notices were placed in local newspapers informing the general public of the scoping meeting. Additional coordination with public agencies was provided through informal consultation conducted throughout the DEIR process. A number of organizations and citizens commented on the NOP (written comments provided in **Appendix A**). Issues and concerns raised during the scoping period include:

- The presence of sensitive species;
- Impacts to water quality and water supply;
- Accuracy and modification of the 100-year flood plain;
- Improvements to the affected creeks and streams;
- Traffic impacts;
- Compliance with necessary regulatory agencies.

Draft MEIR

This document constitutes the Draft MEIR. It contains a description of the SMMP, description of the environmental setting, identification of SMMP impacts, and mitigation measures for impacts found to be significant as well as an analysis of plan alternatives. The Draft MEIR addresses those environmental issues that could result in potentially significant environmental effects from plan implementation.

Significance criteria have been developed for each environmental issue analyzed in this Draft MEIR, and are defined at the beginning of each impact analysis section. Impacts are categorized as follows:

- 1) significant and unavoidable
- 2) potentially significant, but can be mitigated to a less-than-significant level
- 3) less than significant (mitigation is not required under CEQA, but may be recommended)
- 4) no impact
- 5) beneficial

CEQA requires that a lead agency shall neither approve nor carry out a project as proposed unless the significant environmental effects have been reduced to an acceptable level, where possible (CEQA §15091 and §15092). An acceptable level is defined as eliminating, avoiding, or

substantially lessening the significant effects. If such a reduction is not possible, a lead agency must adopt Findings and a Statement of Overriding Considerations. As defined in CEQA §15093, an agency may proceed with a project which has significant adverse environmental impacts if it makes one or more written findings for each significant effect, accompanied by a brief explanation of the rationale for each finding.

Public Review

This document is being circulated to local, state and federal agencies, and to interested organizations and individuals who may wish to review and comment on the report. Publication of this Draft MEIR marks the beginning of a 45-day public review period, during which written comments may be directed to the following address: Joe Seto, Zone 7 Water Agency 100 North Canyons Parkway Livermore, CA 94550. During the 45-day review period, Zone 7 will hold a formal public hearing on the Draft MEIR. After the Final MEIR containing the responses to comments received on the Draft MEIR has been published; Zone 7 will hold a public hearing on the Final MEIR to consider EIR certification.

Final MEIR Publication

Written and oral comments received in response to the Draft MEIR will be addressed in a Response to Comments addendum document that when combined together with the Draft MEIR, will constitute the Final MEIR. The Final MEIR will be released for public review. The Zone 7 Board of Directors will then consider EIR certification. Upon EIR certification, Zone 7 may proceed to take action on project approval.

If Zone 7 approves the SMMP even though significant impacts identified by the EIR cannot be mitigated, the agency must state in writing the reasons for its actions. A Statement of Overriding Considerations must be included in the record of the project approval and mentioned in the Notice of Determination (CEQA Guidelines §15093.c).

Mitigation Monitoring and Reporting

Section 15097 of the CEQA Guidelines specify that where a public agency has made the findings to certify an EIR in conjunction with approving a project, “the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it imposed to mitigate or avoid significant environmental effects” to ensure that the mitigation measures and project revisions identified in the EIR are implemented. Throughout the Draft MEIR, mitigation measures have been clearly identified and presented to ensure avoidance or reduction of potentially significant impacts to less than significant levels. The measures have been written in a concise language that will facilitate establishment of a monitoring program, in the event that the project has been deemed viable and the Board of Directors certifies the EIR approves the project. Any measures adopted by Zone 7 as conditions for approval of the project will be included in a Mitigation Monitoring and Reporting Program to ensure compliance.

1.3 Documents Incorporated by Reference

One document and four technical memorandums are referred to and incorporated in part by reference in this ADEIR. As provided for by CEQA §15150, an EIR may incorporate by reference all or portions of another document which is a matter of public record or is generally available to the public. The incorporated portions of other documents are considered in full as part of the text of the EIR. The EIR must indicate where the incorporated document is available for public review, and the EIR should briefly summarize or describe the referenced information and describe the relationship of the referenced document to the EIR analysis.

The following documents are incorporated by reference and available for review to gain an understanding of previously completed analysis of Zone 7's water supply planning efforts, and as background material for the proposed project:

- Draft Technical Memorandum – Flooding Conditions with SMMP Regional Storage Implementation. Prepared by RMC, November 22, 2005.
- *Stream Management Master Plan* - 2006, prepared by RMC, for Zone 7 Water Agency
- Draft Technical Memorandum SMMP Phase 2: Sediment Balance (RMC, June 2004)
- Draft Technical Memorandum SMMP Phase 2: Project Refinements/Diversion Frequency [at Chain of Lakes] (RMC, September 2004)
- Draft Technical Memorandum SMMP Phase 2: Chain of Lakes Project Refinements (RMC, October 2004)
- Draft Technical Memorandum SMMP Phase 2: Arroyo da la Laguna Hydraulic Grade Line Analysis (RMC, October 2004)
- *Zone 7 Water Agency Water Supply Planning Program – Program EIR*, January 1999 (SCH No. 98041040), prepared by Environmental Science Associates. The document was certified by Zone 7 Board of Directors on January 21, 1999

These documents are available for review during business hours at the Zone 7 Water Agency Administrative Office, located at 100 North Canyons Parkway, Livermore, CA 94550.

CHAPTER 2

Project Description

2.1 Introduction

Zone 7 of the Alameda County Flood Control and Water Conservation District (Zone 7), is one of the ten active zones of the Alameda County Flood Control and Water Conservation District (ACFCWCD), a special district established by the State Legislature in 1949. Zone 7 was established by popular vote of the residents of the Livermore-Amador Valley in 1957 under an amendment to the District Act. The service area comprises 426 square miles in eastern Alameda County (see **Figure 2-1**) and includes the cities of Pleasanton, Livermore and Dublin as well as the surrounding unincorporated Alameda County lands. Zone 7 provides the following services:

- Wholesale treated and untreated water supply
- Groundwater management
- Flood control

Zone 7 has developed a Stream Management Master Plan (SMMP) to serve as an update to their existing 1966 Flood Control Master Plan and to meet several objectives related to the provision of flood control and stream management within its service area. In recent years, there have been a number of changes that impact the way agencies approach the management of streams. In recognition of these changes, Zone 7 began development of the SMMP in September 2002. The purpose of the SMMP is to develop a master plan that addresses flood protection and drainage issues, as well as other issues affecting management of the streams and arroyos such as dry channels that are subject to flash flooding during seasonal or irregular rain storms. The SMMP project area includes all arroyos and flood control channels located within 426 square miles of the Alameda Creek watershed that encompasses the Zone 7 service area (see **Figure 2-2**). The SMMP focuses on a multi-disciplinary approach to management by looking not only at flood protection, but other resource areas affected by stream management and identifies opportunities for other local agencies and Zone 7 to guide the implementation of flood protection and stream management activities in the Livermore-Amador Valley. As such, the SMMP focuses on six resource areas:

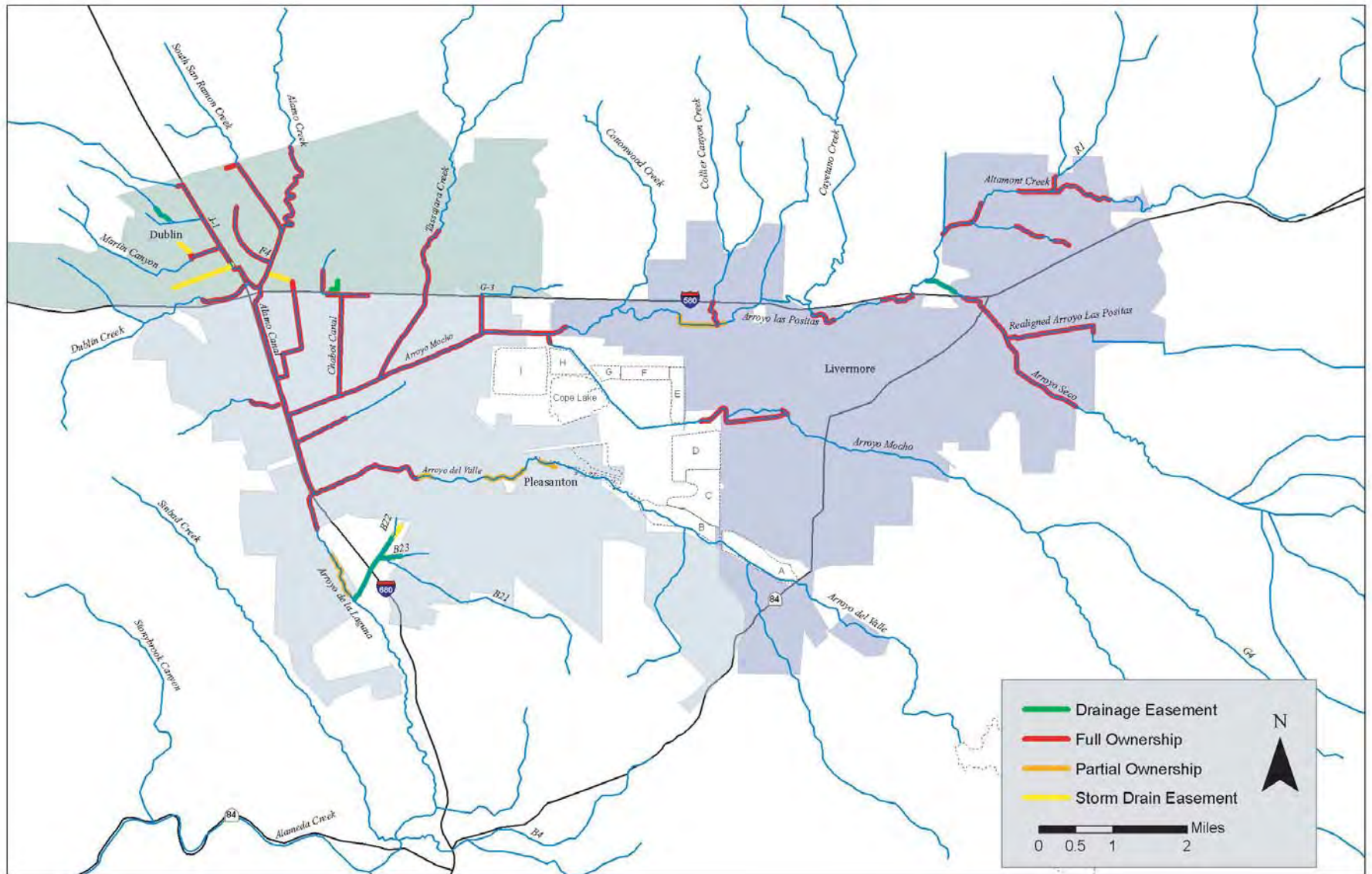
- Flood Protection and Drainage
- Erosion and Sedimentation
- Water Supply
- Water Quality
- Habitat and Environment
- Recreation, Trails and Public Education



SOURCE: RMC, 2004

Zone 7 SMMP . 203485

Figure 2-1
Zone 7 Service Area and
SMMP Project Area



SOURCE: RMC, 2004

Zone 7 SMMP . 203485

Figure 2-2
Stream Channels and Ownership,
SMMP Project Area

As part of the SMMP process, Zone 7 identified a specific goal for each of these resource areas, then identified multiple objectives for each goal. These objectives were then used to guide the development of individual projects. Detailed descriptions of each project are included in **Appendix 2.0**. Project development was coordinated with a process that involved stakeholder meetings with other agencies and interested parties within the upper Alameda Creek watershed. Through this process, Zone 7 has identified a series of projects to meet the SMMP goals and objectives, thereby updating Zone 7's existing 1966 Flood Control Master Plan.

In compliance with Section 15000 of the CEQA Guidelines, Zone 7 will be the lead agency for preparation and circulation of a Master Environmental Impact Report (MEIR) which will examine potential impacts associated with implementation of the Zone 7 SMMP. Zone 7 intends to utilize this MEIR to complete the public review process required under CEQA for the SMMP. Implementation of individual projects will be reviewed under the MEIR for the need to complete additional project-specific environmental documentation.

2.2 Project Location and Overview

As the Valley's water "wholesaler", Zone 7 sells treated water primarily to four retail water agencies: the City of Pleasanton, the City of Livermore, the Dublin San Ramon Services District (DSRSD) and the California Water Services (CWS) Company. It also sells untreated water directly to agricultural customers.

Flood control within the SMMP project area is primarily under the jurisdiction of Zone 7. Zone 7 provides both routine maintenance and emergency repairs on the channels it owns. Currently, Zone 7 owns and maintains approximately one-third of the Valley's channels or creeks, i.e., 39 miles of the 120 miles of local flood control channels and streams (including arroyos) on the Valley floor. The other two-thirds of the Valley's stormwater conveyance and drainage system is owned by other local agencies or private property owners. Channels owned by Zone 7 are shown in **Figure 2-2**. The Special Drainage Area (SDA 7-1) Program, which is funded by developer fees, is currently the Agency's only source of revenue for improvements to the existing flood control system.

In the past, flooding has occurred within the Livermore-Amador Valley at several locations, including: Arroyo de la Laguna (ADLL) between Arroyo Mocho and Bernal Avenue; Arroyo Mocho between Alamo Canal and Santa Rita Road; and at the confluence of Arroyo las Positas and Arroyo Mocho, including flooding along Stanley Boulevard and El Charro Road (Zone 7, 2001). Additional areas have been impacted by flooding, and include the reach of ADLL from above its confluence with Arroyo Mocho to the San Francisco Public Utilities Commission's (SFPUC) Bernal Property. These impacts have been limited primarily to channel damage and repair.

Zone 7 also, if possible, provides maintenance and emergency repairs of channels that it owns in order to ensure the channels are ready to convey flows. These activities are funded through property taxes. There are three types of maintenance activities: routine maintenance, major maintenance, and emergency maintenance. Routine maintenance activities include debris removal, vegetation/weed

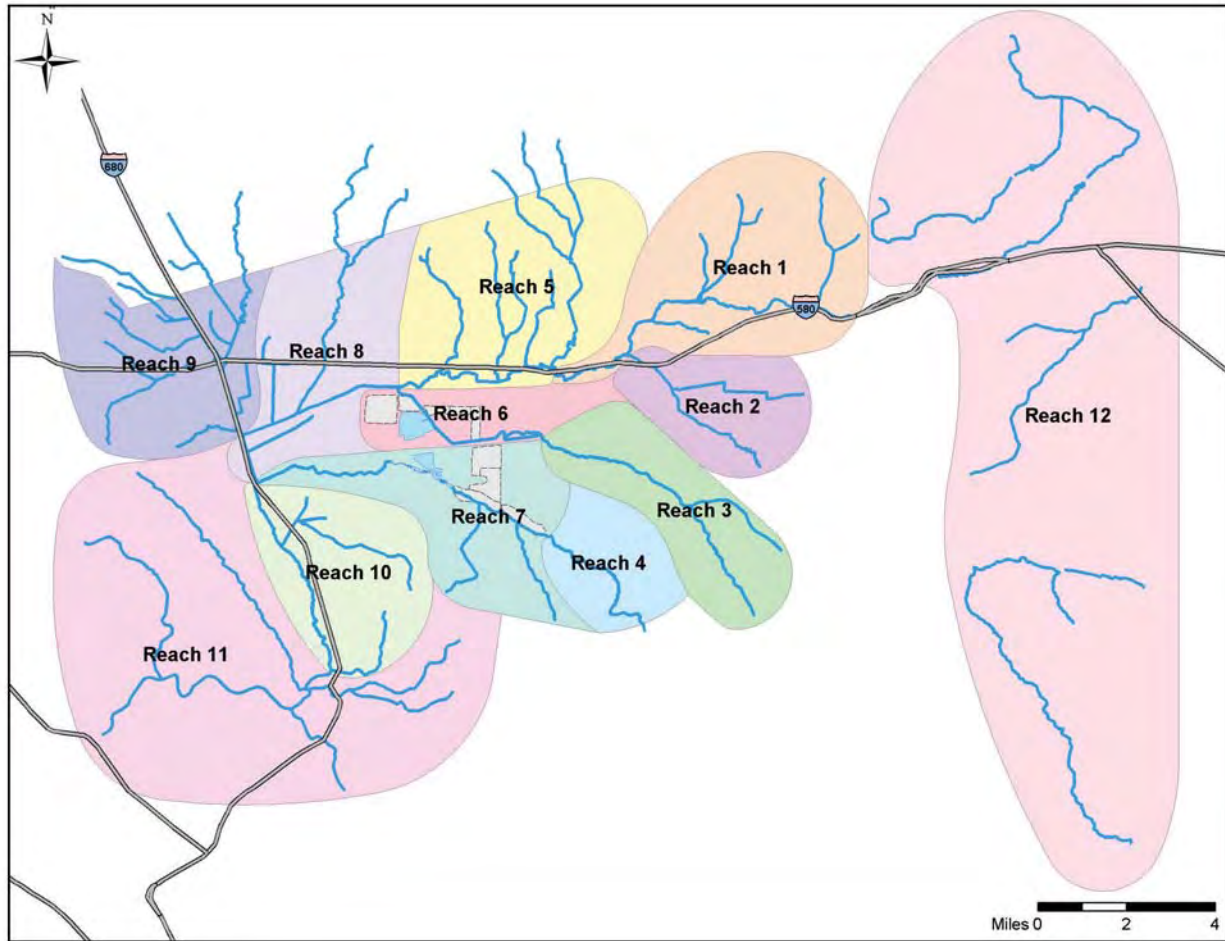
management, and clearing of drainage structures. Major maintenance activities include repair of slides and toe erosion, and channel desilting activities. Emergency maintenance could include any of the routine or major maintenance activities, but would occur on an as needed basis following rain events or other activities that require immediate action. Flood control maintenance activities are funded through local property taxes.

To effectively identify SMMP needs and opportunities, the Zone 7 service area was divided into 12 individual reaches. These reaches are described below and shown in **Figure 2-3**. Individual reaches are further discussed in Chapter 3.0, Existing Conditions.

Reach 1 is located in northeast Livermore, north of Interstate-580 (I-580), except for a westerly finger, extending south of I-580 to Cayetano Creek and to the east and west of Vasco Road. Reach 1 includes Altamont Creek, Line S, Line R1, and a section of Arroyo las Positas. Expansion of additional flood protection is not a major concern in Reach 1. There are erosion and sedimentation issues associated with Altamont Creek and Arroyo las Positas. Vegetation affects sedimentation on Upper Arroyo las Positas. Heavy down-cutting is evident on Arroyo las Positas downstream of line S-1 and along I-580. The creeks in this reach convey water from the South Bay Aqueduct (SBA) to groundwater storage. Because of local geology, the surface water in this reach has high salt content. The Regional Water Quality Control Board (RWQCB) has listed streams in this area as impaired for diazinon, a pollutant common in urban stormwater runoff. Special-status species such as California tiger salamander and California red-legged frog occur in Reach 1 (see Section 3.5, Biological Resources). In addition, the Springtown Natural Communities Reserve is located in Reach 1 and presents an opportunity for preservation and enhancement. The Springtown Reserve is characterized by wetlands, scrub and grasslands with alkali sink scrub, and vernal pool habitat. Reach 1 has many streamside trails with some trail gaps.

Reach 2 is located in northeast Livermore and continues east adjacent to Lawrence Livermore National Laboratories (LLNL). This reach is highly urbanized. It includes the realigned Arroyo las Positas and Arroyo Seco, owned by the City of Livermore. Potential flooding issues have been identified for Reach 2 at a series of three bridges on Arroyo Seco. They are located at the First Street crossing, South Front Road crossing and Arroyo Vista crossing. The Realigned Arroyo las Positas north and west of LLNL has problems with high velocity and erosion. Due to the urban nature of Reach 2, there is little habitat potential. A few special-status species have been observed, including California red-legged frogs and burrowing owls (see Section 3.5, Biological Resources). The minimal amount of potential habitat coupled with security requirements at LLNL diminish potential for habitat enhancement in this reach.

Reach 3 is located south of Reach 2, extending southeasterly from Stanley Boulevard and includes a section of Arroyo Mocho and Line G4. The “Chain of Parks” area, which extends from Robertson Park to Mocho Park, is the primary feature in this reach. The current and future FEMA 100-year floodplains in this reach are primarily located within the Chain of Parks area, but also extend downstream near Valley Memorial Hospital. Although there is no evidence of an established historical steelhead presence, sedimentation, gravel transport, and deposition are serious issues along Arroyo Mocho. Gravel deposition at Holmes Street and Stanley Boulevard



SOURCE: RMC, 2004

Zone 7 SMMP . 203485
Figure 2-3
Reach Designations, Zone 7
SMMP Project Area

bridges has resulted in capacity issues at those two locations. An upstream alluvial fan is the source of gravel deposition and is considered the largest source of sediment in the Valley's system. Arroyo Mocho is an important source of groundwater recharge in Zone 7, particularly where it intersects with the SBA, as it is part of the Zone 7 Artificial Stream Recharge Program. Because of this important function, protection of the function and quality of Arroyo Mocho's water is a priority. Like other urbanized reaches in the project area, diazinon and other pollutants of concern are an issue in Reach 3. Fish barriers are an impediment to habitat enhancement in this reach. Removal or modification of the old railroad bridge at Stanley Boulevard would help to achieve future fish migration. Potential habitat for California red-legged frog, western pond turtle, and special-status species bats occurs on land adjacent to upper reaches of Arroyo Mocho and enhancement of this habitat is another potential improvement for Reach 3. Reach 3 has an extensive trail system that could be extended upstream for additional recreational access. Schools in the area present opportunities for education and outreach.

Reach 4 lies between Reaches 3 and 7 and includes a section of Arroyo del Valle (downstream of Lake del Valle to Highway 84). Sycamore Grove Park, one of the largest and oldest sycamore groves in California, is located in Reach 4. Flood control and drainage for Reach 4 is regulated by Lake Del Valle Reservoir. This reach is important to groundwater recharge. It is part of the Zone 7 Artificial Stream Recharge Program. There is speculation that sycamore health problems could be correlated with the hydrology of Arroyo del Valle and research is underway to address this issue. Invasive plant species and anthracnose are also stress factors for the Reach 4 sycamores. Enhancement of habitat for plants and animals is critical for this reach. Connecting Sycamore Grove Park trails to others outside the park is a potential improvement for Reach 4.

Reach 5 is located in Livermore immediately west of Reach 1 and includes Arroyo las Positas parallel to I-580, downstream to the confluence with Arroyo Mocho. Reach 5 also includes several smaller drainages north of I-580, such as Cottonwood Creek, Collier Creek, an unnamed drainage, and Cayetano Creek, all of which drain to Arroyo las Positas. The Arroyo las Positas Golf Course is also a part of Reach 5 and lies just north of the Livermore Airport and the Chain of Lakes area. The Chain of Lakes area consists of a series of gravel quarry lakes, which is scheduled to be turned over to Zone 7 by 2030 for water resources purposes after the gravel mining operations are completed. Channel capacity is a serious issue along Arroyo las Positas in this reach and the FEMA 100-year floodplain extends along areas to the north and south of the channel in this reach. Capacity constraints in this reach are exacerbated by sediment accumulation in several key locations including Airway Boulevard and at the confluence of the unnamed channel under I-580. As such, sediment removal and management are needed in this reach. Water quality in Reach 5 is influenced by its location downstream of Reach 1 and high total dissolved solids is the result of soil conditions in Reach 1. Protection of habitat for California tiger salamander and California red-legged frog is important in this reach. In addition, there is opportunity for trail connections and extensions in this reach.

Reach 6 is centrally located in the SMMP project area immediately south of Reach 5 and west of Reach 2. It includes a section of Arroyo Mocho downstream of Stanley Boulevard to just downstream of its confluence with Arroyo las Positas, Chain of Lakes E through I, and Cope

Lake. The majority of this reach is located within the FEMA 100-year floodplain so flooding issues are a priority in Reach 6. Capacity issues with Arroyo las Positas and Arroyo Mocho are the primary cause of these problems. The historic and ongoing gravel mining in the Chain of Lakes area is scheduled to end by 2030 and some of the mined gravel pits would be turned over to Zone 7 for water resources purposes following completion of gravel mining activities. Zone 7 monitors these “lakes” and currently manages Lake I and Cope Lake, with transfer of Lake H pending. Zone 7 anticipates using the Chain of Lakes area to potentially address several flood control and conveyance issues: storage and recharge of potable water supply, storage of non-potable water supply, and storage of stormwater during high flow events. Arroyo Mocho has a gravel deposition problem through much of the reach and bed load removal and management are needed. Arroyo Mocho in this reach is crucial for groundwater recharge and surface water storage and it is part of the Zone 7 Artificial Stream Recharge Program. Zone 7 plans on using the Chain of Lakes for potable water storage and recharge of the groundwater basin. Lakes H and I provide the best opportunities since the permeable soils on the sides of these lakes allow for infiltration into the groundwater basin. Recharge at Cope Lake is not feasible due to its silt bottom, which significantly diminishes infiltration of water from Cope Lake into the groundwater table. Like other urbanized reaches in the watershed, diazinon is an issue in Reach 6. Source control and increasing protection measures to maintain security could help attenuate this problem. Additional improvements could include removal or modification of fish barriers, removal of invasive species, and increasing the amount of appropriate riparian cover. Opportunities to close gaps in trails and create other recreational opportunities exist in Reach 6.

Reach 7 is located south of Reach 6 and west of Reach 4. Reach 7 includes Arroyo del Valle (downstream of Highway 84 to its confluence with ADLL at I-680), upper Chain of Lakes (Lakes A through D) and the Shadow Cliffs recreation area. Flows in this reach are regulated by Lake Del Valle Reservoir and therefore flood control is not a significant issue. However, some flood control maintenance related to modification of storm drain outfalls and flap gates is needed in Reach 7. Arroyo del Valle is included in Zone 7’s Artificial Stream Recharge Program. The upper Chain of Lakes will be important to water supply management when placed under Zone 7 management. Diazinon and other pollutants of concern are an issue in Reach 7. Arroyo del Valle is a potential steelhead corridor and removal of fish barriers is a significant potential improvement in this reach. Enhancement of riparian cover would also improve the habitat in Reach 7. Improvements to recreational trails would be valuable in this reach.

Reach 8 is located in Dublin and Pleasanton, on either side of I-580 and extends westward to the I-580/I-680 interchange. It includes the final segment of Arroyo Mocho (from Arroyo las Positas to ADLL), Line G-3, Tassajara Creek, Chabot Canal, Pleasanton Canal, and the upper segment of ADLL. Pleasanton/Dublin BART station and the Hacienda Business Park are located in this highly urbanized reach. The 100-year floodplain in this reach is limited to areas adjacent to Chabot Canal upstream of I-580. The Federal Emergency Management Agency (FEMA) floodplain in this reach used to include parts of the Valley Trails and Del Prado neighborhoods. Based on an August 2005 letter of map revision (LOMR) approved by FEMA, the Valley Trails neighborhood was removed from the floodplain. Additional letters of map amendment (LOMAs) have also been recently submitted by property owners in the Del Prado neighborhood. These

LOMAs have been approved by FEMA and the Del Prado floodplain will be removed in the next flood insurance rate map (FIRM). As such, some local and regional flood protection and drainage improvements are needed to provide 100-year flood protection in Reach 8. Heavy sedimentation is prevalent in this reach. This reach is not an integral area for water supply or aquifer recharge. Fine sediment removal could increase this function in Reach 8. Diazinon and other pollutants of concern are an issue in Reach 8. Maintaining passage for steelhead is also important in this reach. There is high potential for expansion of trails to connect to residential and commercial areas in this reach.

Reach 9 lies to the north and west of Reach 8, on either side of the intersection of I-580/I-680 in Dublin and Pleasanton. Reach 9 includes Line G-1-1, Alamo Canal, Lines F-4 and F-6, Alamo Creek, South San Ramon Creek, and Lines J-1 to J-5. Flood issues are limited in Reach 9. Erosion and sedimentation issues are present in Reach 9. Noticeable areas include Alamo Canal and South San Ramon Creek near its confluence with Alamo Creek. This reach is not an integral area for water supply or aquifer recharge. The waterways in Reach 9 are not classified as having impaired water quality. Reach 9 provides suitable breeding and basking habitat for western pond turtle (see Section 3.5, Biological Resources) and preservation of this habitat is an important potential improvement. There is a significant gap in the trail along Alamo Canal in Dublin north of I-580 and along Alamo Canal south of I-580; therefore, extending this trail is a potential improvement for this reach.

Reach 10 occupies an area south of Reach 7, on either side of I-680 in Pleasanton, down to an area just north of Sunol. It includes a major segment of ADLL, and Lines B-2-1, B-2-2, B-2-3, B-2-4, and B-2-5. Coordinating efforts with other agencies along ADLL is an opportunity in Reach 10. The 100-year floodplain in this reach extends along the channel banks and onto SFPUC property, south of the Bernal Bridge. Bank erosion is significant in some areas of Reach 10. Specific areas of concern are downstream of Bernal Bridge and near Verona Bridge where adjacent properties are threatened. Bank stabilization may be necessary in these locations and others. Erosion problems also occur at the confluence of B21-1 and ADLL and may need to be addressed. After removal of downstream barriers, ADLL will be critical to steelhead passage. Preservation and enhancement are necessary in Reach 10. Improvements to trails and other recreational opportunities would be an improvement to Reach 10.

Reach 11 is located to the west of Reach 10, wrapping around the southern end of Reach 10. Reach 11 includes Alameda Creek to the City of Fremont limits, Vallecitos Creek, Sinbad Creek, and Stonybrook Creek. Erosion is an issue in the lower reaches of Sinbad Creek. Diazinon and other pollutants of concern are an issue in Reach 11. Connecting the SMMP trail system to the Alameda Creek trail is an opportunity in this reach.

Reach 12 is located in the easternmost part of Zone 7's service area and includes a large swath of land east of Reach 1 and to the north and south of I-580 to Alameda County's boundaries. This area drains towards San Joaquin County and is mostly undeveloped. Eroded stream bed walls are characteristic of the upland areas of Reach 12. Implementation of bank stabilization could improve conditions.

2.3 Project Need and Objectives

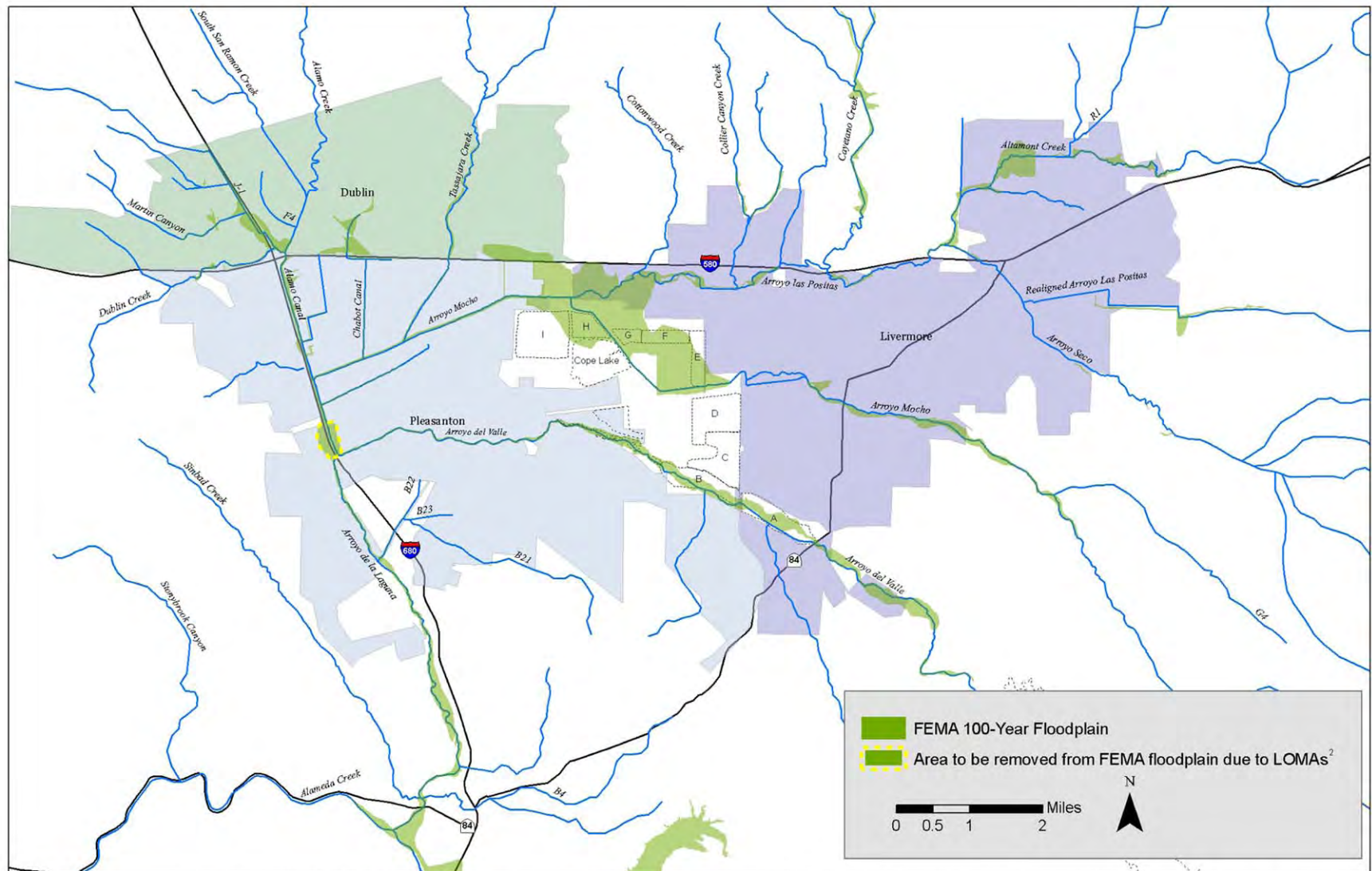
Project Need

Within available resources and regulatory constraints, Zone 7 is responsible for managing stormwater flows in the Livermore-Amador Valley area within the major drainage ways of the Valley floor. As this valley becomes transformed from rural to suburban land uses, the potential for flooding has increased. This increase is primarily due to expansion of impervious surfaces resulting from construction of buildings, parking lots and roadways. The reduction of natural floodplains and arroyos through conversion into trapezoidal channels has also contributed to the increase. Zone 7 has conducted a series of flood protection studies over the years, and initiated an update to their 1966 Flood Control Master Plan through technical work conducted by West Yost and Associates in 2001, and subsequent development of the SMMP.

There is a potential for flooding in the Valley. The floodplain for the 100-year storm event was mapped by the Federal Emergency Management Agency (FEMA) in the 1980s and was updated in 1997. FEMA's hydrologic analyses used to develop the floodplain boundaries are based on the 1997 development conditions as well as 1970s development conditions in the case of ADLL, Alamo Canal, and Arroyo Mocho (downstream of its confluence with Arroyo las Positas). **Figure 2-4** shows the original FEMA floodplain modified to exclude areas where LOMRs have been adopted by FEMA. These areas include lands adjacent to Altamont Creek (in northeast Livermore), areas within the Chain of Lakes, and the area between the confluence of ADLL and Arroyo Mocho.

The 100-year floodplain boundaries affect the properties located in Pleasanton, Dublin, Livermore, and unincorporated areas in Alameda County. The areas include the following:

- Area around the Chain of Lakes in the City of Livermore, bound to the west by the confluence of Arroyo Mocho and Arroyo las Positas, and to the east by Isabel Avenue;
- The Springtown Natural Communities Reserve along Altamont Creek, in the northeast corner of the City of Livermore;
- Areas in Dublin, upstream of Interstate I-580 (I-580) discharging to Chabot Canal and adjacent to the I-580 and Interstate I-680 (I-680) crossing;
- Lands along Arroyo Mocho, within the Chain of Parks area (from Robertson Park to Mocho Park) and adjacent to Valley Memorial Hospital; and
- Smaller areas along Realigned Arroyo las Positas, Arroyo del Valle, and lower ADLL.



¹ This floodplain map represents a modified version of the 1997 FEMA floodplain map. Modifications were made to exclude significant areas where LOMRs have been developed for the cities of Livermore, Dublin, and Pleasanton. This map reflects current flow conditions.

² The area of Pleasanton located within the dotted yellow line will be removed from the 100-year event FEMA floodplain due to recently filed LOMAs not yet reflected in the FEMA floodplain map (City of Pleasanton, February 2006).

SOURCE: FEMA 1997 FIS

Zone 7 SMMP . 203485

Figure 2-4
100-year Floodplain

Resource Area Goals and Objectives

The SMMP has been developed to address the potentially damaging flooding issue, while also considering other resource areas affected by management of flood channels and arroyos. Specific SMMP goals for each resource area are presented in **Table 2-1**. **Table 2-2** develops specific objectives for each of the goals. These goals and objectives were used to guide the development of individual projects identified under the SMMP.

TABLE 2-1
SMMP RESOURCE GOALS

Resource Area	SMMP Goal
Flood Protection and Drainage	Protect people, property, and stream corridors from damaging drainage and floods.
Erosion and Sedimentation	Reduce or manage erosion and sedimentation in a manner that is compatible with other stream resources.
Water Supply	Provide adequate conveyance of water for recharge and storage needs.
Water Quality	Protect and enhance water quality of streams and groundwater.
Habitat and Environment	Protect and enhance aquatic and riparian habitat associated with streams and wetlands.
Trails, Recreation, and Public Education	Promote recreational, alternative transportation, and public education opportunities along streams and the Chain of Lakes.

Flood Protection and Drainage

The Livermore-Amador Valley (TriValley) is subject to significant flooding during major storm events. To address this issue, Zone 7 has identified flood protection projects based upon the primary goal of flood protection and additional objectives identified to guide the project development process.

Erosion and Sedimentation

The Valley's stormwater conveyance and drainage system has experienced erosion and sediment problems throughout the channel network. Excessive sediment affects flood channel capacities and prevents storm drains and outfalls from functioning properly, resulting in potential effects on drainage and flooding resulting in property damage. Additionally, excessive sediment deposition or erosion in channels also affects water quality by impacting water temperature, nutrient loading, and turbidity. Excessively turbid water could in turn affect water supply by negatively impacting groundwater recharge programs in the TriValley and further downstream in the Fremont area. Channel stability in many areas varies, and has led to bank erosion at many locations, which threatens properties located along channel banks.

TABLE 2-2
SMMP RESOURCE GOALS AND OBJECTIVES

Resource Area	Goal	Objectives
Flood Protection and Drainage	Protect people, property and stream corridors from damaging drainage and floods	A. Design and maintain streams and flood protection facilities to convey design flows while supporting natural ecosystem functions to the greatest extent possible. B. Implement improvements to flood protection system necessary to manage 100-year storm event at General Plan land use conditions. C. Modify FEMA 100-year flood zone as necessary to protect people and property. D. Promote multi-use concept for flood protection facilities. E. Promote coordination of flood protection and drainage projects between agencies.
Erosion and Sedimentation	Reduce or manage erosion and sedimentation in a manner that is compatible with other stream resources	A. Implement improvements necessary to eliminate or mitigate the effects of erosion and sedimentation on flooding, water quality, and native habitats. B. Develop long-term strategies as needed to streamline the permitting of sediment removal required to meet the flood protection and sediment objectives. C. Conduct sediment management and maintenance activities on flood protection facilities in a manner that allows conveyance of design flows while supporting natural ecosystem functions to the greatest extent possible.
Water Supply	Provide adequate conveyance of water for recharge and storage needs	A. Maintain adequate recharge capacity in average and drought years in Arroyo del Valle, Arroyo Mocho and Chain of Lakes to comply with Zone 7 groundwater management strategies. B. Maximize potable source water storage and recharge potential in Chain of Lakes. C. Maximize storage of non-potable supplies in Chain of Lakes, as appropriate. D. Coordinate storage and recharge strategies with plans for delivery of potable and non-potable water. E. Maintain streams and Chain of Lakes to accomplish storage and recharge objectives. F. Provide adequate water quantity to sustain native fisheries and other aquatic life.
Water Quality	Protect and enhance water quality of streams and groundwater	A. Protect surface and groundwater supplies. B. Coordinate with local and regional agencies to facilitate compliance with state and federal non-point source NPDES requirements. C. Minimize erosion and sediment accumulation in streams. D. Coordinate with local and regional agencies to eliminate impaired water body designations. E. Provide adequate water quality to sustain native fisheries and other aquatic life. F. Maintain streams and Chain of Lakes to meet above requirements.

TABLE 2-2 (continued)
SMMP RESOURCE GOALS AND OBJECTIVES

Resource Area	Goal	Objectives
Habitat and Environment	Protect and enhance aquatic and riparian habitat associated with streams and wetlands	A. Integrate environmental and habitat requirements into projected water management practices. B. Promote sustainable, native habitats wherever possible. C. Preserve and enhance stream buffers and riparian areas. D. Protect existing and create new wetlands with multiple use. E. Promote environmentally sensitive sediment removal practices. F. Maintain streams and Chain of Lakes to meet above objectives.
Trails, Recreation, and Public Education	Promote recreational, alternative transportation, and public education opportunities along streams and the Chain of Lakes	A. Promote community involvement in stream stewardship. B. Provide educational opportunities for students and the general public. C. Cooperate with local and regional agencies to implement appropriate recreational features along streams and the Chain of Lakes. D. Promote trails and recreation features that provide connectivity to existing or future planned trails, and recreational areas or facilities. E. Protect or enhance visual resources along streams. F. Incorporate public safety measures into recreational features along streams and Chain of Lakes. G. Promote the expansion of trails to develop alternative, non-motorized transportation corridors along the streams and arroyos.

Water Supply

Zone 7 is a wholesale water agency supplying both treated and raw water to a variety of users and for a variety of uses. Zone 7's water supply comes from the State Water Project, local groundwater basins, and through water transfers. Zone 7 is planning on using portions of the Chain of Lakes for storage and groundwater recharge. Untreated water is conveyed through several local arroyos, which are also used for groundwater recharge.

Water Quality

The regulatory requirements and standards for drinking water quality and stormwater quality are different. However, there is a relationship between the quality of water supply and stream management within Zone 7, since many of the local arroyos are used for conveyance of untreated water supplies and recharge of groundwater supplies.

Zone 7's treated water supply meets all drinking water standards. Stormwater quality discharges are permitted under the Alameda Countywide Clean Water Program National Pollutant Discharge Elimination System (NPDES) Municipal stormwater permit. Zone 7 addresses stormwater quality and protection through their compliance with the Countywide permit and participation in the Alameda Countywide Clean Water Program. Stormwater quality issues in the Zone 7 service area are similar to those faced by other urban areas in the Bay Area, and include diazinon, a pollutant resulting from urban runoff, which has been identified in many Zone 7 streams.

Habitat and Environment

Much of the natural habitat in the Livermore-Amador Valley has been developed into urban communities. However, arroyos and streams provide great opportunities for preserving, enhancing and restoring natural habitat areas and migratory corridors. Zone 7's mission is to develop and manage water resources in an environmentally sensitive way and minimize impacts to the natural habitat.

Trails, Recreation, and Public Education

Zone 7 believes that an educated public will help protect the watershed and groundwater basin. There are several education and outreach programs in existence. In 1984, the Zone 7 Board of Directors decided to make available to local parks and recreation provider agencies, its right-of-way along streams to include recreational opportunities and open space. There are many proposed trails in the SMMP and coordination with local interest groups, schools and recreation agencies is an important element in the plan.

2.4 Project Description

The SMMP includes a series of projects developed to meet defined goals within each of the resource areas identified in **Table 2-1** above. The SMMP includes 45 individual projects intended to be multidisciplinary, that is, they are intended to meet as many of the resource area goals and

objectives as possible in order to provide multiple benefits and identifies opportunities for other local agencies to guide the implementation of Zone 7 flood protection related projects. In general, the SMMP would result in restoration of channel capacity within the project area through implementation of regional storage, sediment removal, low-flow channel installation, wetland creation, and riparian corridor enhancement to provide bank stabilization. Projects implemented under the SMMP would develop regional storage at the existing Chain of Lakes, and would implement one-time sediment removal on a project-by-project basis to reestablish channel capacity for 19,075 linear feet of channel. Other channel capacity improvements would include use of flood walls along the top of existing embankments, channel widening, and removal of in-channel maintenance roads to improve channel capacity. SMMP implementation would also include the following riparian and habitat enhancements to existing stream channels: establishment of 40,000 linear feet of low-flow channel, implementation of riparian planting and vegetation management along 76,300 linear feet of channel bank, and application of invasive species control along 21,000 linear feet of channel bank. To more effectively manage sediment deposition and removal, the SMMP includes establishment of 6 sediment basins, and includes implementation of bio-technical bank stabilization along 61,489 linear feet of channel bank to reduce bank failure and erosion. The SMMP includes creation of 28 acres of in-stream and off-channel wetlands, dedication of 22 acres for habitat conservation, and dedication of 146 acres of land for floodplain management. The SMMP would remove 10 existing fish barriers within the Upper Alameda Watershed, and would create 36.7 miles of multi-use recreational trail along existing stream channels. A list of individual projects and resource areas addressed by each project is provided in **Table 2-3**. **Table 2-4** includes a summary description of project purpose, components, and resource area goals each project addresses. This document identifies individual projects using the nomenclature provided by the SMMP, which identifies each project by the reach and project number within the reach. Appendix 2.0 includes more detailed SMMP descriptions of each of the projects listed on Tables 2-3 and 2-4. The general location of each project within the watershed is identified in **Figure 2-5**. The following sections briefly describe some of the projects included within each reach, and further depict the location of each project, by reach. As noted above, a more detailed description of each of the 45 SMMP projects is located in **Appendix 2.0**.

Reach 1 Projects

Projects in Reach 1 include trail creation, habitat enhancement, flood control and conveyance, bank stabilization, and wetlands creation. The locations of the seven projects included in Reach 1 are demonstrated on **Figure 2-6** and a complete description of each project is included in **Appendix 2.0**. This reach includes projects such as the Alkali Sink Management project (R.1-2), which would enhance habitat in the Springtown Natural Communities Preserve. Alkali sink scrub and vernal pools in Springtown Natural Communities Reserve provide habitat for special-status species including California tiger salamander and bird's beak (see **Section 3.5, Biological Resources**). This project would protect alkali sink scrub habitat and provide flood protection to areas downstream of the Springtown Natural Communities Reserve. The project would also include dedication of a buffer around the reserve and an adjustable weir would be constructed to divert part of Altamont Creek flood flows into the reserve. An additional educational signage or kiosk would be installed regarding the preservation of the bird's beak habitat.

**TABLE 2-3
SUMMARY OF MULTIPLE PROJECT GOALS,
BY INDIVIDUAL PROJECT AND REACH**

Reach/Project	Flood Protection and Drainage	Erosion and Sedimentation	Water Supply	Water Quality	Habitat and Environment	Trails, Recreation, and Public Education
Reach 1						
R.1-1		•		•	•	•
R.1-2	•				•	•
R.1-3	•	•		•	•	
R.1-4	•				•	
R.1-5		•		•	•	•
R.1-6		•		•	•	•
R.1-7	•					•
Reach 2						
R.2-1	•	•		•	•	•
R.2-2	•				•	
R.2-3						•
Reach 3						
R.3-1			•		•	
R.3-2	•	•		•	•	•
R.3-3	•			•	•	•
R.3-4	•	•			•	•
R.3-5					•	•
Reach 4						
R.4-1			•		•	
R.4-2						•
Reach 5						
R.5-1						•
R.5-2	•	•		•	•	•
R.5-3	•	•	•			
Reach 6						
R.6-1				•	•	•
R.6-2	•		•	•		•
Reach 7						
R.7-1						•
R.7-2						•
R.7-3	•				•	•
Reach 8						
R.8-1		•		•		•
R.8-2	•					•
R.8-3	•	•		•	•	•
R.8-4	•	•		•	•	•
Reach 9						
R.9-1		•		•	•	
R.9-2		•				
R.9-3	•	•				
R.9-4	•					
R.9-5						•
R.9-6		•		•	•	
R.9-7	•	•		•	•	
Reach 10						
R.10-1		•		•	•	•
R.10-2	•	•		•	•	•
R.10-3	•	•		•	•	•
R.10-4	•	•		•	•	•
R.10-5	•	•		•	•	•
Reach 11						
R.11-1						•
R.11-2		•		•		•
Reach 12						
R.12-1		•		•		•
R.12-2		•		•		•

**TABLE 2-4
DESCRIPTION OF SMMP PROJECTS**

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
Reach 1				
R.1-1	Altamont Creek Improvements	To create a system of regional trails and provide connectivity between existing trails.	- Construct a trail from Broadmoor Street to Vasco Road. - Construct a multi-purpose trail from Laughlin Road to Brushy Peak/Del Valle Trail. The project includes acquisition of 1.4 acres for the trail component. - Conduct sediment management activities including constructing a 0.5 acre-feet (AF) sediment basin in Altamont Creek. Acquire 0.5 acres for the sediment basin. Sediment would be removed along Altamont Creek to restore the channel capacity. Create 1.2 acres of wetlands as environmental mitigation for sediment management activities.	- Trails, Recreation, and Public Education - Erosion and Sedimentation - Water Quality - Habitat and Environment
R.1-2	Alkali Sink Management	To protect and enhance habitat in the preserve.	- Dedicate 100 feet of buffer around the Springtown Natural Community Reserve - Construct a regulated gate or adjustable weir to divert a portion of Altamont Creek flood flows into the Springtown Natural Community Preserve. - Install additional educational signage/kiosk regarding the preservation of the bird's beak habitat. - Conduct vegetation management activities including invasive species control along 2,500 feet of both banks of Altamont Creek.	- Flood Protection and Drainage - Habitat and Environment - Trails, Recreation, and Public Education

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.1-3	Springtown Improvements	To curtail aggradation of Altamont Creek by trapping sediment loads from upstream in a sediment basin. Decrease potential for flooding in the vicinity of Bluebell Bridge during a 100-year flood event.	- Construct a 2.75 AF sediment basin in Altamont Creek just downstream of the Bluebell Drive Bridge. - Create approximately 1.4 acres of wetlands as environmental mitigation for creation of sediment basin. - Modify bridge at Bluebell Drive crossing to increase sediment conveyance at bridge crossing and reduce the potential for flooding. - Conduct vegetation management activities including invasive species control along 1,000 feet of Altamont Creek.	- Flood Protection and Drainage - Erosion and Sedimentation - Water Quality - Habitat and Environment
R.1-4	Springtown Golf Course Improvements	To implement improvements to protect the Springtown Golf Course from flooding during a 100-year flood event.	- Create a low-flow meandering channel on Arroyo las Positas to enhance habitat for special-status species. - Conduct vegetation management activities (recurring), including invasive species control and riparian vegetation planting at Arroyo las Positas for 2,500 feet. - Replace double culvert barrel at Arroyo las Positas crossing with pedestrian bridge at Springtown Golf Course. - Conduct in-stream vegetation management including invasive species control, over 1.21 acres upstream of Bluebell Drive. Includes acquisition of 1.6 acres of stream for vegetation management.	- Flood Protection and Drainage - Habitat and Environment

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.1-5	Arroyo las Positas Habitat Enhancement and Recreation Project	To create a system of regional trails and enhance upland and riparian habitat along Arroyo las Positas.	- Implement trail enhancement projects including construction of 0.8 miles of trail parallel to Arroyo las Positas, one pedestrian bridge across Arroyo Seco, and modification of I-580 pedestrian crossing at Las Colinas Road. Acquire 1.9 acres of land for trail. - Enhance 2.8 acres of riparian corridor by filling gaps in riparian vegetation using alkali plant elements in addition to classic riparian vegetation. Project includes acquisition of 2.8 acres for vegetation management. - Implement habitat enhancement projects including offline seasonal ponds to create habitat for the California red-legged frog and California tiger salamander. Specific measures will be implemented to limit mosquito breeding in seasonal ponds. Install fencing along project perimeter to exclude cattle from the 1-acre pond and improve success of restoration efforts. Acquire 1 acre of land for pond and buffer area. - Construct bio-technical bank stabilization utilizing methods such as live cribwalls, live fascines, brush mattresses, or joint plantings. Project includes acquisition of 1.7 acres of land for bank stabilization.	- Erosion and Sedimentation - Water Quality - Habitat and Environment - Trails, Recreation, and Public Education

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.1-6	Arroyo las Positas Multi-Purpose Project	To address in-stream and bank erosion along Arroyo las Positas. Create wetland to protect and enhance water quality, and habitat, and provide connectivity between existing trail sections along Arroyo las Positas.	- Stabilize channel banks by constructing bio-technical bank protection including dormant post plantings along Arroyo las Positas and constructing a grade control structure such as a rock vane at STA 330+00. - Construct 4,000 feet of multi-use trail along Arroyo las Positas from North Livermore Avenue to Las Colinas Road (proposed trail in R.1-6). The trail will include one road crossing at North Livermore Avenue. Project includes acquisition of 1.8 acres of land for trail. - Construct wetlands, including wetlands west of North Livermore Avenue (approximately 20 acres). Wetlands include land acquisition, excavation, and riparian plantings. - Construct interpretive kiosk and approximately 3,000 feet of boardwalk.	- Erosion and Sedimentation - Water Quality - Habitat and Environment - Trails, Recreation, and Public Education
R.1-7	Capacity Improvement at Arroyo las Positas	To increase the channel capacity of an undersized 500-foot reach of Arroyo las Positas so that it equals the capacity of the reach immediately west of Vasco Road. Link the existing trail along Lobelia Way to the trail running along the north bank of Arroyo las Positas, immediately west of Vasco Road.	- Widen channel of Arroyo las Positas (immediately west of Vasco Road). Acquire 0.11 acres of land for channel widening. Create 0.14 acres of wetlands as environmental mitigation for channel widening. - Repair a minor bank failure along the south bank of Arroyo las Positas. - Construct a 0.2 mile trail from Lobelia Way to the existing trail. Acquire 0.2 acres for trail. - Create off-line seasonal ponds to create habitat for the California red-legged frog and California tiger salamander. Limit mosquito breeding in seasonal ponds. Acquire 0.5 acres of land for pond and buffer area.	- Trails, Recreation, and Public Education - Flood Protection and Drainage

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
Reach 2				
R.2-1	Velocity Control Project	To implement flood protection along the realigned Arroyo las Positas, address in-stream and bank erosion due to high velocity flood flows, and create links to regional trails.	- Construct floodwall along the south bank of Realigned Arroyo las Positas. - Construct velocity/erosion control measures, including channel meander along the realigned Arroyo las Positas channel, reconfiguration of concrete weir stilling basin to provide better energy dissipation, and increased vegetation along the channel sloped and banks. - Establish 5,300 feet of trail on existing south maintenance road from Vasco Road to the confluence with Arroyo Seco to be linked to Regional Trails Project R.2-3.	- Flood Protection and Drainage - Erosion and Sedimentation - Water Quality - Habitat and Environment - Trails, Recreation, and Public Education
R.2-2	Arroyo Seco Improvements	To allow Arroyo Seco to convey 100-year flows at built-out conditions.	- Construct five floodwalls along the three bridges to provide adequate freeboard under built-out conditions. - Repair the existing levees along the east bank of Arroyo Seco. Repair work would be conducted along 500 feet of levees. - Perform limited plantings of native species to provide cover and shade through reach. Conduct vegetation planting along 1,400 feet of levee. - Construct bio-technical bank stabilization along 1,400 feet of stream on both banks. - Construct floodwall along Arroyo Seco.	- Flood Protection and Drainage - Habitat and Environment

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.2-3	Arroyo Seco Trail Project	To create a system of regional trails.	• Upgrade 6,000 feet of maintenance road to trail along Arroyo Seco. • Conduct bike trail touch-ups on existing bike trails along Arroyo Seco. • Construct a cantilever bridge to route the Arroyo Seco trail over the railroad tracks. • Install signs for safety at each side of the cantilever bridge. • Construct a cantilever bridge over the realigned Arroyo las Positas to tie-in to Arroyo Seco trail. • Acquire approximately 0.35 acres of land for bike trail touch-ups.	• Trails, Recreation, and Public Education
Reach 3				
R.3-1	South Bay Aqueduct Turnout Construction and Low Flow Crossings	To increase the groundwater recharge along Arroyo Mocho by • constructing a turnout to transfer water from the SBA. The project also includes • constructing two low-flow crossings along Arroyo Mocho.	• Construct SBA turnout • Replace existing low-flow crossing (residential driveway) at 3949 Mines Road with an elevated ford design crossing (approximately 100 feet by 12 feet in width) • Replace existing low-flow crossing (residential driveway) at 4351 Mines Road with an elevated ford design or clear span crossing (design and dimensions to be determined)	• Water Supply • Habitat and Environment

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.3-2	Robertson Park Enhancement and Levee Construction Project	To curtail erosion along Arroyo Mocho by implementing bank stabilization activities and to create wetlands to improve water quality and enhance critical habitat.	- Construct wetland with meandering channel, breeding habitat/pools, excavation to accommodate 100-year flood, downstream grade control, and native habitat - Manage vegetation including non-native plant removal and replacement with native varieties - Build levees along the north and south banks and dedicate approximately 35 acres of land within levees - Construct education center/in-door classroom - Construct wetland area boardwalk trail - Construct regional connector trail along Arroyo Mocho - Install biotechnical bank stabilization measures.	- Flood Protection and Drainage - Erosion and Sedimentation - Water Quality - Habitat and Environment - Trails, Recreation, and Public Education
R.3-3	Parks Floodplain Dedication and Levee Construction	To dedicate floodplain to attenuate 100-year flood flows at build-out and to protect existing development from a 100-year flood event.	- Dedicate floodplain as park/open space - Construct levees, including road rerouting and native species revegetation - Stabilize banks as needed from Arroyo Road to just upstream of Holmes Street	- Flood Protection and Drainage - Habitat and Environment - Trails, Recreation, and Public Education
R.3-4	Holmes Street Sedimentation Basin and Granada/Murrieta Protection and Enhancement	To curtail aggradation of Arroyo Mocho, to protect existing development from a 100-year flood event and to provide regional trail connectivity.	- Construct 1.9 AF sedimentation basin just upstream of Holmes Street. Create 0.9 acres of wetlands - Construct levees along channel banks, including trail route on levee. - Dedicate approximately 25 acres of land for levees. - Conduct riparian enhancement along both banks of Arroyo Mocho and along the levees - Remove Granada High School crossing	- Flood Protection and Drainage - Erosion and Sedimentation - Water Quality - Habitat and Environment - Trails, Recreation, and Public Education

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.3-5	Fish Barrier Removal at Stanley Boulevard and Railroad Overcrossing	To restore Arroyo Mocho as a fish migration corridor and to improve the riparian habitat along Arroyo Mocho.	• Modify railroad bridge footing to allow fish passage • Rehabilitate railroad bridge into trail • Conduct riparian enhancement along Arroyo Mocho banks	• Habitat and Environment • Recreation, Trails, and Public Education
Reach 4				
R.4-1	Sycamore Grove Recharge Bypass Project	To replace existing summer-time water releases from Del Valle Reservoir into Arroyo del Valle with releases from South Bay Aqueduct into South Tributary.	• Modify valving at treatment plant and transform into SBA turnout	• Water Supply • Habitat and Environment
R.4-2	Sycamore Grove Park Trail Connections	To create a system of regional trails by filling in regional trail corridor gaps.	• Link Sycamore Grove Park trail to EBRPD's trail, including an undercrossing and bike/pedestrian bridge with signage • Construct Sycamore Grove Park trail extension • Acquire approximately 1.5 acres of land for trail connection	• Recreation, Trails, and Public Education
Reach 5				
R.5-1	North of I-580 Trail System	To promote recreational corridors along Arroyo las Positas and create a regional trail system and create a system of regional trails	• Construct Cottonwood, Collier, and Cayetano trails. Acquire 30.3 acres of land for trails • Construct seasonal undercrossing at I-580 • Construct fencing to exclude cattle from the creeks.	• Trails, Recreation, and Public Education
R.5-2	Airway Improvement Project	To increase the reach capacity and curtail future aggradation by trapping sediment loads.	• Remove sediment at culverts in Kitty Hawk Road and along Airway Boulevard • Mitigate sediment removal (restoration) • Construct 2.8 acre-sediment basin • Construct levees (or construct floodplain terrace with bank stabilization) • Install shaded riverine aquatic cover	• Flood Protection and Drainage • Erosion and Sedimentation • Water Quality • Habitat and Environment • Recreation, Trails, and Public Education

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.5-3	Arroyo las Positas Diversion Project	To alleviate capacity deficiency at Arroyo las Positas through Las Positas Golf Course and protect adjacent property from potential flooding. To provide detention storage at Chain of Lakes.	- Construct a diversion channel for Arroyo las Positas flows, with a flow control structure, diversion/drainback channel, distribution channel, box culvert, drainback outlet, and land acquisition - Widen channel through the Golf Course by lowering channel invert, removing sediment, constructing 2.8 acre-sediment basin, and conducting mitigation on approximately 1.4 acres of land for sediment removal. - Widen channel downstream of the diversion by utilizing terracing to convey flows from the diversion structures - Create approximately 9 acres of wetland as mitigation.	- Flood Protection and Drainage - Erosion and Sedimentation - Water Supply
Reach 6				
R.6-1	Arroyo Mocho Management Plan	To protect and enhance stream habitat and improve riparian habitat. Also, to create a recreational corridor linked to the regional trail system.	- Extend vegetation management to create meandering channel and increase riparian vegetation - Modify existing fish barriers to make the streams fish-friendly - Construct trail linked to regional trails - Construct interpretive kiosk	- Flood Protection and Drainage - Water Quality - Habitat and Environment - Trails, Recreation, and Public Education
R.6-2	Arroyo Mocho Bypass and Regional Storage at Chain of Lakes	To alleviate flooding along Arroyo Mocho, and to provide regional storage and reduce downstream flooding along ADLL.	- Construct Arroyo Mocho Bypass, including overflow structure, new channel, and required land acquisition - Construct stormwater return from Cope Lake and Lake G, including outlet works, engine driven mobile pump system, and widening of Arroyo Mocho downstream of Cope Lake - Construct multipurpose trail along Arroyo Mocho bypass and along the road	- Flood Protection and Drainage - Water Supply - Water Quality - Recreation, Trails, and Public Education
Reach 7				

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.7-1	Upper Chain of Lakes Trail Network	To construct a recreational trail network around Lakes A and B that will be linked to existing trails.	- Construct a trail network around Lakes A and B, including pedestrian bridges and signaled crossings - Acquire approximately 5 acres of land	Recreation, Trails, and Public Education
R.7-2	EBRPD Trail Connections	To create a system of regional trails and link EBRPD trail segments.	Construct new trail to connect existing trail segments	Recreation, Trails, and Public Education
R.7-3	Lower Arroyo del Valle Restoration and Enhancement Project	To improve fisheries habitat and create a system of trails.	- Construct trails, develop a trail maintenance plan, install pedestrian and bike signaled crossings, construct a pedestrian and bike overcrossing, and acquire 0.9 acres of land. - Remove three fish barriers and replace a drop structure - Repair and modify flap gates - Fill and replant riparian gaps and remove non-native species	- Flood Protection and Drainage - Habitat and Environment - Recreation, Trails, and Public Education
Reach 8				
R.8-1	Tassajara Creek Improvement Project	To alleviate capacity problems in the lower reach of Arroyo Mocho and promote regional trail and connectivity.	- Extend trail along Tassajara Creek - Construct a sediment basin - Construct undercrossing to allow for seasonal passage under I-580 - Stabilize each bank as needed from I-580 to confluence with Arroyo Mocho	- Flood Protection and Drainage - Erosion and Sedimentation - Water Quality - Recreation, Trails, and Public Education
R.8-2	Chabot Canal Improvement Project	To increase flood control capacity of Chabot Canal to convey 100-year storm flows and extend the regional trail system.	- Construct additional box culverts at five crossings - Lower and pave levee maintenance road - Open a maintenance road for use as a multi-purpose trail - Clean, widen, and concrete line Chabot Canal upstream of I-580 - Create 5.4 acres of wetlands	- Flood Protection and Drainage - Trails, Recreation, and Public Education

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.8-3	Lower Arroyo Mocho Improvement Project	To curtail aggradation of Arroyo Mocho and enhance in-stream aquatic habitat for steelhead.	• Improve channel by removing drop structure and replacing with an alternative grade control structure, removing sediment, installing aquatic cover, creating a low-flow channel, and constructing bio-technical bank stabilization measures • Construct a new flood wall • Create 8.2 acres of wetlands as mitigation for sediment removal	• Flood Protection and Drainage • Erosion and Sedimentation • Water Quality • Habitat and Environment • Trails, Recreation, and Public Education
R.8-4	Upper ADLL Improvement Project	To restore reach capacity and to protect properties from a 100-year flood event; to enhance the in-stream aquatic habitat and restore steelhead passage; and to provide a recreational corridor with interpretive features.	• Improve channel by removing sediment, creating low-flow channel, installing bank stabilization measures and grade control structure, lowering maintenance road, and providing shaded riverine cover • Build new flood wall along Valley Trails • Construct new flood wall along Pleasanton Canal • Install drainage pump in Valley Trails neighborhood • Construct 2 interpretive kiosks • Create 9.2 acres of wetland for mitigation for sediment removal	• Flood Protection and Drainage • Erosion and Sedimentation • Water Quality • Habitat and Environment • Trails, Recreation, and Public Education
Reach 9				
R.9-1	Alamo Canal/South San Ramon Creek Erosion Control	To stabilize Alamo Canal and South San Ramon Creek banks in order to decrease sediment load and curtail aggradation along the lower reaches of Alamo Canal.	• Stabilize the Alamo Canal and South San Ramon Creek banks using bio- and geo-technical bank stabilization methods • Provide shaded riverine aquatic cover and habitat enhancement along the channel	• Erosion and Sedimentation • Water Quality • Habitat and Environment
R.9-2	Line F-4 Concrete Lining	To stabilize banks currently backing adjacent residences' properties and arrest further property loss.	• Concrete line channel. • Create 3.7 acres of wetland as mitigation for concrete lining	• Erosion and Sedimentation

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.9-3	Line J-1, J-3, and J-5 Improvements	To increase channel capacity and to address undersized culverts, thereby reducing flooding.	• Concrete line channel, including bottom and banks. Create 1.9 acres of wetlands as mitigation. • Retrofit culverts	• Flood Protection and Drainage • Erosion and Sedimentation
R.9-4	Line T Crossing Evaluation	To protect properties adjacent to Dublin Canyon Road bridge from flooding	• Retrofit Dublin Canyon Boulevard culvert by increasing culvert capacity, and building floodwalls • Retrofit Donlon Way culvert by increasing culvert capacity and building floodwalls.	• Flood Protection and Drainage
R.9-5	I-580 Trail Gap Elimination	To close a gap in the regional trail system, linking trails south and north of I-580.	• Excavate notch on east side of I-580 bridge • Install retaining wall • Develop trail surface under bridge	• Trails, Recreation, and Public Education
R.9-6	Line G-1-1 Maintenance Plan	To eliminate mosquito breeding in stagnant pools and to repair minor bank failures.	• Create low flow channel • Repair bank failures • Remove sediment • Create 0.3 acres of wetlands as sediment removal mitigation	• Erosion and Sedimentation • Water Quality • Habitat and Environment
R.9-7	Alamo Creek Flood Control Program	To restore capacity of Alamo Canal for 100-year flood flows and lower an existing maintenance road.	• Remove sediment • Lower maintenance road • Revegetate along excavated bank • Construct biotechnical bank stabilization • Create 7.8 acres of wetlands as sediment removal mitigation	• Flood Protection and Drainage • Erosion and Sedimentation • Water Quality • Habitat and Environment

Reach 10

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

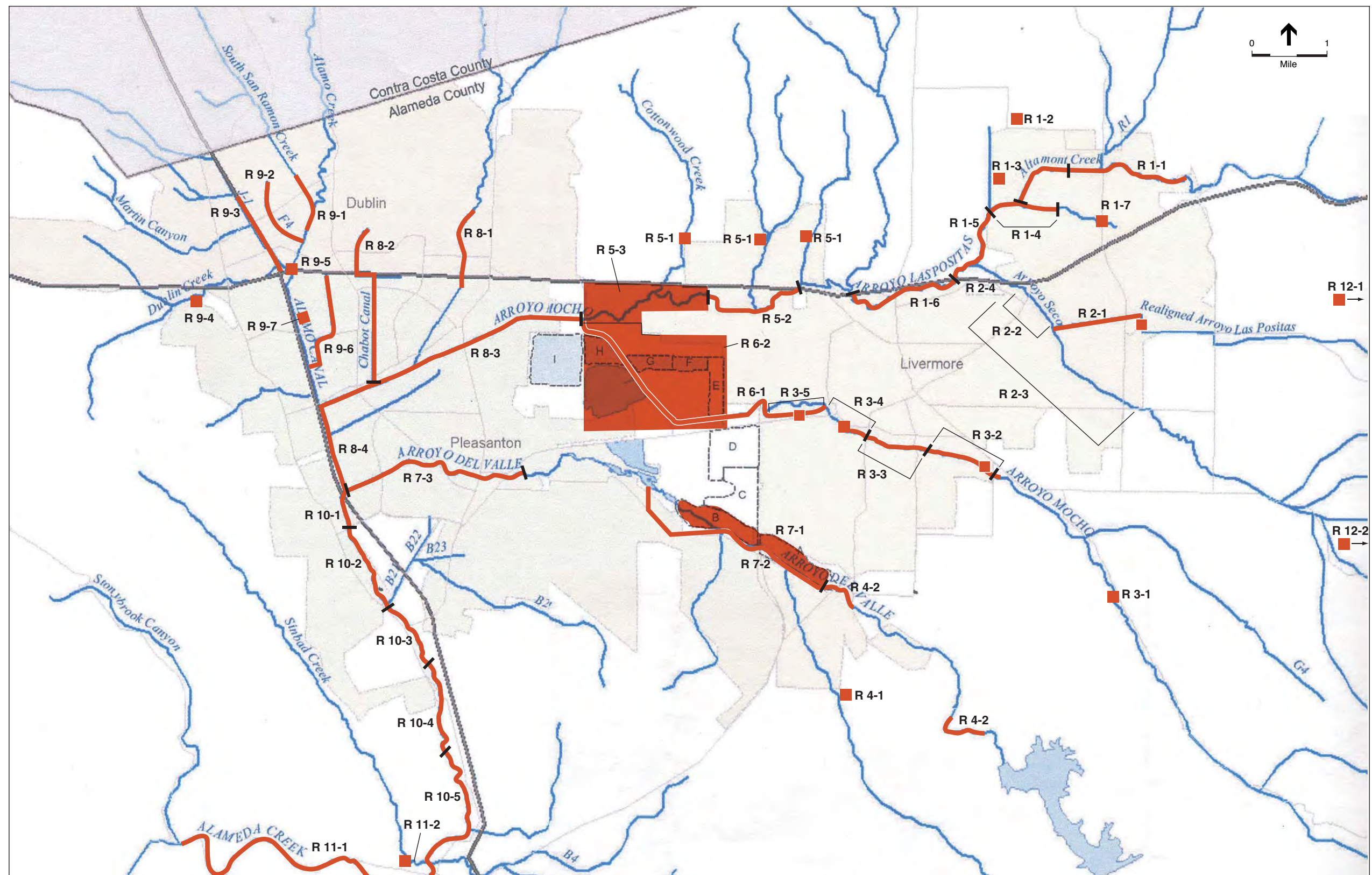
Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.10-1	Upper ADLL Improvement Project 1	To stabilize banks along the upper reach of ADLL, enhance riparian corridor, and create a recreational corridor.	• Upgrade maintenance road for trail access. Install signage. • Construct pedestrian/maintenance bridge (trail link) • Stabilize channel by constructing in-stream bank protection devices, using biotechnical measures, and by installing one grade control structure. • Enhance riparian corridor	• Erosion and Sedimentation • Water Quality • Habitat and Environment • Trails, Recreation, and Public Education
R.10-2	Upper ADLL Improvement Project 2	To enhance stream habitat and environmental features for steelhead, stabilize banks, and create a recreational corridor.	• Replace the existing storm water drainage outfall • Remove concrete structure and replace with drop structure, apron, or riprap • Install interpretive kiosk • Stabilize bank using bio-technical techniques • Construct trail along Bernal property • Construct pedestrian bridge over Line B21 • Create vegetated bank terrace • Acquire 2.4 acres along 1 mile of stream for trail	• Flood Protection and Drainage • Erosion and Sedimentation • Water Quality • Habitat and Environment • Recreation, Trails, and Public Education
R.10-3	ADLL Improvement Project 3	To improve potential fisheries corridor in ADLL, stabilize banks, and extend the recreational corridor.	• Replace drop structure • Restore riprap. Acquire 5.5 acres on each bank. • Open maintenance road for public access • Acquire 1.1 acres for trail	• Flood Protection and Drainage • Erosion and Sedimentation • Water Quality • Habitat and Environment • Trails, Recreation, and Public Education

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.10-4	ADLL Improvement Project 4	To stabilize the bed and banks along the middle reach of ADLL, enhance the riparian corridor, and continue the recreational corridor.	• Conduct bank restoration activities • Extend trail south of golf course. Acquire 2.1 acres of railroad easement • Install signage for pedestrian crossing • Construct bank stabilization demonstration project. Acquire 1.15 acres of land. • Construct a grade control structure • Construct an interpretive kiosk	• Flood Protection and Drainage • Erosion and Sedimentation • Water Quality • Habitat and Environment • Trails, Recreation, and Public Education
R.10-5	ADLL Improvement Project 5	To protect properties from 100-year flood event, reduce erosion and improve riparian habitat, and continue the recreational corridor.	• Preserve existing floodplain on SFPUC property • Create trail along ADLL. Acquire 4.8 acres • Replace drop structures with alternative grade control structures • Remove log jam • Install in-stream bank protection devices • Reduce sharp meander by establishing new flow paths • Implement vegetation management and riparian enhancement • Implement land acquisition • Build levee	• Flood Protection and Drainage • Erosion and Sedimentation • Water Quality • Habitat and Environment • Trails, Recreation, and Public Education
Reach 11				
R.11-1	Alameda Creek Trail	To create a system of regional trails.	• Construct connector trail along Alameda Creek. Acquire 5.8 acres of land for trail.	• Trails, Recreation, and Public Education

TABLE 2-4 (Continued)
DESCRIPTION OF SMMP PROJECTS

Reach/ Project No.	Project Name	Purpose	Project Components	Project Goals
R.11-2	Sinbad Creek Project	To stabilize bank and encourage community participation in creek stewardship.	• Establish volunteer "Adopt-a-Creek" program and install "no dumping" signage • Conduct localized erosion control, place boulders along toe of bank, revegetate bank, and acquire 0.055 acre for bank stabilization. • Conduct trash removal.	• Erosion and Sedimentation • Trails, Recreation, and Public Education • Water Quality
Reach 12				
R.12-1	Patterson Run Enhancement Program	To stabilize creek banks, encourage creek stewardship, and encourage use of Best Management Practices.	• Establish volunteer "Adopt-a-Creek" program and install "no dumping" signage. • Stabilize channel banks by grading and revegetating. • Conduct trash removal.	• Erosion and Sedimentation • Water Quality • Trails, Recreation, and Public Education
R.12-2	Coral Hollow Creek Landowner Grant Program	To reduce property loss and downstream sedimentation and encourage community participation in creek stewardship.	• Conduct localized bank stabilization activities. Acquire 0.9 acres • Establish volunteer "Adopt-a-Creek" program	• Erosion and Sedimentation • Water Quality • Trails, Recreation, and Public Education

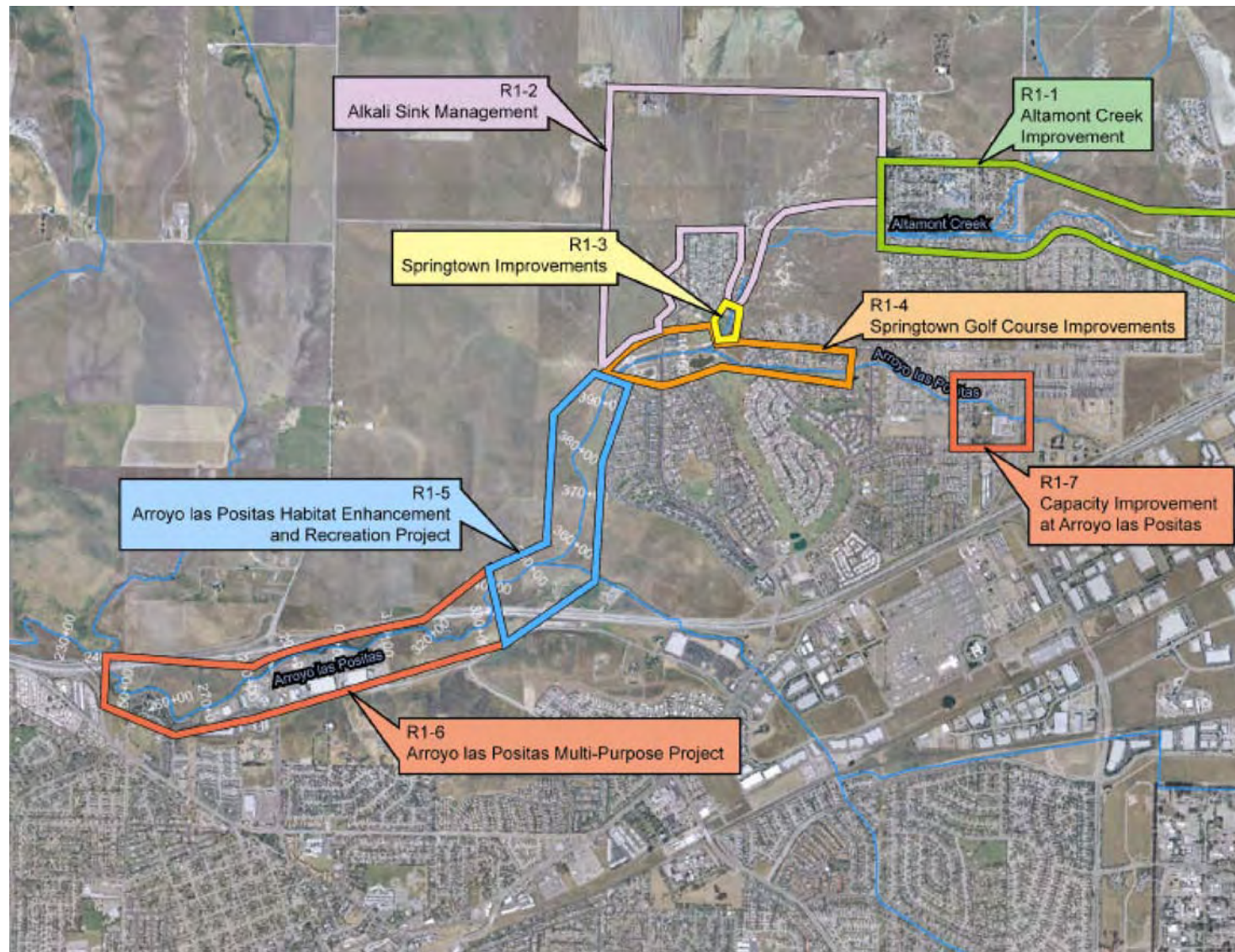


SOURCE: RMC, 2004

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Figure 2-5
SMMP Project Locations by Project Type

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Reach 1 also includes Springtown Improvements Phase I and II (R.1-3 and R.1-4). Critical habitat for special-status species, as noted above, would be enhanced in Phase I. In-stream aquatic habitat would be enhanced by creating a low-flow meandering channel. This project also includes creation of a regional trails system. Phase II would focus on sediment trapping along Altamont Creek. Implementation of the Arroyo las Positas Multi-Purpose Project (R.1-7) would begin to reverse the effects of in-stream and bank erosion along Arroyo las Positas. Wetlands would be created to improve water quality and habitat and trails would be constructed along the stream to enhance connectivity for recreation.

Reach 2 Projects

The location of the three projects included in Reach 2 is demonstrated on **Figure 2-7** and a complete description of each project is included in **Appendix 2.0**. Reach 2 includes the Velocity Control Project (R.2-1) which would address high velocity flood flows that cause significant erosion along Realigned Arroyo las Positas. This project would increase the capacity of the channel to convey 100-year flood flows. This project also includes provision of channel meander and increased vegetation. Trails would be built along the reconfigured channel.

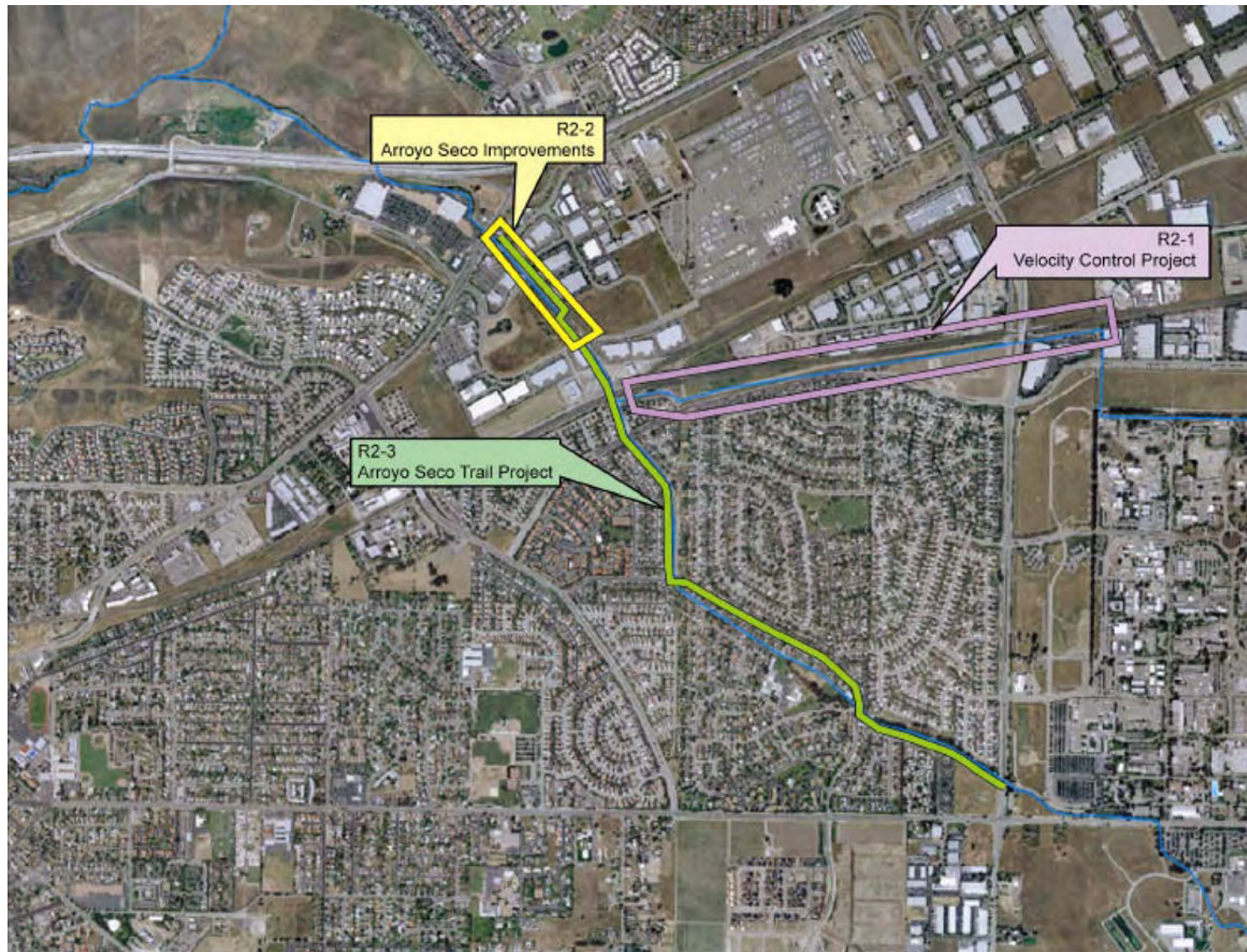
Reach 2 also includes the Arroyo Seco Improvements (R.2-2), which would protect adjacent properties from flooding during a 100-year event at build out. The project includes modifications to three bridges and levee improvements to increase the height of the freeboard and habitat enhancements through native planting. In addition, a system of regional trails is proposed in the Arroyo Seco Trails Project (R.2-3) by the conversion of existing maintenance roads to multi-use trails and construction of a new bike trail. Adjacent properties would be protected from flooding through these capacity improvements. The project includes maintenance road improvements and native planting. In addition, the existing maintenance road would be improved to a trail.

Reach 3 Projects

The location of the five projects included in Reach 3 is demonstrated on **Figure 2-8** and a complete description of each project is included in **Appendix 2.0**. Reach 3 includes the South Bay Aqueduct Turnout Construction and Low Flow Crossings Project (R.3-1) which would increase groundwater recharge ability of Arroyo Mocho by the addition of a turnout from the SBA that increases the flow in Arroyo Mocho downstream of its confluence with the aqueduct. In addition, an educational kiosk would also be constructed as part of this project. The project also includes construction of two low-flow crossings along Arroyo Mocho.

As a part of Robertson Park Enhancement and Levee Construction Project (Project R.3-2), bank stabilization activities would be implemented along Arroyo Mocho to curtail erosion and wetlands would be created to improve water quality and enhance critical habitat. Levees would be built along the north and south banks and 35 acres of land would be dedicated within levees.

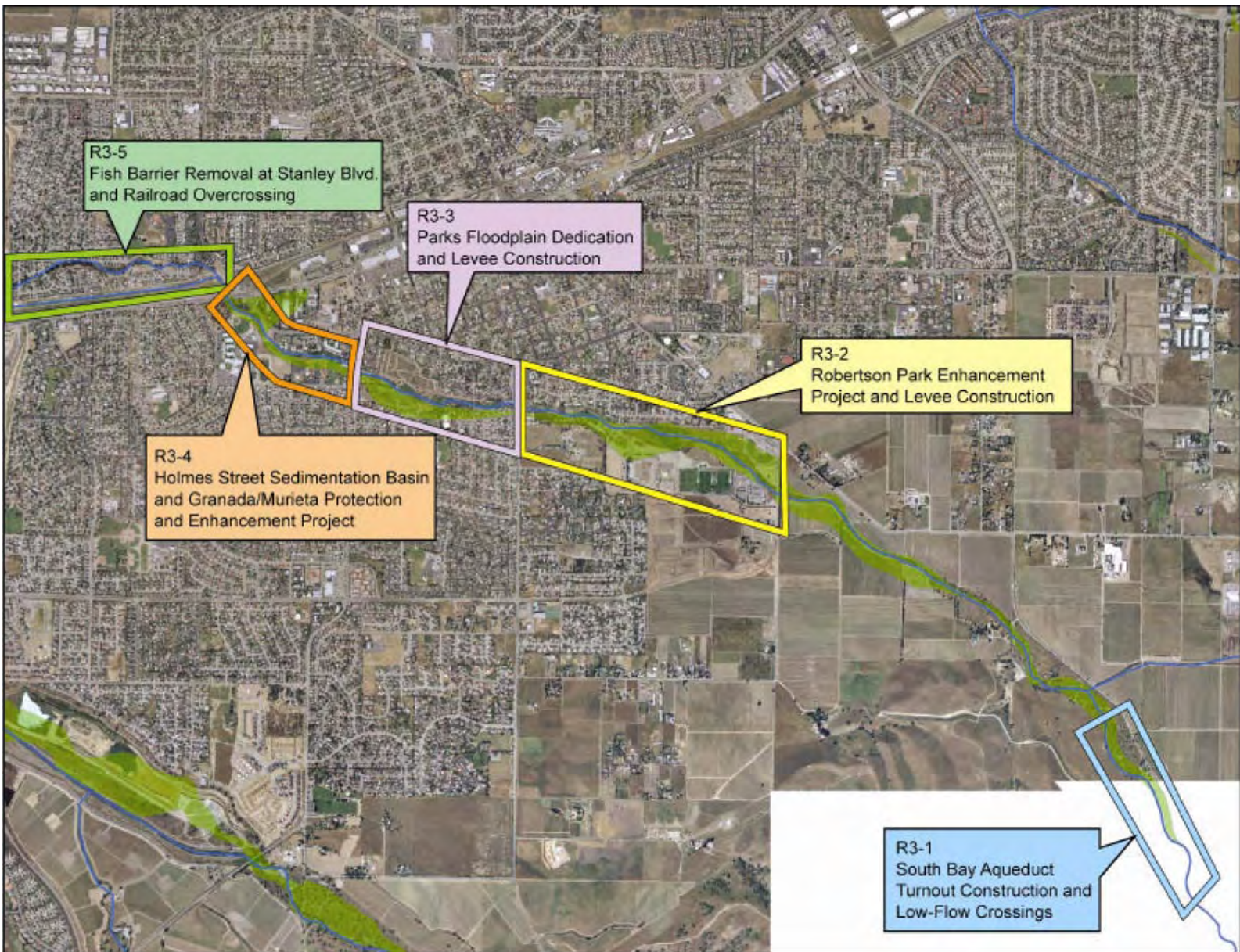
Under the Parks Floodplain Dedication and Levee Construction project (R.3-3), the floodplain would be preserved to minimize potential damage to adjacent properties from 100-year flows. Approximately 36 acres of parks and open space would be dedicated adjacent to Arroyo Mocho



SOURCE: RMC, 2005

Zone 7 SMMP . 203485

Figure 2-7
SMMP Reach 2 Projects



SOURCE: RMC, 2005

Zone 7 SMMP . 203485

Figure 2-8
SMMP Reach 3 Projects

in order to prevent future flood damage to developable areas within the floodplain. Additionally, levees would be constructed to protect currently developed properties. The project also includes roadway rerouting, biotechnical bank stabilization measures, levee construction, and revegetation.

Arroyo Mocho is potentially a critical stream for steelhead migration. The Fish Barrier Removal at Stanley Boulevard and Railroad Overcrossing project (R.3-5) would remove a barrier to fish passage at the abandoned railroad right-of-way crossing near Stanley Boulevard. Modifications would be made to improve the Iron Horse trail for use, thereby improving regional trail connectivity.

Reach 4 Projects

The location of the two projects included in Reach 4 is demonstrated on **Figure 2-9** and a complete description of each project is included in **Appendix 2.0**. Reach 4 includes the Sycamore Grove Recharge Bypass Project (R.4-1), which would facilitate the replacement of summer-time water releases from Del Valle Reservoir into Arroyo del Valle with releases from the SBA into the South Tributary if appropriate. This water is for the purpose of groundwater recharge.

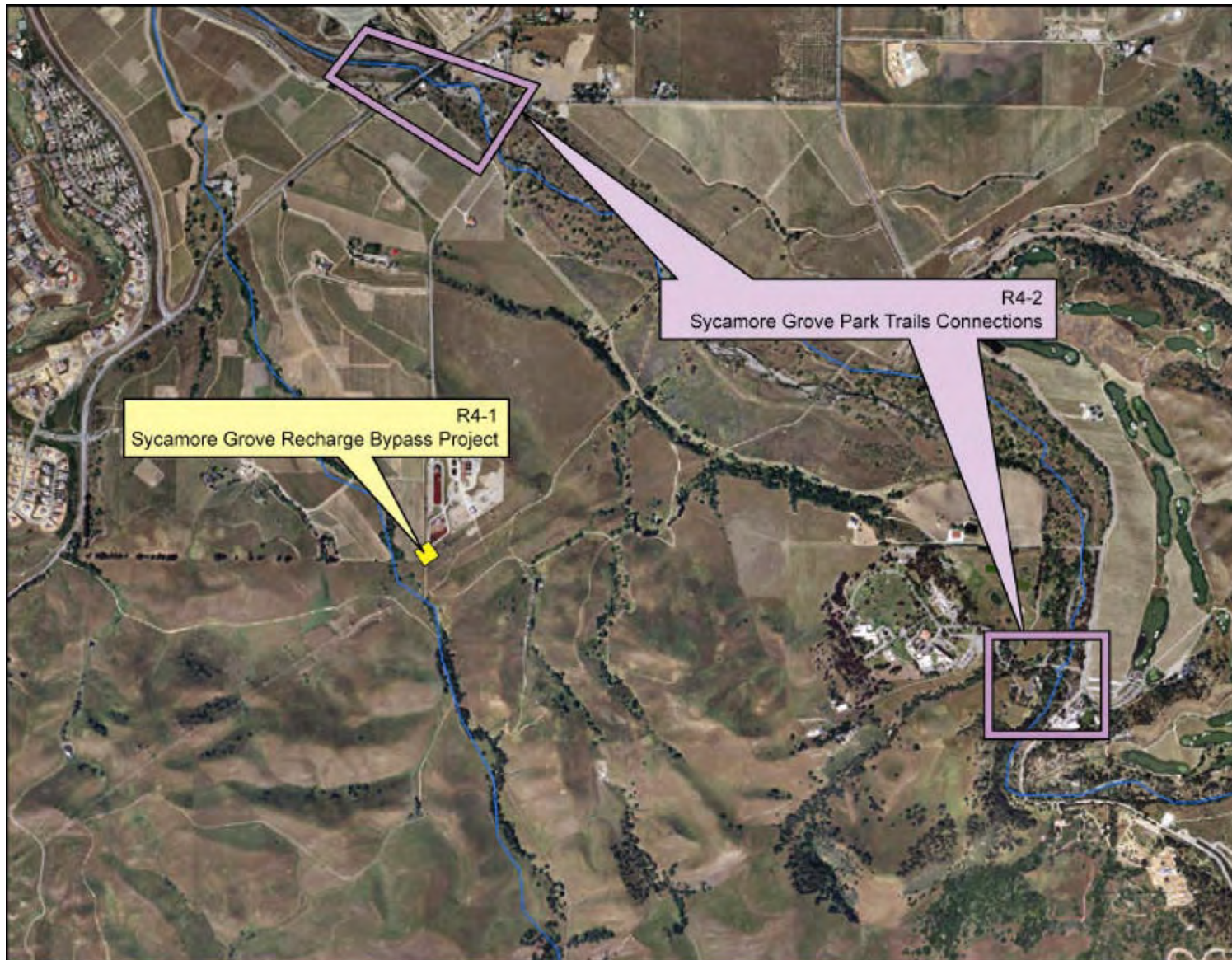
Reach 5 Projects

The location of the three projects included in Reach 5 is shown on **Figure 2-10** and a complete description of each project is included in **Appendix 2.0**. Limited capacity is a particular problem in Arroyo las Positas upstream of the Las Positas Golf Course. Construction of a sediment basin under the Airway Improvement Project (R.5-2) would alleviate the sediment loading along this stretch of stream.

Reach 5 also includes the Arroyo las Positas Diversion project (R.5-3) which would increase channel capacity downstream of Las Positas Golf Course. The diversion channel extends to Lake G and Cope Lake. The project will also include improvements of Arroyo las Positas downstream of the golf course to the confluence with Arroyo Mocho. The improvements will consist of terracing to provide additional capacity and revegetation activities. The project would include widening of the Arroyo las Positas channel and removing sediment. New wetlands would be created as a mitigation. The project would provide detention storage at Chain of Lakes as part of flood protection.

Reach 6 Projects

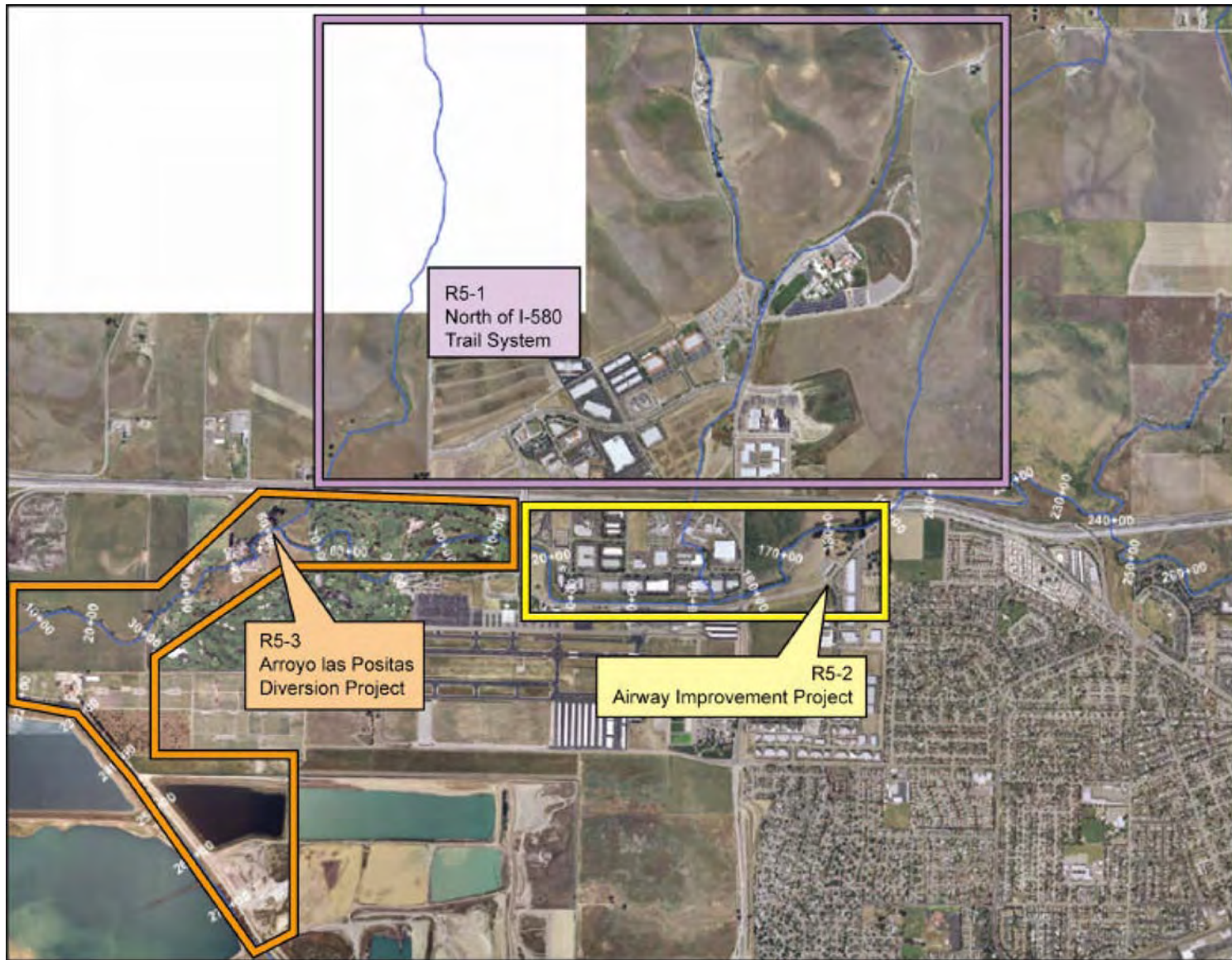
The location of the two projects included in Reach 6 is demonstrated on **Figure 2-11** and a complete description of each project is included in **Appendix 2.0**. The Arroyo Mocho Bypass and Regional Storage at Chain of Lakes project (R.6-2) would divert and detain flows in Arroyo Mocho to the Chain of Lakes. This would also increase opportunities for regional storage and reduce the downstream flooding potential in Arroyo de la Laguna. The project has two main features, the Arroyo Mocho Bypass (including Arroyo Mocho Stormwater Diversion Structure)



SOURCE: RMC, 2005

Zone 7 SMMP . 203485

Figure 2-9
SMMP Reach 4 Projects



SOURCE: RMC, 2005

Zone 7 SMMP . 203485
Figure 2-10
 SMMP Reach 5 Projects



SOURCE: RMC, 2005

and Stormwater Return from Cope Lake and Lake G. The project would also include construction of multipurpose trail along Arroyo Mocho bypass and along the road.

Reach 7 Projects

The location of the three projects included in Reach 7 is demonstrated on **Figure 2-12** and a complete description of each project is included in **Appendix 2.0**. Reach 7 projects include components similar to those found in other reaches, such as projects that contribute to trail connectivity, groundwater recharge, water conveyance, fish passage, and habitat enhancement.

Reach 8 Projects

The location of the four projects included in Reach 8 is demonstrated on **Figure 2-13** and a complete description of each project is included in **Appendix 2.0**. Reach 8 includes the Chabot Canal Improvement Project (R.8-2), which would increase the canal capacity to convey 100-year flood flows. Additionally a maintenance road would be opened to use as a multi-purpose trail.

Heavy sediment deposition and bank toe erosion has occurred in Reach 8. Removal of sediment and bank stabilization under the Upper ADLL Improvement Project (R.8-4) would help address these issues. Improvements to steelhead habitat and recreational opportunities would also be addressed in this project.

Reach 9 Projects

The location of the seven projects included in Reach 9 is demonstrated on **Figure 2-14** and a complete description of each project is included in **Appendix 2.0**. Reach 9 includes the Line T Crossing Evaluation (R.9-4), which would increase the culvert capacity and improve the capacity of Dublin Canyon Road Bridge and Donlan Way Crossing to convey storm flows. By increasing the bridge capacities, adjacent properties would be protected from potential flood damage. This project would also include a culvert retrofit.

The Line G-1-1 channel invert elevation is below the groundwater table in some parts, which has produced low-flow stagnant mosquito breeding areas. By modifying the channel under the Line G-1-1 Maintenance Plan (R.9-6) to produce a higher-flow situation, these problems could be decreased. Insect breeding would be minimized, as would downstream sedimentation.

Reach 10 Projects

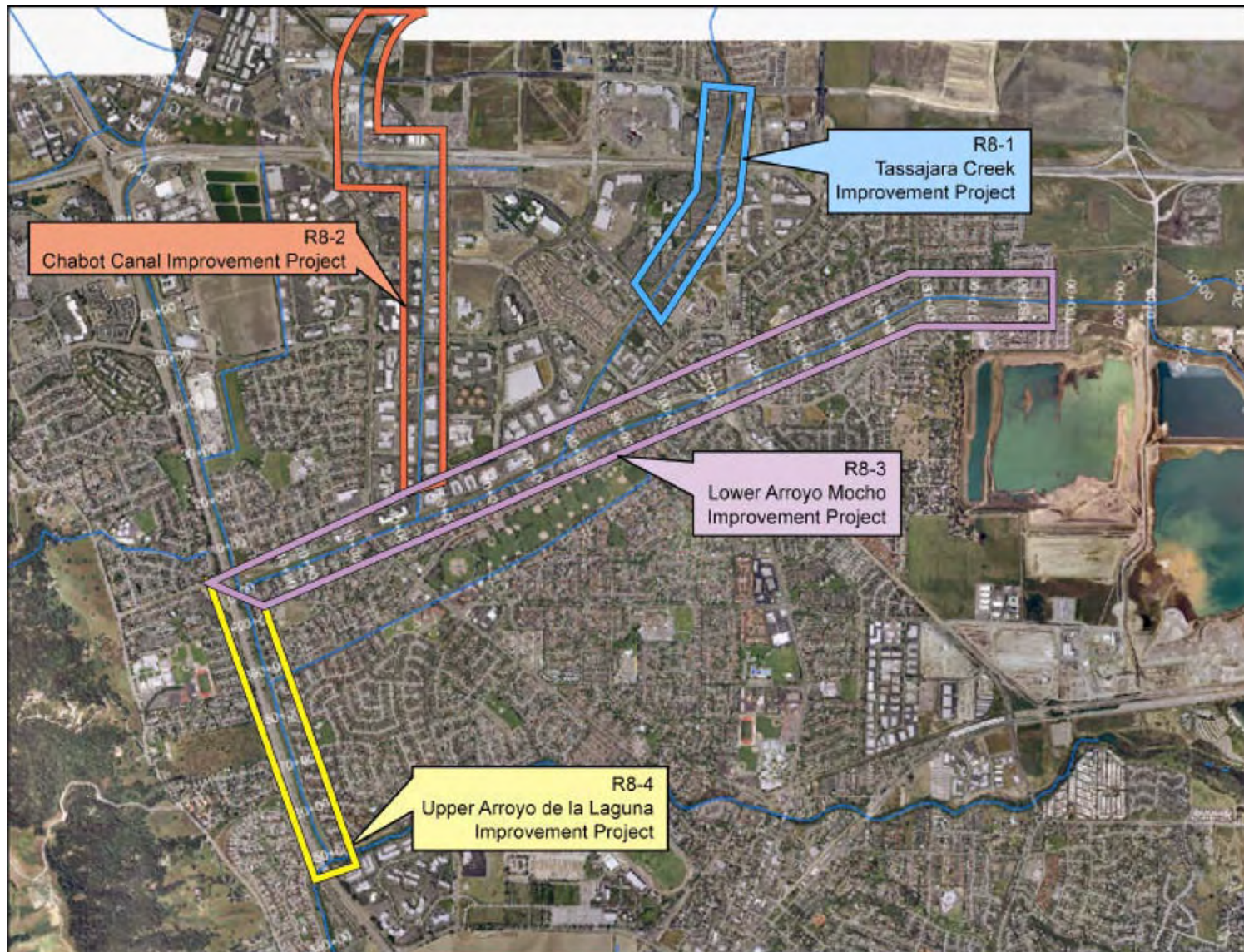
The location of the five projects included in Reach 10 is demonstrated on **Figure 2-15** and a complete description of each project is included in **Appendix 2.0**. The ADLL Improvement Project R.10-3 would remove various barriers to fish passage in ADLL along Castlewood Golf Course, resulting in improved steelhead habitat. Various projects in this reach address the significant bank erosion occurring along ADLL, while restoring and enhancing the stream, riparian, and recreation corridors. Flood protection and drainage improvements also are addressed in the projects on Reach 10.



SOURCE: RMC, 2005

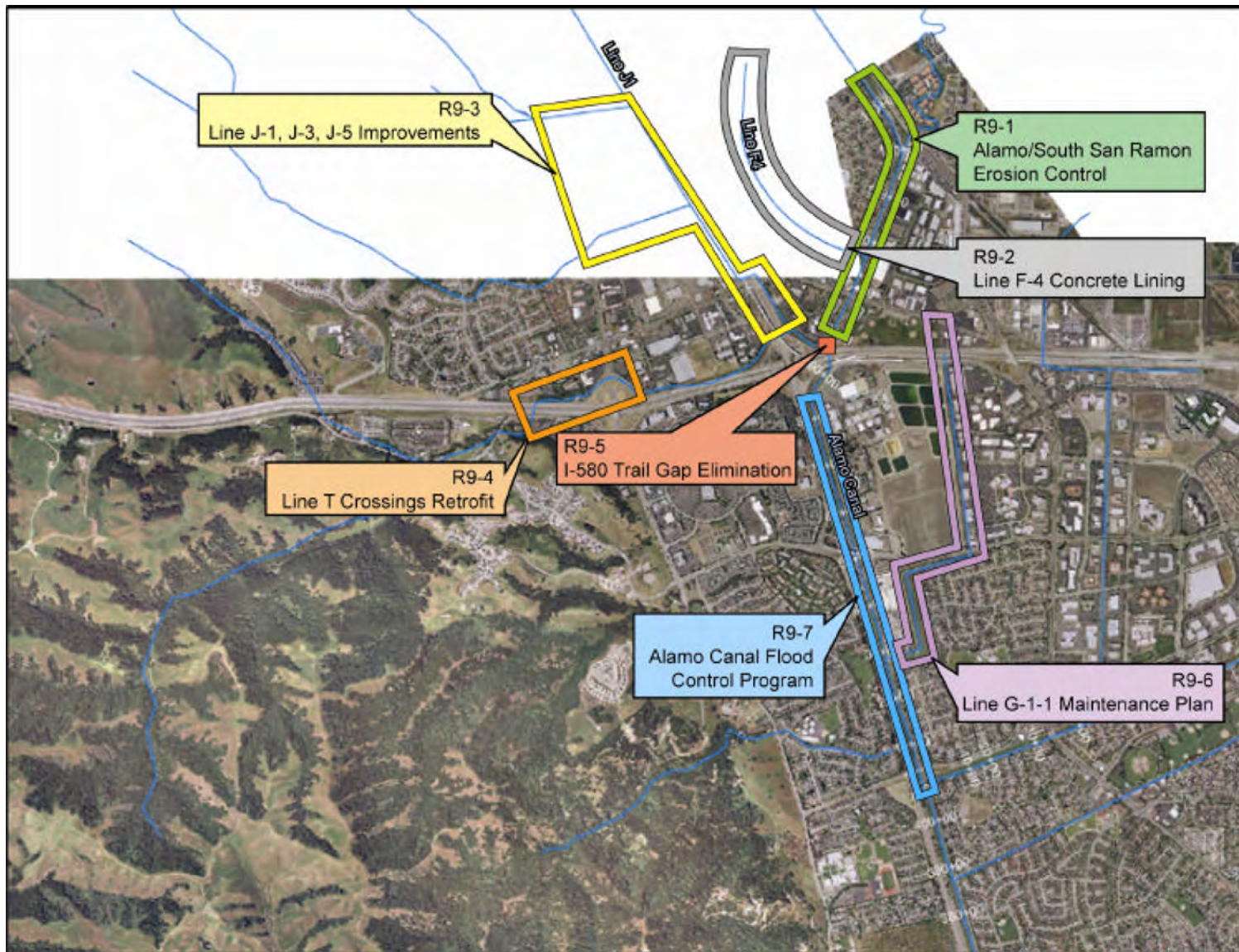
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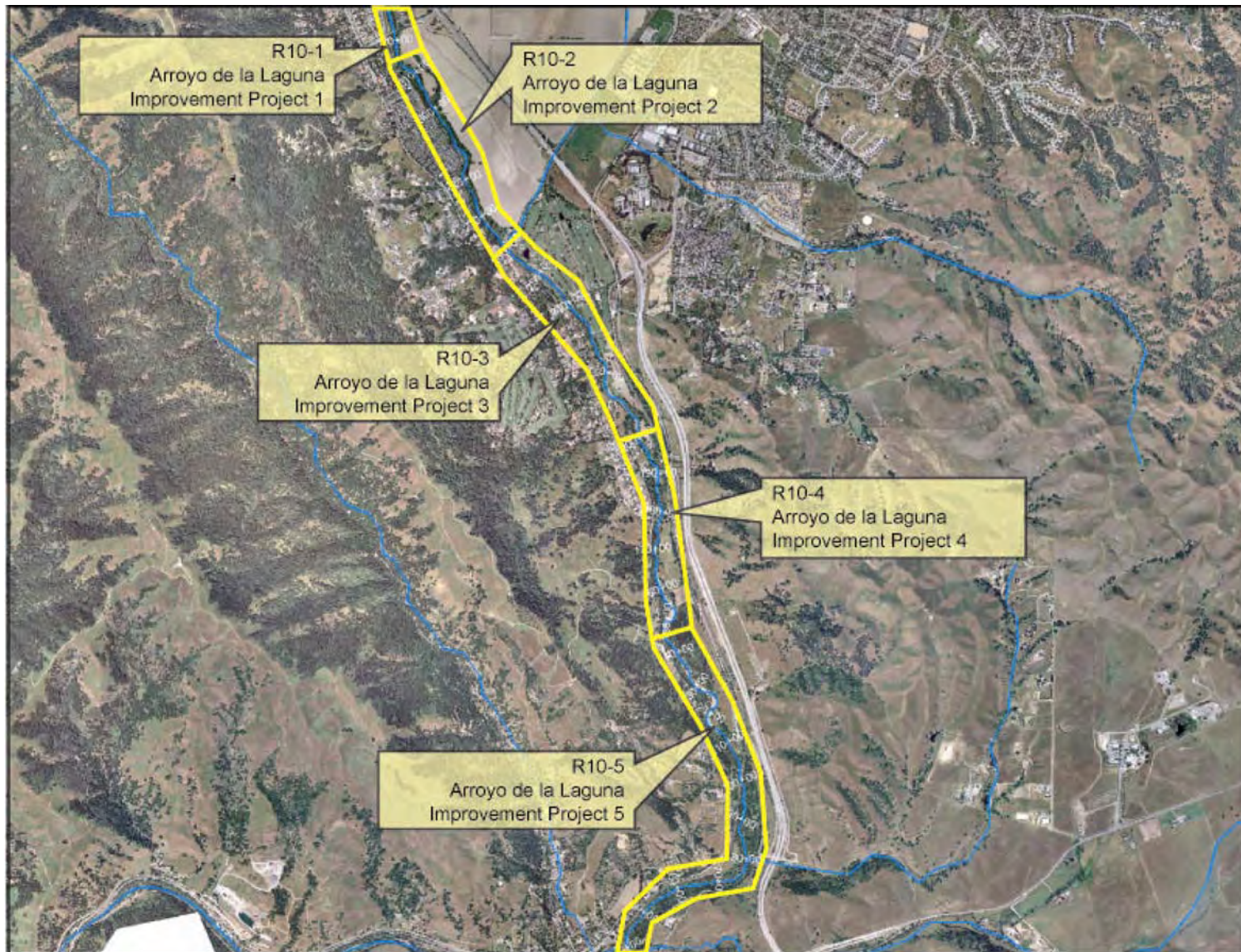
Figure 2-12
SMMP Reach 7 Projects



SOURCE: RMC, 2005

Zone 7 SMMP . 203485
Figure 2-13
SMMP Reach 8 Projects





SOURCE: RMC, 2005

Zone 7 SMMP . 203485

Figure 2-15
SMMP Reach 10 Projects

Reach 11 Projects

The location of the two projects included in Reach 11 is demonstrated on **Figure 2-16** and a complete description of each project is included in Appendix 2.0. Within Reach 11, bank stabilization is a problem along Sinbad Creek where it confluences with ADLL. The Sinbad Creek Project (R.11-2) project implements erosion control along this stretch. Additionally, this project would promote community participation in an “Adopt-a-Creek” program in the area.

Reach 12 Projects

The location of the two projects included in Reach 12 is demonstrated on **Figure 2-17** and a complete description of each project is included in Appendix 2.0. Within Reach 12, the Landowner Grant Program (R.12-2) would function as a grant to a particular landowner for bank stabilization and revegetation on their property along Corral Hollow Creek, thereby promoting community involvement in creek stewardship and erosion control.

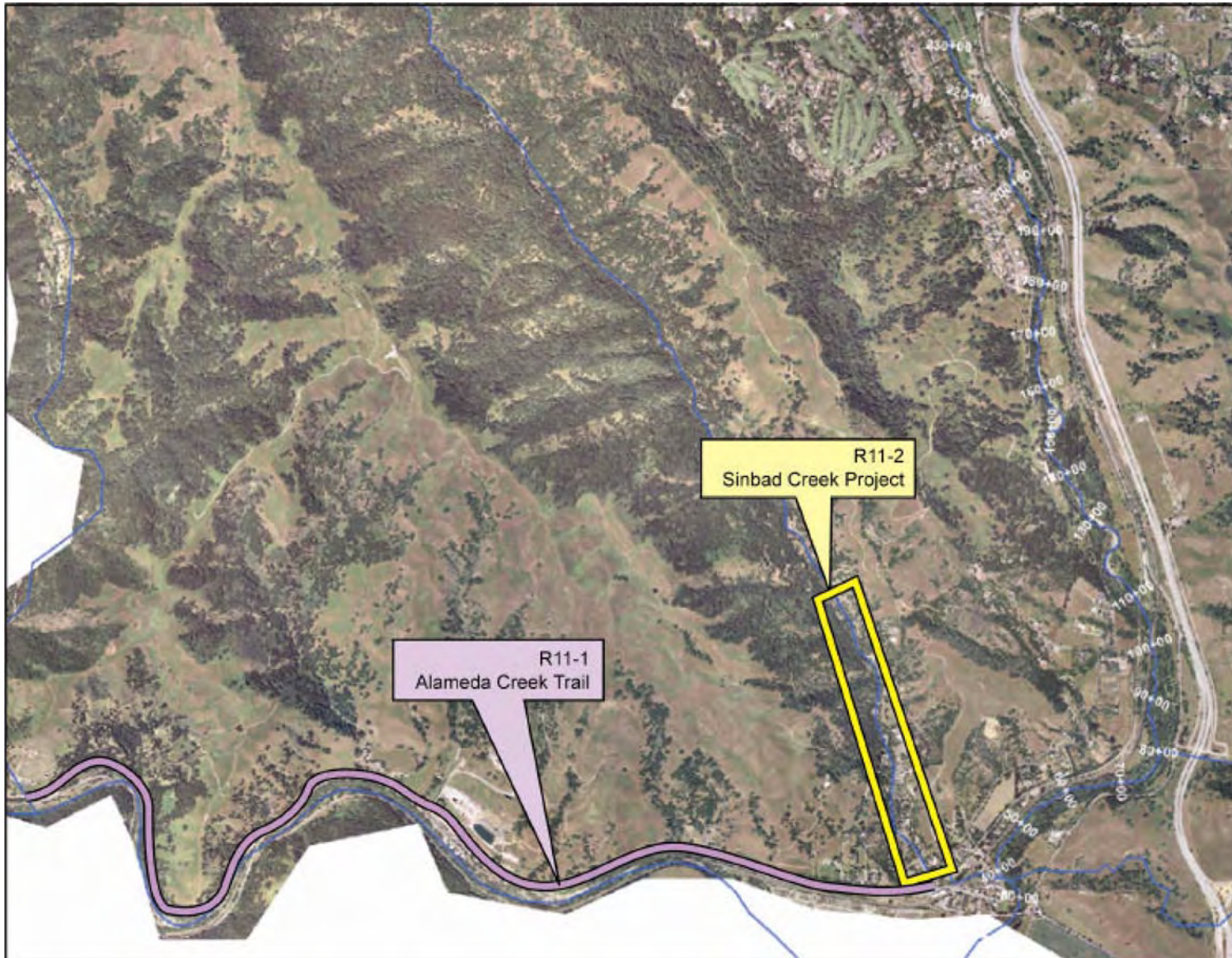
Flow Diversion and Chain of Lakes Detention Storage

The Chain of Lakes area has been identified as an integral part of the regional solution for flood protection in the Livermore-Amador Valley (see **Figure 2-18**). Flow diversion from Arroyo las Positas and Arroyo Mocho into detention storage in Cope Lake and Lake G would reduce downstream peak flows to acceptable levels as stated (i.e., flows that could be conveyed in a 100-year storm event, utilizing the available capacities of Arroyo Mocho and ADLL).

Under the SMMP, the frequency of diversion into Cope Lake and Lake G storage would be based on the peak flow in Arroyo Mocho downstream of the Chain of Lakes and resulting peak flows in ADLL at Bernal Avenue. To maintain, but not exceed peak flow in ADLL at its current capacity, detention storage or temporary storage in the Chain of Lakes would be required if flows in Arroyo Mocho immediately downstream of its confluence with Arroyo las Positas are 2,000 to 5,000 cubic feet per second (cfs) or greater. This flow corresponds to a rainfall event occurring once in every 6 or 7 years.

Flow diversions from the existing Arroyo Mocho, upstream of the Chain of Lakes, would occur more frequently (approximately after every 5-year rainfall event), due to the capacity limitations in Arroyo Mocho through the Chain of Lakes area. This diverted flow would either be transported to the confluence via Arroyo las Positas, downstream of the Chain of Lakes, or into detention storage in Cope Lake or other up-chain lakes if flows in Arroyo Mocho downstream of its confluence with Arroyo las Positas are 2,000 to 5,000 cfs or greater.

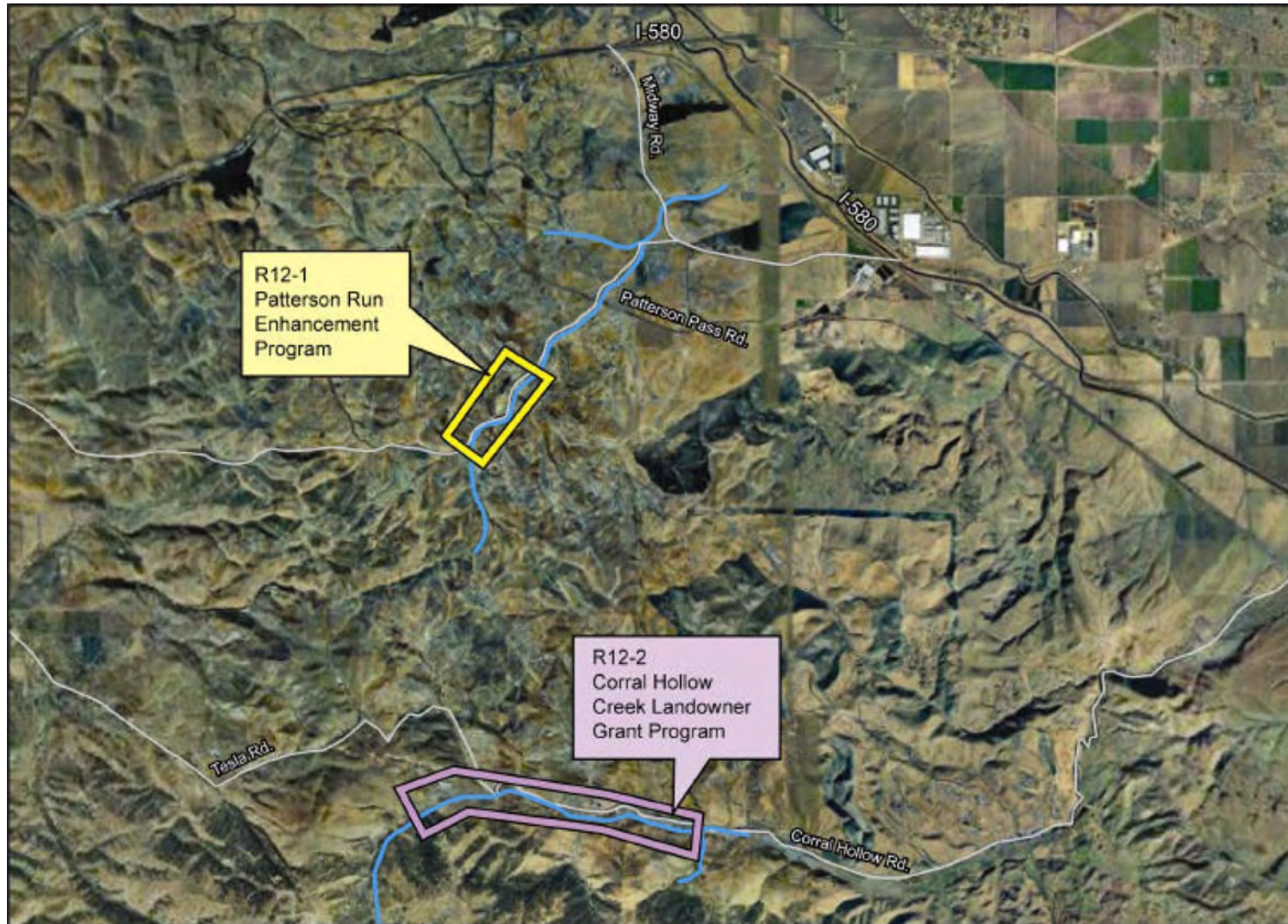
The SMMP diversion and storage at Cope Lake and Lake G would be implemented through Project R.5-3 (Arroyo las Positas Diversion to Chain of Lakes Downstream of Las Positas Golf Course) and Project R.6-2 (Arroyo Mocho Bypass and Regional Storage at Chain of Lakes). The projects include stormwater diversion structures (R.5-3 and R.6-2), diversion channels (R.5-3 and R.6-2), distribution and storage (R.5-3), and stormwater return components (R.6-2).



SOURCE: RMC, 2005

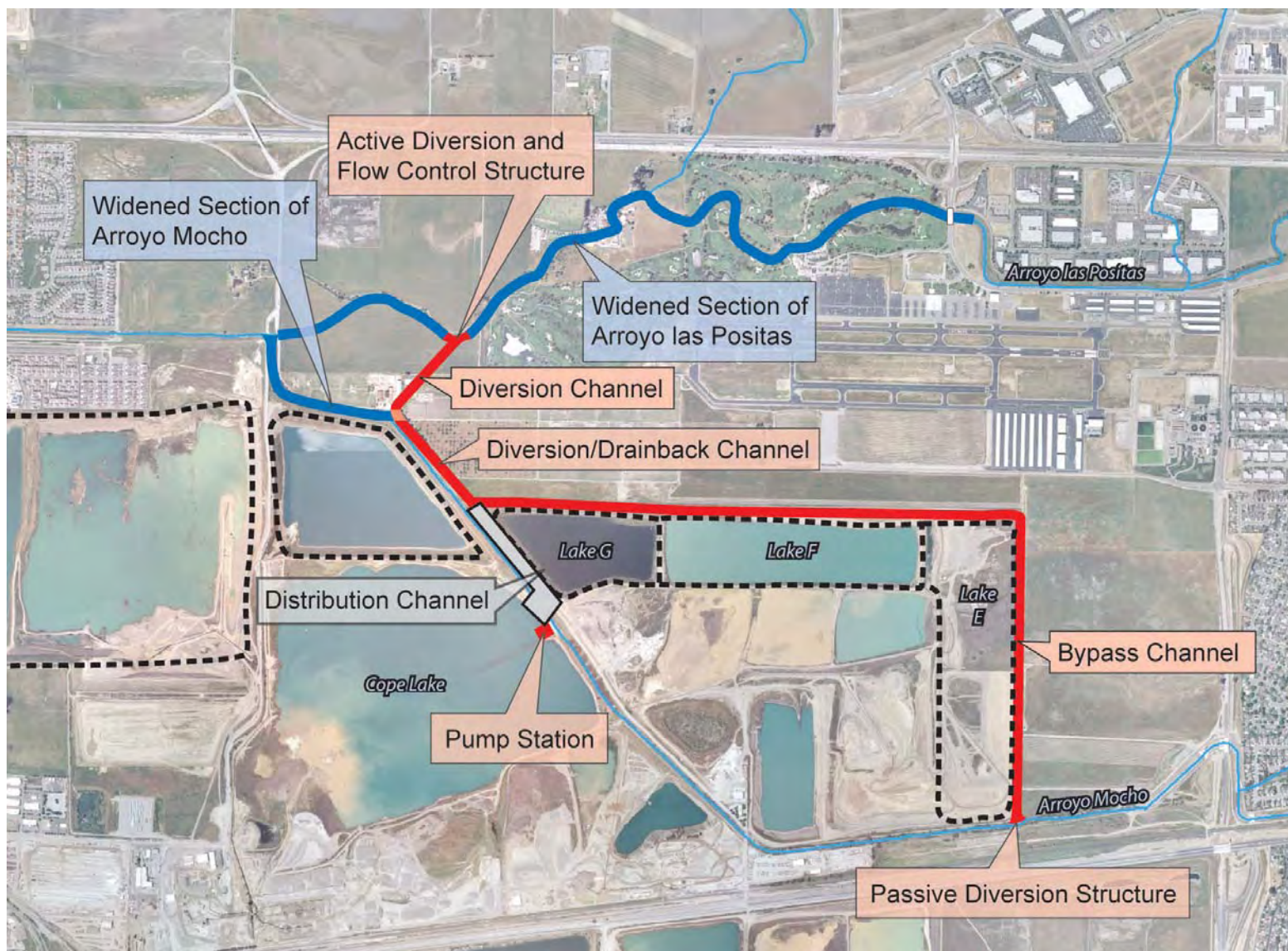
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Figure 2-16
SMMP Reach 11 Projects



SOURCE: RMC, 2005

Zone 7 SMMP . 203485
Figure 2-17
SMMP Reach 12 Projects



SOURCE: RMC, 2004

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Figure 2-18
Chain of Lakes Modifications

Diversion Structures

There would be two stormwater diversion structures included in projects R.5-3 and R.6-2, one located on Arroyo las Positas and the other on Arroyo Mocho. The Arroyo las Positas stormwater diversion structure would include a side-weir and automated gates to convey flood flows to storage. Excess flows contained by the flow control structure would overtop the side weir and be directed into the diversion channel extending to Cope Lake and Lake G.

The Arroyo Mocho bypass structure would include a passive design such as a broadcrested ogee-type weir for the overflow, which minimizes turbulence immediately downstream of the weir, providing a safer passage for fish, should they overtop the weir. Precautions would be taken to limit the ability of fish to overtop the weir, such as constructing the weir to have a very low head. Once flows overtop the weir, they would be conveyed in the Mocho bypass channel to the diversion/drainback channel. From the diversion/bypass channel, flood flows from Arroyo Mocho could be conveyed either to storage or out of the bypass system to the widened section of Arroyo Mocho, as described below.

Diversion/Drainback Channel

From the Arroyo las Positas side weir, diverted water would be carried along an earthen-lined channel. The portion of this channel between the side weir on Arroyo las Positas and the gated outlet to a widened Arroyo Mocho (at El Charro Road) is already designated as a floodplain. The Arroyo Mocho bypass channel would join the diversion/drainback channel just west of the northwest corner of Lake G.

Given that the diversion/drainback channel is a level channel connecting two points (Cope Lake and the widened section of Arroyo Mocho), it would act as a drainback channel to return detained stormwater to the widened section of Arroyo Mocho when the Cope Lake water elevation is greater than the water surface elevation at the outlet.

Distribution Channel and Storage

The main function of the distribution channel is to divert flow to Cope Lake and other lakes (Lakes E, F, and G, if necessary) for detention. The west side of the channel would incorporate an outlet to the proposed underground box culvert, to convey flows to Cope Lake. Flow would be routed to Cope Lake first, but once Cope Lake becomes full, flow would be routed to Lake G. Therefore, the east side of the distribution channel would include a gated side weir to divert flows to Lake G.

To provide an independent outlet to Lake G, and to bypass rather than detain Mocho bypass flows, gates along the inlet to the box culvert would be included. The gates would be closed, and no stormwater would enter Cope Lake in a 5-year frequency storm. If the flows reach 2,000 to 5,000 cfs in Arroyo Mocho downstream of the Chain of Lakes (estimated to occur on a 6 to 7 year rainfall event), the gates would be opened, and flow would be directed to Cope Lake.

The Stormwater Return System

Project R.6-2 includes construction of a stormwater return system from Cope Lake, which would be activated based on flow within the diversion/drainback channel. The gates on the Arroyo Mocho end of the diversion/drainback channel would dictate whether flow would be conveyed out of the system (down Arroyo Mocho at El Charro Road), or into Cope Lake and/or Lake G for detention storage. When the gates are closed during high flow events and the water level in Cope Lake is lower in elevation than the gates, stormwater would be conveyed along the diversion/drainback channel towards the distribution channel at Cope Lake. The gates at widened Arroyo Mocho would be opened when the flow contribution from downstream Arroyo Mocho drops below 2,000 to 5,000 cfs. When the gates at widened Arroyo Mocho are opened, the stormwater in the diversion/drainback channel and in Cope Lake that is higher than an elevation of about 342 feet would be drained by gravity through the channel and into the widened section of Arroyo Mocho through the flow control structure. Flow would be returned from storage to the widened section of Arroyo Mocho as soon as possible (i.e., when flows are less than 2,000 to 5,000 cfs), in order to free-up storage capacity in Cope Lake in preparation for the next storm event.

Water below the level of the channel would remain in Cope Lake and would require removal through pumping. Fish screens would be incorporated into the intake structure. When the elevation of Cope Lake reaches about 342 feet, and water in Cope Lake can no longer drain into the diversion/drainback channel by gravity flow, the pumps would engage and water would be pumped into the channel and/or Arroyo Mocho. The gates on the underground box culvert at the distribution channel would be closed to keep water that is pumped into the diversion/drainback channel from flowing back into Cope Lake.

2.5 Implementation Schedule

The SMMP will function as a program for implementation by Zone 7 within the context of the approved General Plans of local municipalities in the Zone 7 service area. It is intended to meet the stream management needs of the Zone 7 service area through buildout of these General Plans. As such, individual projects would be developed for implementation through the course of the current planning horizon for these documents (2020-2030). Development and implementation of individual projects would be contingent upon funding sources and agency partnering. Because long term implementation planning will be required to develop project partnerships and develop a comprehensive financing program, a specific capital improvement program or scheduling mechanism has not been identified at this time. In general, design and permitting activities for individual projects are anticipated to be completed on a two to four year timeframe, with construction activities being implemented during dry season months.

2.6 SMMP Project Construction

Project implementation would consist of ground disturbing activities ranging from paving existing maintenance roads to accommodate use as a trail, to excavation of upland areas to create

wetlands and pools, to the construction of levees and bank stabilization. In-channel disturbing activities range from minor activities associated with adding vegetation (without changing side slope configuration) to existing channels, to modifying channel slopes, to excavating sediment, channel stabilization and removal of fish barriers. In addition, the SMMP proposes to modify culverts and bridges, resulting in ground and in-channel disturbance as well as disruption to roads and streets with attendant noise, air quality (e.g., dirt), and traffic impacts.

Summary of Anticipated Construction Area by Activity

Implementation of the SMMP would result in a variety of impact types at varying locations within the SMMP project area. Through the establishment of Resource Goals to meet multiple objectives, project development has focused on multi-benefit projects. All of the projects proposed would result in some level of alteration of existing physical conditions within or adjacent to stream channels within the SMMP project area. These alterations would result in the temporary disturbance, permanent loss, or permanent enhancement of various resources within the SMMP project area. **Table 2-5** provides a summary of the anticipated area associated with anticipated activities under the 45 projects included in the SMMP.

In general, the SMMP would provide adequate flood protection in the channels in the project area through implementation of regional storage, sediment removal, low-flow channel installation, wetland creation, and riparian corridor enhancement to provide bank stabilization. Projects implemented under SMMP would develop regional storage at the existing Lake G and Cope Lake, and would implement one-time sediment removal on a project-by-project basis to reestablish channel capacity for approximately 19,000 linear feet of channel. Other channel capacity improvements would include use of flood walls along the top of existing embankments, channel widening, and removal of in-channel maintenance roads to improve channel capacity. SMMP implementation would also include the following riparian and habitat enhancements to existing stream channels: establishment of 40,000 linear feet of low-flow channel, implementation of riparian planting and vegetation management along 76,300 linear feet of channel bank, and application of invasive species control along 21,000 linear feet of channel bank. To more effectively manage sediment deposition and removal, the SMMP includes establishment of 6 sediment basins, and includes implementation of bio-technical bank stabilization along approximately 61,500 linear feet of channel bank to reduce bank failure and erosion. The SMMP includes creation of 28 acres of in-stream and off-channel wetlands, dedication of 22 acres for habitat conservation, and dedication of 146 acres of land for floodplain management. The SMMP would remove 10 existing fish barriers within the Upper Alameda Watershed, and would create 36.7 miles of multi-use recreational trail along existing stream channels.

**TABLE 2-5
PROJECT OVERVIEW**

Improvement type	Number of Projects	Reaches where the Improvement will occur	Length or Area Affected			
			Length/#	Units	Area/Length	Units
Trail	30	1,2,3,4,5,6,7,8,9,10,11	193,578	feet	36.7	miles
Sediment basin	6	1,3,5,8	13	acres		
Sediment removal	10	1,5,8,9	254,115	CY	19,075	feet
					3.6	miles
					13.1	acres ^a
Wetland mitigation	9	1,5,8,9			52	acres
Land dedication (habitat)	2	1,6			22	acres
Riparian planting and vegetation management	20	1,2,3,5,6,7,8,9,10	76,330	feet	70.1	acres ^b
Invasive species control	5	1,3,7	21,000	feet	19.3	acres ^b
Bridge crossing modification	1	1	1	each		
Low-flow meandering channel	5	1,6,8,9	40,000	feet	7.6	miles
Culvert replacement	4	1,8,9	13	each		
Off-line seasonal ponds	2	1	1	acres		
Bio-technical bank stabilization	27	1,2,3,8,9,10,11,12	61,489	feet	56.5	acres ^b
Wetland creation	2	1,3	28	acres		
Grade control structure (i.e. rock vane)	8	1,8,10	13	each		
Channel widening	7	1,5,6,8	28,100	feet	5.3	miles
Upgrade of maintenance road to trail standard	5	2,7,8,10	17,700	feet	3.4	miles
Floodwall	7	2,8,9	17,530	feet	3.3	miles
Recreational features (indoor classroom)	1	3	1	each		
Levees	7	2,3,5,10	15,500	feet	2.9	miles
Fish barrier removal	9	3,6,7,8,10	10	each		
New channel	2	5,6	15,750	feet	3.0	miles
New pump station	2	6,8	2	each		
Concrete lining	3	8,9	10,200	feet	1.9	miles
Fencing for stream protection	1	5	1,500	feet	0.3	miles
Meandering channel	2	2,10	5,200	feet	1.0	miles
Overflow structures	1	6	1	each		
Turnout construction	2	3,4	2	each		

^a Assumes channel bottom width of 30 feet.

^b Assumes both banks, 20 foot width.

Equipment

Equipment usage would depend on the individual needs of each project type, as well as the discretion of individual contractors. The following presents a range of equipment types that would be likely to be used during implementation of the SMMP.

- Pavement saw
- Jackhammer
- Grader
- Excavator
- Compactor
- Bulldozer/backhoe/loader
- Flatbed trucks
- Drill rig Cyclone filter
- Pump rig
- Welding rig
- Forklift
- Manlift
- Jumping jacks
- Concrete pumper
- Water pump and treatment skid
- Vacuum truck
- Sand shaker
- Crane
- Boom truck
- Water truck
- Generators
- Concrete trucks
- Baker tanks
- Paving equipment
- Dump trucks

Construction Crews/Duration

The type of project would dictate the number of workers at a site and the duration of activities (see **Table 2-6**). For example, major erosion and sedimentation projects could require construction crews of up to 20 construction workers, and could have a 6-8 month duration.

General construction timeframes and crew size estimated for SMMP project implementation are shown in **Table 2-6**. This table is not a comprehensive list of project types but provides general timeframes and crew sizes for a large portion of project types in the SMMP. Major construction projects spanning 7 months or greater would be implemented over two construction seasons, typically running from April to mid October. **Table 2-7** lists the duration and crew size for project construction by project type. Minor projects, such as revegetation of channel banks, could require a crew of three to four people for a 2-day period, working principally with hand tools.

2.7 Routine Maintenance of SMMP Projects

This section discusses the anticipated maintenance activities associated with the proposed SMMP projects. These activities would be implemented regularly to maintain channels and facilities to design condition. Maintenance activities can be grouped into seven major categories:

- Sediment removal
- Bank stabilization
- Vegetation removal
- Bikeways and trails repair
- Wetland & off-stream seasonal pond maintenance
- Minor maintenance
- Maintenance of flood control structures and equipment

TABLE 2-6
ANTICIPATED CONSTRUCTION DURATION, BY PROJECT^a

Reach/Project	Estimated Construction Duration	Estimated Construction Crew Size
Reach 1		
R.1-1	6 months	6 to 10
R.1-2	1 month	5
R.1-3	2.5 months	6 to 10
R.1-4	3 months	3 to 5
R.1-5	3 to 6 months	12
R.1-6	6 months	12
R.1-7	1 year	12
Reach 2		
R.2-1	8 months	20
R.2-2	8 months	10
R.2-3	3 weeks	6 to 10
Reach 3		
R.3-1	7 months	NA
R.3-2	8 months	12
R.3-3	24 months	10
R.3-4	3.5 months	8 to 10
R.3-5	2 months	8 to 10
Reach 4		
R.4-1	7 months	NA
R.4-2	6 months	6 to 10
Reach 5		
R.5-1	14 weeks	6 to 10
R.5-2	4 months	8 to 10
R.5-3	2 to 3 years	20 to 30
Reach 6		
R.6-1	16 months	15 to 20
R.6-2	1 year	20 to 30
Reach 7		
R.7-1	7 months	6 to 10
R.7-2	4 weeks	6 to 10
R.7-3	5 months	10
Reach 8		
R.8-1	1 month	6 to 10
R.8-2	14 months	30
R.8-3	21 months	12
R.8-4	8 months	10
Reach 9		
R.9-1	8 months	12
R.9-2	3.5 months	15 to 20
R.9-3	3.5 months	15 to 20
R.9-4	16 months	15 to 20
R.9-5	6 months	6 to 10
R.9-6	6 months	10
R.9-7	2.5 months	10
Reach 10		
R.10-1	6 to 8 months	10
R.10-2	7 months	10 to 15
R.10-3	6 to 8 months	10 to 15
R.10-4	1.5 months	12
R.10-5	approximately 22 months	12
Reach 11		
R.11-1	7 weeks	6 to 10
R.11-2	1 week	12
Reach 12		
R.12-1	21 months	12
R.12-2	NA	NA

^a Time periods and crew numbers based on highest numbers provided per project

TABLE 2-7
ANTICIPATED CONSTRUCTION DURATION AND CREW SIZE, BY PROJECT TYPE
 (examples of project types not comprehensive)

Project Type	Duration	Crew Size
Trail Construction	10 working days/2 weeks:3,960 feet/ 3/4 mile of trail	6 to 10
Vegetation Work	3 weeks for 2,500 feet of planting	6 to 12; one project with 20
Levees and Bank Stabilization	10 working days/2 weeks per 200 feet of bank stabilization 1 to 2 months per 1 500-foot long levee	Most projects 8 to 12; a few 20 to 30 (channel widening)
Sediment Basin	1 week for sediment basin with capacity of 200 cubic yards	3 to 5 for smaller basins, 8 to 10 for larger
Sediment Removal	Minimum of 200 CY per day	3 to 5
Wetland/Pond Creation	3 months to 1 year	3 to 5
Fish Barrier Removal	Most projects 1 to 2 months; several 6 to 8 months	8 to 15

Before routine maintenance is initiated, a plan of maintenance activities would be developed annually, with projected work based on historical needs, field inspections, and comments from the public. Work orders would be developed and would include appropriate best management practices (BMPs) and permit requirements such as site surveys to identify the occurrence of special-status plant and wildlife species. Notification to all affected parties would be done prior to commencement of maintenance activities. A more detailed description of the activities associated with each maintenance category follows.

Sediment Removal

A number of sediment basins have been proposed in the SMMP to manage sediment loads in the channels. Sediment would be allowed to accumulate in these basins until the accumulation reaches one-half the designated sediment storage volume, at which point the sediment would be removed to restore the sediment basins to the design conditions. Field inspection of all proposed basins would be conducted annually, as well as immediately following significant flow events. Sediment sampling would be conducted prior to removal activities to characterize its physical and chemical properties. Sediment characterization would allow the agency to identify the appropriate BMPs to implement during removal activities. Water quality monitoring, as necessary, would also be conducted for all basins where creek flow is diverted around the basin. Water quality samples, as necessary, would be taken immediately upstream and downstream of the sediment basin prior to and after sediment removal activities. Wet sediment would be stockpiled outside the stream whenever possible or within the dewatered sediment basin and would then be transported to an appropriate off-site landfill facility.

Bank Stabilization

Maintenance of proposed SMMP bank stabilization projects would be conducted to prevent further bank erosion. Annual maintenance activities would include repair of damaged bank protection and grade control structures such as the proposed j-hook weirs, rock vortex weirs, log crib walls, or vegetated riprap measures. Damaged structures would be identified during the annual inspection of project sites and during emergency inspections following significant flow events. Other activities would include monitoring vegetation survival rates at project sites where biotechnical bank protection measures are used for erosion control purposes (i.e. live staking, rootwads, brush mattresses, etc.) and replanting after the second growing season, as needed. Inspection and maintenance of any installed irrigation system would also be conducted.

Vegetation Removal

Non-native invasive species and downed vegetation that presents a public hazard would be removed to maintain the channel conveyance capacity and ensure establishment of native riparian habitats. Projected vegetation clearing activities would be based on historical needs, inspections, and comments from the public. The frequency of vegetation management would depend on the characteristics of the channel and would vary from every few years to annually. Vegetation clearing would be conducted in a combination of methods depending on site conditions:

- Hand removal of vegetation and overhanging growth would be conducted when the site has limited access and when sensitive special-status species have been identified.
- Mechanical clearing using mowing and discing equipment would be done along the channel banks.
- Chemical clearing using herbicides selectively sprayed at the target species. Herbicide application would be conducted in the channel, along channel banks, on levees, and on unpaved maintenance roads. Herbicides and surfactants registered for aquatic use would be selected if application is to occur on the streambed or within the channel banks. Annual treatment may be necessary, however, the treatment area would be limited since herbicides would not be broadcast sprayed across the channel but would be instead sprayed at plants targeted for removal. Herbicides used would be in accordance with the U.S. Environmental Protection Agency (EPA), the California Department of Pesticide Regulation, and the County Agricultural Commission.

Bikeways and Trails Repair

Maintenance of trails is key in promoting user safety and guaranteeing public access. Trails with a hardened surface such as asphalts would be subject to cracking and would require periodic sealing or recoating. Regular inspections of trails would be conducted to identify maintenance needs. Other maintenance activities would include clearing downed trees and debris from the trail path, clearing and maintaining drainage features to minimize trail erosion, checking and restoring the structural integrity of all built trail features (e.g. bridges, steps, or railings), repairing or replacing informational signs, and repairing fences.

Wetland and Seasonal Pond Maintenance

Visual monitoring of vegetative cover and species composition would be conducted to estimate development of wetland vegetation, species diversity, and presence or absence of target and non-native species. Removal of non-native species would be conducted, as needed. As required, replacement of wetland vegetation would be needed after the second growing season. Surface water quality monitoring would also be conducted to monitor the effectiveness of the wetland in treating stormwater runoff.

Minor Maintenance

Minor maintenance activities would include trash removal; repair and restoration of fences and gates; unblocking drainage structures such as outfalls, culverts, or flap gates; and graffiti removal.

Maintenance of Flood Control Structures and Equipment

Inspection of flood control facilities such as pumps, levees, floodwalls, pipes, valves, box culverts, weirs, gates, or bridges would be conducted regularly. Maintenance of these facilities would be conducted on an as needed basis.

Flood Control Maintenance Access Roads

Maintenance of the access roads would include grading, maintaining aggregate rock surface, vegetation management, maintaining drainage features, etc.

2.8 Alternatives

An EIR must describe a range of reasonable alternatives to the proposed project or alternative project locations that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts to the proposed project. The alternatives analysis must include the “No Project Alternative” as a point of comparison. The No Project Alternative includes existing conditions and reasonably foreseeable future conditions that would exist if the project were not approved (CEQA §15126(d)). **Chapter 6** provides a comparison of the alternatives.

No Project Alternative

Discussion of the No-Project Alternative must examine the existing conditions and reasonably foreseeable future conditions that would exist if the project were not approved (CEQA §15126.6(e)). Under the No Project Alternative, Zone 7 would not implement construction of facilities identified under the SMMP. When considered in the context of existing conditions, this would avoid the construction of the 45 projects identified under the SMMP. When considered within the context of reasonably foreseeable future conditions, Zone 7 would continue its existing flood control and channel maintenance activities. Zone 7 would develop individual capital improvement projects, as well as continue annual maintenance, on a case-by-case basis as funding

under the Special Drainage Area (SDA 7-1) Program allows. This alternative assumes the current level of project development and maintenance activities are implemented into the future.

Buildout of 1966 Master Plan via Special Drainage Area 7-1 Program Funding

Under this alternative, Zone 7 would implement improvements as defined in the 1966 Master Plan, which identifies channelization and improvements to approximately 100 miles of stream channel to provide flood protection. Buildout of the 1966 Master Plan would be implemented using the Special Drainage Area (SDA 7-1) Program, which is currently the Agency's only source of revenue for new improvements to the existing flood control system. Ordinance 53 was established to collect drainage fees from new developments to help fund improvements of the SDA 7-1 Program. Under this program, Zone 7 enters into agreements with developers to take ownership, and thus maintenance responsibility, of the facilities that are constructed to Agency standards. The developers are reimbursed a predetermined amount for the channel improvements and right of way.

Implementation of the 1966 Master Plan using the SDA program criteria would result in improvements to channels throughout the Zone 7 service area to accommodate 100-year flows at buildout. However, the SDA program is limited to the funding of new flood control facilities related to development. To provide for adequate gravity flow to meet existing and future 100-year flows, a series of improvements within the Chain of Lakes area would be required to provide adequate channel capacity to contain and convey 100-year flows through the Chain of Lakes area to Arroyo Mocho. Arroyo Las Positas through the Las Positas Golf Course would have to be enlarged to contain and convey 100-year flow. Arroyo Mocho would require sediment removal and channel enlargement to restore its design capacity to convey 100-year event flow to ADLL. Finally, channelization of ADLL would be necessary to increase its current capacity of 18,700 cfs to accommodate the projected 100-year flow of 25,500 cfs at buildout.

Flood Detention and Conveyance Alternative

The Flood Detention and Conveyance Alternative would reduce the number of projects implemented under the SMMP by including only the minimum projects necessary meet the basic project objective for flood protection during a 100-year event. Projects that could be included under the Flood Detention and Conveyance Alternative would include channel conveyance to the Chain of Lakes, detention storage at the Chain of Lakes, and channel improvements downstream. Projects that would be implemented under this alternative include R.6-2, R.8-3, R.8-4, and R.10-1 through R.10-5. Implementation of these projects would substantially alleviate capacity deficiencies and reduce potential flooding effects from 100-year flood events.

2.9 Intended Uses of the MEIR and Additional Approvals

The Zone 7 Board of Directors intends to use this MEIR to approve the SMMP as part of the long-term program guiding flood management within its service area. As provided for in CEQA

Section 15176 and Section 15152, this MEIR is intended to be used by Zone 7 and other agencies as a “first tier” document, with subsequent CEQA analysis of individual projects implemented by Zone 7, or other agencies, tiered from this document.

In addition, regulatory agencies may rely on this MEIR, in whole or in part, for the issuance of regulatory permits for the SMMP as a whole, or individual projects as they are developed for implementation. These permits may include, but are not limited to:

- The MEIR would support applications to the U.S. Army Corps of Engineers (Corps) for Nationwide or Individual Permits and provide supplemental information for the Corps’ permit review.
- The MEIR would assist the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) in assessing impacts and take of threatened and endangered species, and in preparing biological opinions under Section 7 of the Endangered Species Act (ESA).
- The San Francisco Bay RWQCB would use the MEIR during the process of State Water Quality Certification and waste discharge requirements for the projects, as appropriate.
- The California Department of Fish and Game (CDFG) would use the MEIR when negotiating Streambed Alteration Agreements for individual projects and renegotiating or replacing Routine Maintenance Agreements (RMAs) with Zone 7 for maintenance of the SMMP projects. CDFG would also use information provided in the MEIR to determine if the activities would affect species protected by various California endangered species laws.

Other ministerial permits/approvals not dependent on the MEIR include:

- Boring and jacking permit from California Occupational Safety and Health Administration (Cal-OSHA) (if applicable).
- Roadway encroachment permits/licenses from Alameda County Public Works and/or from the Cities of Pleasanton and Livermore.
- Encroachment permits from Alameda County, California Department of Transportation (Caltrans) (State Route and highway easements), Southern Pacific Railroad (SPRR), and Union Pacific Railroad (UPRR) (if applicable).
- Heritage tree removal permit from the City of Pleasanton Public Works Department; and/or vegetation removal permit from the Livermore City Superintendent; and / or approval of a Tree Replacement Plan from Alameda County (if applicable).
- Temporary or Permanent Easements from affected jurisdictions for site access, utility siting, etc.

References – Project Description

Zone 7 Water Agency. 2006. *Stream Management Master Plan*. Prepared by RMC 2006

CHAPTER 3

Environmental Setting, Impacts, and Mitigation Measures

3.1 Introduction

The SMMP Master EIR analyzes, at a preliminary level, the potential environmental impacts of anticipated subsequent projects. The discussion of impacts is commensurate with the level of specificity of the SMMP. Site specific development and resource management projects for the SMMP will be subject to subsequent project-level CEQA compliance and to permitting requirements and approval of other agencies, such as the California Department of Fish and Game and the State Water Resources Control Board, and others as specific projects are proposed for implementation.

The SMMP EIR constitutes the first tier of environmental review. “Tiering” in an EIR allows agencies to address broad environmental issues at the planning stage, followed by more detailed examination of actual development projects that are consistent with the SMMP in subsequent EIRs or negative declarations. Later EIRs and negative declarations incorporate, by reference, the general discussions of the broader EIR (the SMMP MEIR) and concentrate solely on the discussions specific to the later projects, such as specific facility locations and construction requirements (Public Resources Code Section 21093; State CEQA Guidelines, CCR Section 15152).

3.2 Hydrology and Water Quality

3.2.1 Setting

Introduction

Surface water features of the SMMP project area (project area) include arroyos and creeks within the upper Alameda Creek Watershed. These features include both natural channels and those improved for flood control and drainage. The surface water hydrology of the planning area is described below, first in a regional overview and subsequently by local watershed and drainage features. Most of the information in this section is based on sections of several surface water hydrology and water quality documents completed in the project area vicinity, including the Draft EIR for Dublin San Ramon Services District (DSRSD) Clean Water Revival Project (DSRSD, 1997), Livermore-Amador Valley Water Management Agency (LAVWMA) Export Pipeline Facilities Project EIR (1997), the Alameda County East County Area Plan (2002), the City of Pleasanton General Plan (1996), and the City of Livermore General Plan (2004).

Regional Setting and Hydrology

The Alameda Creek watershed (approximately 630 square miles) covers portions of three counties: approximately 55 percent lies within Alameda County, 10 percent lies within Contra Costa County, and 35 percent lies within Santa Clara County. Five incorporated cities are completely or partially located in the watershed: Livermore, Pleasanton, Dublin, and the southeastern portions of San Ramon and Danville (Alameda County Water District, 1990).

The Alameda Creek watershed lies within the California Coast Ranges geographic unit, which is composed chiefly of a complex assemblage of marine sedimentary rocks and a series of northwest-trending ridges and valleys (Rantz, 1972). The watershed is generally defined by the Altamont Pass (near Livermore) to the east, Mount Diablo to the north, Mount Hamilton to the south, and its outlet to San Francisco Bay in Union City on the west. The southern portion of the watershed consists of higher elevations and more rugged topography and is relatively undeveloped. This portion of the watershed contains the long and narrow Alameda Creek/Sunol, Arroyo del Valle, Arroyo las Positas, and Arroyo Mocho sub-basins (watersheds), all draining to the northwest and flowing into the Livermore-Amador Valley (**Figure 3.2-1**). The northern portion of the watershed consists of the predominantly developed Livermore-Amador Valley and includes the broader, less steep Alamo Creek/Canal, Tassajara Creek, and Arroyo las Positas sub-basins (watersheds).

The regional climate is mediterranean with cool, wet winters and warm, dry summers. Precipitation and runoff are generally highest in the Sunol drainage unit (i.e., the Alameda Creek headwaters area, just to the west of the Arroyo del Valle watershed), decreasing with distance eastward and north over the Livermore-Amador Valley; annual average precipitation ranges from about 30 inches near the headwaters of Alameda Creek in the southwest, to 22 inches near Pleasanton in the Livermore-Amador Valley, to about 12 inches near the east edge of the Valley (Rantz, 1971).

The long-term (water year¹ [WY] 1872 through 2003) mean annual precipitation recorded at Livermore is 14.6 inches. The historic record indicates that a period of above or below average precipitation can last more than six years, such as the recent dry period that extended from WY 1987 through 1992. **Figure 3.2-2** helps demonstrate the variable nature of rainfall and the periodicity of prolonged wet and dry periods for the Livermore-Amador Valley. Most rainfall occurs from December through February, with little or no rainfall during summer months. Based upon 107 years of rainfall data for Livermore, the 100-year storm is estimated to produce about 3.32 inches in a 24-hour period (Goodridge, 2005).

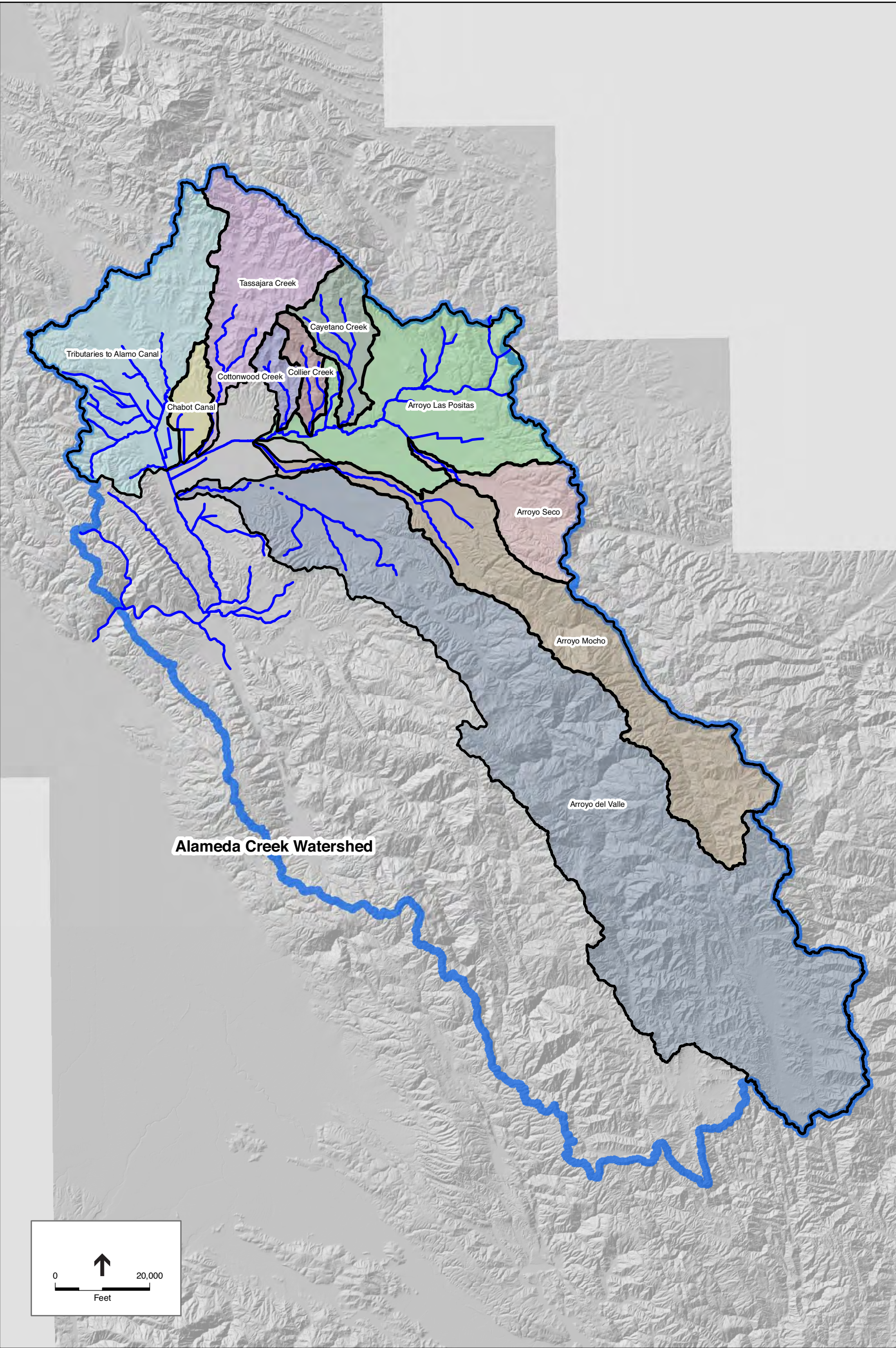
The Alameda Creek watershed experiences highly variable annual runoff and is subject to periodic droughts. Alameda Creek is usually a perennial stream in the upper parts of the watershed, but in the Sunol Valley a high rate of infiltration normally results in a dry creek during the summer months (Gunther et al., 2000). Many of the tributaries that supply flows to Alameda Creek are historically intermittent and can become isolated from the mainstem beginning in early to mid-summer. This is especially true of streams, both natural and channelized, draining the Livermore-Amador Valley (Gunther et al., 2000). The arroyos and creeks draining to the Livermore-Amador Valley exhibit highly variable daily flows and rarely, if ever, experience a perennial flow regime in their lower reaches.

The project area is located within and adjacent to intermittent and perennial arroyos, creeks, and flood control channels that traverse the alluvial Livermore-Amador Valley floor (within the Livermore drainage unit)². The major streams in the Livermore drainage unit are Arroyo de la Laguna (ADLL), Arroyo del Valle, Arroyo Mocho, Arroyo las Positas, Tassajara Creek, and the Alamo Canal. Arroyo del Valle and Arroyo las Positas represent the largest watersheds relevant to the SMMP project area, at 160 and 80 square miles, respectively. However, since a majority of the Arroyo del Valle watershed drains to Del Valle Reservoir, Arroyo las Positas likely has the largest “effective” watershed in terms of the SMMP project area. Arroyo del Valle and Arroyo Mocho converge on the floor of the Livermore-Amador Valley and drain into Arroyo de la Laguna at its confluence with Alamo Canal. ADLL eventually drains into Alameda Creek at the outlet of the Livermore drainage unit. The total area of the Livermore drainage unit is about 426 square miles (Alameda County Water District, 1990).

Figure 3.2-3 presents flow duration curves, over a common period of record (WY 1979-1983), for the major project area drainages as an example of the similarities and differences in the general distribution of flow in their lower reaches. The flow duration curve is the simplest means of expressing the time distribution of discharge; a steeply sloping duration curve is characteristic of a highly variable stream, the flow of which is primarily from direct runoff (Leopold, 1994). The runoff pattern of the Alameda Creek watershed generally follows the precipitation distribution, with a larger portion of the precipitation converted to runoff in areas receiving more rainfall, on average (Rantz 1974).

¹ A Water Year begins on October 1 of the previous year and ends on September 30 of the designated Water Year. For example, Water Year 2004 comprises October 1, 2003 through September 30, 2004.

² For purposes here, the Livermore drainage unit refers to the collection of watersheds draining to Arroyo de la Laguna (most of which are depicted in **Figure 3.2-1**).



SOURCES: USGS, 2003 (Topography)
RMC, 2005 (Subwatersheds)
ESA, 2005 (Entire Watershed)

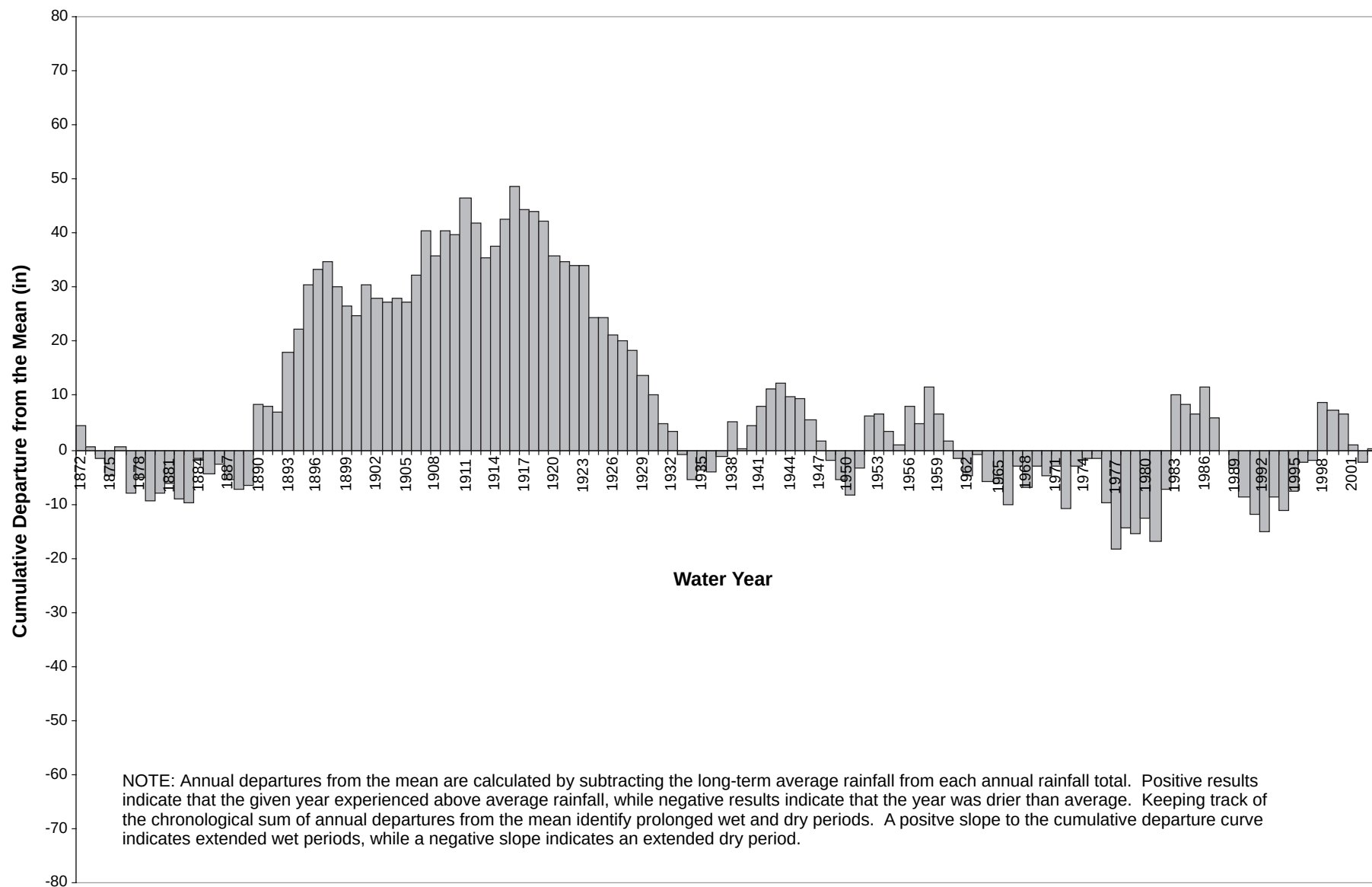
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Figure 3.2-1
Alameda Creek and Livermore-Amador Valley Watersheds

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Livermore CA Rainfall: Cumulative Departure Chart for WY 1872-2003

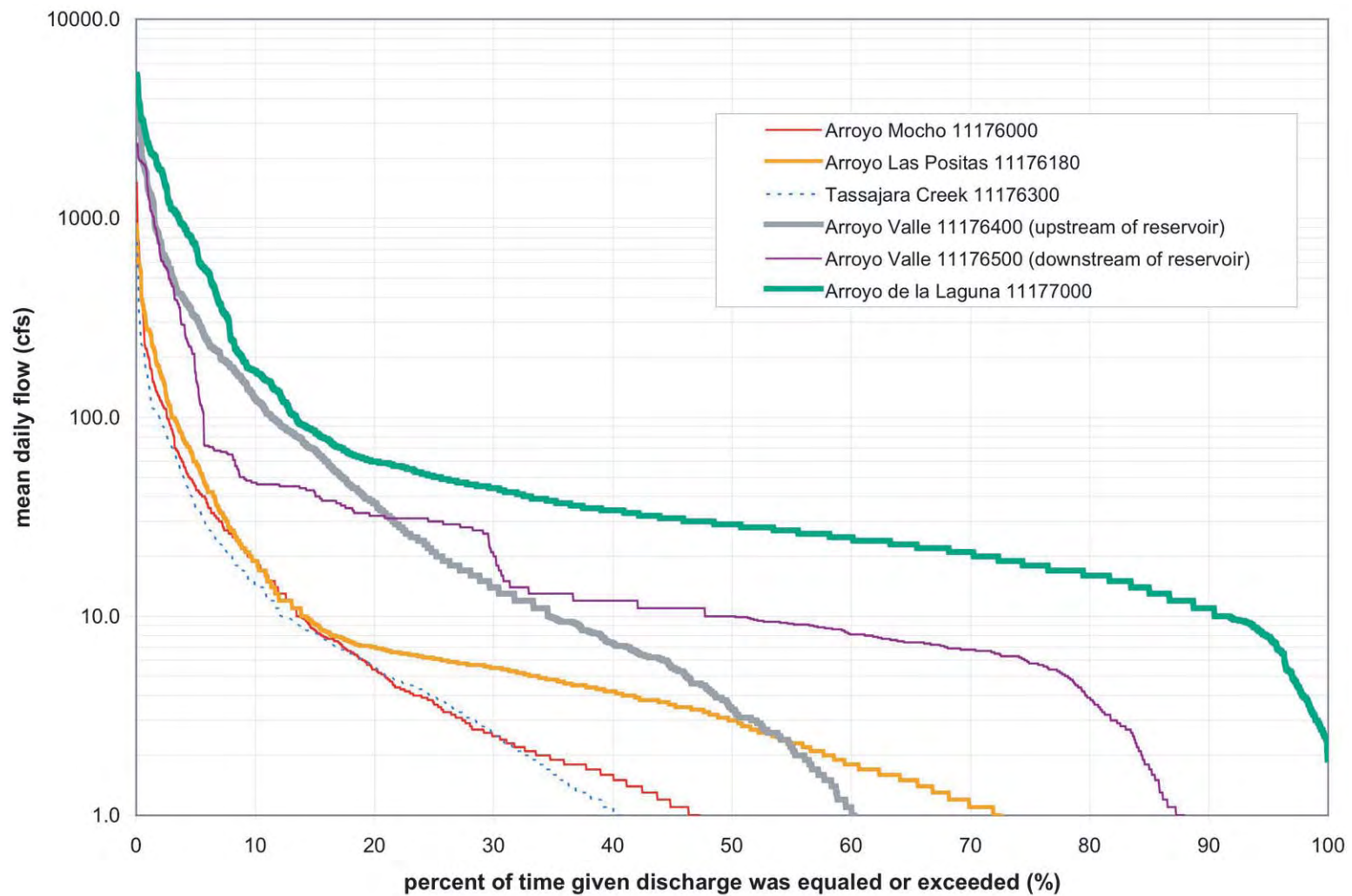
mean annual ppt =14.63 inches



SOURCE: Environmental Science Associates
Global Historical Climatology Network (GHCN)
Western Regional Climate Center - Desert Research Institute

Zone 7 SMMP . 203485

Figure 3.2-2
Long-Term Rainfall



SOURCE: Environmental Science Associates

Zone 7 SMMP . 203485

Figure 3.2-3
Regional Flow Duration Curves
(Water Year 1979-1983)

In Rantz' (1974) comprehensive study of natural runoff in the San Francisco Bay region, the calculated mean annual runoff for the Alameda Creek headwater area, Arroyo del Valle, and Arroyo Mocho were 6.6 inches, 2.6 inches, and 1.3 inches, respectively. These values represent rainfall to runoff ratios (i.e., the portion of rainfall that becomes runoff) of 0.23, 0.13, and 0.08, respectively.

As described in **Chapter 2, Project Description**, flood control within the Livermore-Amador Valley area is primarily under the jurisdiction of Zone 7, the City of Livermore, and the City of Pleasanton. Zone 7 maintains improved flood control channels and installs new drainage channels as needed. In the past, flooding has occurred within the Livermore-Amador Valley at several locations, including: ADLL between Arroyo Mocho and Bernal Avenue; Arroyo Mocho between Alamo Canal and Santa Rita Road; Arroyo Mocho along Stanley Boulevard; and at the confluence of Arroyo las Positas and Arroyo Mocho (Zone 7, 2001). Additional areas have been impacted by flooding or channel damage, and include the reach of ADLL from above its confluence with Arroyo Mocho to the San Francisco Water Department's Bernal Property. These impacts have been limited primarily to channel damage and repair. Residential structures have not been affected.

Within the Livermore-Amador Valley there is no direct diversion of untreated surface water for municipal potable supply. However, diversion of released surface waters for irrigation does occur at Springtown Golf Course. Surface water recharge into the groundwater aquifer provides a major source of municipal and private potable supply. Similarly, downstream and west of the East Bay Hills in the Fremont area, the Alameda County Water District (ACWD) diverts surface water flow from Alameda Creek into the basin for groundwater recharge to replenish groundwater used for municipal supply. This supply is augmented by releases from the State Water Project (SWP) flows to Alameda Creek from the South Bay Aqueduct (SBA).

SMMP Project Area Local Watersheds and Project Reaches

Figure 3.2-1 depicts the principal watersheds draining to the project area. **Figure 2-5** (see **Chapter 2, Project Description**) identifies specific drainage features (creek, arroyos, and canals) within the SMMP project area and includes Arroyo del Valle, Arroyo las Positas, Arroyo Mocho, Alamo Canal, Tassajara Creek, Chabot Canal, Pleasanton Canal, and ADLL. A discussion of these drainages and the project reaches that are within the watersheds is presented below.

ADLL and Alameda Creek

ADLL, at its confluence with Alameda Creek, is the surface water outlet for all watersheds within the Livermore drainage unit and the project area. ADLL originates at the confluence of Alamo Canal and Arroyo Mocho and flows south to its confluence with Alameda Creek in Sunol. The channel is trapezoidal between Alamo Canal and confluence with Arroyo del Valle, and it originally had a bottom width of 80 feet, an average depth of 25 feet, and side slopes of about 2:1 (Zone 7, 2001). Channel capacity has been reduced by sediment deposition and bank instability. The channel, from Bernal Avenue south to Alameda Creek, is characterized by natural conditions with varying channel width, depth, and slope. Portions of ADLL are subject to sediment

deposition and dramatic bank erosion. However, ADLL remains the most natural stream in the SMMP project area with significant opportunities to stabilize the stream while maintaining and enhancing its habitat.

ADLL

Runoff records provide information on the characteristics of flow in the Alameda Creek watershed. Mean daily flow in ADLL near the Verona Bridge³ is approximately 76 cubic feet per second (cfs) and the median daily flow is around 20 cfs. As seen in **Figure 3.2-3**, the mean daily flow distribution is less variable compared to some of the upstream drainages and base-flow is typically present throughout the year. The highest peak flow recorded by the USGS gage was 11,400 cfs on January 5, 1982; however, this gage was inoperable during some years that most likely generated larger peaks (i.e., 1955 and 1986).

Projects R.8-4, R.10-1 through R.10-5, and R.11-2 (Sinbad Creek) are located within this section of ADLL. Substrates throughout ADLL are dominated by fine sand and silt particles and pools are infrequent and presumably shallow. Reach 10 extends along ADLL from its confluence with Arroyo del Valle downstream to its confluence with Alameda Creek. This section of ADLL, aside from the reach covered by Project R.10-1, has a somewhat natural meandering pattern. A broad alluvial floodplain is present downstream from the Castlewood Golf Course and continuing to Alameda Creek. Currently, ADLL downstream of Arroyo del Valle has a channel capacity of approximately 22,180 cfs. Hydraulic analysis conducted by RMC showed that ADLL downstream of Arroyo del Valle can convey the estimated 18,730 cfs flow resulting from regional storage. However, if all Zone 7 flood control channels are improved to Zone 7's Green Book standards, the resulting 100-year flow at this location is projected to increase to 25,500 cfs (Zone 7, 2006). Bank erosion occurs in pockets along the entire length of ADLL in Reach 10, but particular areas of concern include areas downstream of Bernal Bridge, and near Verona Bridge (Zone 7, 2006), as erosion in these areas can result in compromised bank stability. There are also erosion problems related to the confluence structure of Line B-2-1 and ADLL, which may have impacted the channel meander of ADLL and may contribute to erosion located on ADLL banks opposite the B-2-1 spillway.

Projects R.8-4 and R.10-1 comprise the modified, flood control channel portion of upper ADLL. Project R.8-4 (between Arroyo Mocho and Arroyo del Valle), due to excess sediment accumulation, is one of the main areas of concern in terms of current and future flood risk. The reach of ADLL covered by Project R.8-4 is subject to sediment deposition.

Project R.11-2 falls within Sinbad Creek, which flows southeast through a narrow canyon and drains into ADLL just upstream of ADLL's confluence with Alameda Creek. There is visible erosion in the lower reaches of Sinbad Creek and certain properties may eventually be affected if the bank undercutting persists.

³ USGS Gage no. 11177000 (Smithson *et al*, 2004) for WY 1970-2003. This period was chosen based on consideration of available years of record, consistency for comparison to other sites, and the Del Valle Reservoir, which was completed in September of 1968.

Alameda Creek

Alameda Creek originates near Packard Ridge, flows northwesterly to join Calaveras Creek within the Sunol drainage unit, and continues northward through the Sunol Valley to its confluence with ADLL (the outlet point for the Livermore drainage unit). From this confluence, Alameda Creek drains westward through the Niles Canyon to San Francisco Bay at Union City. Alameda Creek within Niles Canyon is a broad, deep stream with a varied combination of riffles, pools, and runs (Gunther *et al.*, 2000). This reach of Alameda Creek includes the Sunol and Niles dams. The reach covered in Project R.11-1 is comprised of Alameda Creek, through Niles Canyon from the ADLL confluence downstream to the Stonybrook Creek confluence. Project R.11-1 comprises only a foot trail along Alameda Creek and no instream work is proposed.

Arroyo del Valle Watershed

Arroyo del Valle drains approximately 160 square miles, the majority of which (approximately 130 square miles) drains into the Del Valle Reservoir. Flow downstream has been regulated by Del Valle Reservoir, which has a capacity of 77,100 acre-feet (af), since September of 1968. Flow in lower Arroyo del Valle is managed for groundwater recharge and controlled by releases from the reservoir; thus, the flow tends to be more sporadic and exhibits longer base-flow durations compared to the expected, natural distribution of flow. Downstream of the reservoir the hydrologic regime of Arroyo del Valle has been altered. However, it remains a relatively unchannelized stream that flows west through unincorporated Alameda County, Sycamore Grove Park, Shadow Cliffs Regional Recreation Area, and continues to meander through the City of Pleasanton to the confluence with ADLL. Arroyo del Valle includes a distinctive riparian corridor between the ADLL confluence and Stanley Boulevard.

Runoff records provide information on the characteristics of flow in Arroyo del Valle watershed. Rantz (1974) estimated natural runoff in the Arroyo del Valle watershed to be approximately 2.6 inches. The U.S. Geological Survey (USGS) runoff records demonstrate the variable (perennial vs. ephemeral) nature of daily flow in Arroyo del Valle, with a mean daily flow of 40 cfs and a median daily flow of 1.3 cfs just upstream of the Del Valle Reservoir.⁴ This is typical of watersheds with high variability in precipitation and low permeability in upland soils, resulting in high inter-annual flow variability.

Reaches 4 and 7 are located within the Arroyo del Valle watershed. Both of these reaches are critical for conveyance and groundwater recharge as part of the Zone 7 Artificial Stream Recharge Program. SMMP Project R.4-1 includes the section of Arroyo del Valle extending from Del Valle Reservoir downstream to Highway 84. This project essentially encompasses the Sycamore Grove Park (SGP) area. The sycamore grove experienced an episode of severe dieback and decline during the mid 1980s to early 1990s (Sycamore Associates, 2004), and natural recovery and recruitment within the grove has since been lacking. Zone 7 and the Livermore Area Recreation and Park District (LARPD) have analyzed the potential impact of Arroyo del Valle

⁴ USGS Gage no. 11176400 (Smithson *et al.*, 2004) for WY 1969-2003. This period was chosen based on consideration of available years of record, consistency for comparison to other sites, and the Del Valle Reservoir, which was completed in September, 1968.

hydrology on the sycamores' health and are coordinating to find a solution to their decay. Preliminary findings of coordinated hydrologic and dendrochronological analyses (Sycamore Associates, 2004) have not yet identified a causal link between sycamore health and environmental variables such as tree-ring chronology, temperature, precipitation, or stream flow characteristics. Project R.4-1 also includes the South Tributary (**Figure 2-5; see Chapter 2, Project Description**), a small tributary that feeds into Arroyo del Valle just downstream of the Sycamore Grove Park. The South Tributary watershed is approximately 1.6 percent the size of the watershed draining to Del Valle Reservoir and, in general, the South Tributary exhibits morphology fairly typical of a small, alluvial stream. The South Tributary's headwaters are located within sandstone and gravel units that make up the hills towards the south and southwest of Arroyo del Valle (Graymer *et al.*, 1997).

Reach 7 consists of the remainder of Arroyo del Valle (from Highway 84 downstream to its confluence with ADLL). Projects R.7-1 and R.7-2 include the Chain of Lakes A through D and the Shadow Cliffs recreation area, respectively. Project R.7-3 comprises just over two miles of lower Arroyo del Valle (to the confluence with ADLL). The channel banks are very steep and the channel depth is relatively deep in much of lower Arroyo del Valle.

Arroyo las Positas Watershed

Prior to its confluence with Arroyo Mocho, Arroyo las Positas drains approximately 80 square miles in the northeast portion of the Alameda Creek watershed, consisting of a broad alluvial plain and gently sloped upland areas. The Arroyo las Positas watershed is comprised of a number of tributaries included in the SMMP project area: Arroyo Seco, Altamont Creek, Cayetano Creek, Collier Creek, and Cottonwood Creek. The watershed is characterized by heavily incised channels through mainly commercial, agricultural, and ranch lands. All channels in this watershed are either flood control channels or natural channels traversing heavily grazed grasslands. The predominant substrate size is fine silts and riparian vegetation is essentially non-existent. Base flows in these channels are generally low and dependant upon releases from the Lawrence Livermore National Laboratory (Gunther *et al.*, 2000).

Arroyo las Positas flows primarily east to west through the City of Livermore, including the Las Positas Golf Course. The main-stem parallels I-580 through the City of Livermore. Channel capacity and flooding are serious issues in the lower, flat gradient reach of Arroyo las Positas near its confluence with Arroyo Mocho. The 100-year discharge for the lower portion (i.e., the approximately 4 mile stretch upstream of the confluence with Arroyo Mocho) of Arroyo las Positas is estimated at 10,100 cfs (Schaaf & Wheeler, 2000) while, due to excess sedimentation and the size of the natural channel downstream of Airway Boulevard and through the Las Positas Golf Course, the existing channel capacity in this reach is estimated to be only 1,800 cfs (West Yost & Associates, 2002).

Reaches 1, 2, and 5 are within the Arroyo las Positas watershed. Reach 12 drains into San Joaquin County and is not within the Arroyo Seco watershed. Reach 1 (Projects R.1-1 through R.1-7) includes Altamont Creek, Line S-1, Line R1-1, a section of Arroyo las Positas downstream to its confluence with Cayetano Creek, and the Springtown Natural Community Reserve. Most

channels in this reach serve as a conduit to convey SBA water to recharge areas further downstream. Within the Springtown Natural Community Reserve and further upstream, east of Vasco Road, Altamont Creek flows through a narrow, unimproved channel dominated by cattails, rushes, and sedges. There is a high salt concentration in the ground and surface water due to the geology of this area, which is principally composed of weathered marine shale. Sediment deposition occurs in Altamont Creek and in Arroyo las Positas upstream of the confluence with Altamont Creek. Sediment deposition is associated with vegetation debris in the upper reaches of Arroyo las Positas (Zone 7, 2006). Heavy down-cutting is evident on Arroyo las Positas in Projects R.1-6 and R.1-7 (downstream of Line S-1) and along I-580.

Reach 2 is highly urbanized and includes projects along Realigned Arroyo las Positas (R.2-1) and projects along Arroyo Seco (R.2-2 and R.2-3). The current 100-year floodplain extends beyond the stream banks of Realigned Arroyo las Positas, east of Lawrence Livermore National Laboratory (**Figure 2-4; see Chapter 2, Project Description**). West of LLNL, Realigned Arroyo las Positas has issues with high velocity and erosion (Zone 7, 2006). The adjacent banks of this linear earthen channel primarily support non-native annual grassland species such as bristly ox tongue (*Picris echioides*) and wild oats (*Avena fatua*). Similar instream and bank conditions exist at general project locations identified for Projects R.2-2 and R.2-3. Project R.2-2, which proposes floodwall construction and levee repair, is intended to allow Arroyo Seco to convey the 100-year flow under build-out conditions.

Reach 5 is located in the city of Livermore and includes Arroyo las Positas from just upstream of the Cayetano Creek confluence near I-580 to its confluence downstream with Arroyo Mocho. Arroyo las Positas runs through the Las Positas Golf Course in this reach. Arroyo las Positas and its tributaries in Reach 5 can be characterized into three categories: heavily grazed native streams (Cottonwood Creek, Collier Creek, and Cayetano Creek), channelized earthen trapezoidal channels that support dense cattail growth (Arroyo las Positas between I-580 and Airway Blvd.), and well-developed natural areas that support mature willow riparian habitat (Arroyo las Positas downstream from Airway Blvd). Due to grazing in Cottonwood Creek, Collier Creek, and Cayetano Creek, riparian vegetation is limited to sparse emergent wetlands, mainly cattails and sedges that line the water's edge.

Reach 12 contains the streams and drainages on the eastern side of the SMMP project area which drain into San Joaquin county. The reach is primarily rural and has no identified flooding problems. Eroded, sheer stream bed walls are a common feature in the upland region of Reach 12.

Arroyo las Positas differs widely upstream and downstream from Airway Boulevard, which separates the upstream maintained stream channel from natural areas in Arroyo las Positas Golf Course. Upstream from Airway Blvd and continuing to I-580, Arroyo las Positas is a wide flood control channel that is dominated almost exclusively by cattails. This stream is not channelized downstream from Airway Blvd, and supports an extensive and diverse willow riparian community within the Las Positas Golf Course.

The main issue along Arroyo las Positas is capacity (Zone 7, 2006). As mentioned above, the existing capacity through the Las Positas Golf Course (Project R.5-3) is approximately 1,800 cfs,

while the estimated design flow under buildout is approximately 10,100 cfs. Adding to the capacity problems are sedimentation problems upstream of the golf course. Just below I-580, near its confluence with Collier Creek, Arroyo las Positas is characterized by massive sedimentation. Sedimentation along Airway Boulevard has resulted in a significant reduction in the channel capacity in this area. There is moderated recharge over the length of Arroyo las Positas in this reach and it continues to act as a conduit for conveyance of SBA water to Arroyo Mocho.

Arroyo Mocho Watershed

Prior to its confluence with Arroyo las Positas just downstream of the Chain of Lakes area, Arroyo Mocho drains approximately 50 square miles of a long, narrow northwest trending valley with relatively steep upland areas in the eastern portion of the Alameda Creek watershed. Arroyo Mocho flows east to west and northwest direction at the eastern edge of the SMMP project area (through the future Chain of Lakes), then turns in a southwesterly direction west of El Charro Road and continues approximately three miles to its confluence with near I-680. The channel is trapezoidal in shape with levees along most of its length within the SMMP project area. As summarized by Zone 7 (2001), the lower reach of Arroyo Mocho, between Alamo Canal and Santa Rita Road, has been subject to much deposition and a resulting decrease in channel capacity. Originally, the channel section had a bottom width of about 60 feet; today, the bottom width is approximately 16 feet with a small, incised channel approximately 2 to 3 feet deep and 5 to 10 feet wide (Zone 7, 2001). The reach between Stoneridge Drive and the western edge of Staples Ranch has been widened to 60 feet at the channel bottom and 160 feet bank to bank. Arroyo Mocho between the confluence of Arroyo las Positas and El Charro Road has also been widened as part of *Arroyo Mocho Widening / Arroyo las Positas Realignment Project*.

Runoff records provide information on the characteristics of flow in the Arroyo Mocho watershed. Mean annual runoff for WY 1969-2001 was approximately 2.2 inches.⁵ This is comparable to earlier estimates of natural runoff for this area (Rantz, 1974). The runoff records demonstrate the variable (perennial vs. ephemeral) nature of daily flow, with a mean daily flow of 6.3 cfs and a median daily flow of 0.4 cfs. High variability in precipitation typically results in high inter-annual flow variability as well.

SMMP Reaches 3 and 6, and a portion of Reach 8 are located within the Arroyo Mocho watershed. Reach 3 extends upstream from Stanley Boulevard, consisting of the portion of Arroyo Mocho between the Chain of Lakes and the SBA turnout. The current FEMA 100-year floodplain in this reach is primarily located within the Chain of Parks area, but also extends downstream near Valley Memorial Hospital. Through the city of Livermore, Arroyo Mocho is an urban stream with areas of rock gabion, riprap, and concrete slopes constraining the channel; however, some fairly natural segments in this area contain gravel and cobble stream substrates (Gunther et al., 2000). Sedimentation, gravel transport, and deposition are serious issues along Arroyo Mocho. Gravel deposition at Holmes Street and Stanley Boulevard bridges has resulted in capacity issues at these two locations. Arroyo Mocho is an important source of groundwater recharge in Zone 7, particularly between Robertson Park and the Chain of Lakes area as it is part

⁵ All runoff estimates were derived from recorded surface water data for USGS Gage no. 11176000, as reported online: <http://waterdata.usgs.gov/ca/nwis/sw>

of the Zone 7 Artificial Stream Recharge Program. Because of this important function, protection of the function and quality of Arroyo Mocho's water is a priority.

SMMP Reach 6 is centrally located in the SMMP project area and flows through the area known as the Chain of Lakes. This portion of Arroyo Mocho is ephemeral. The majority of this reach is located within the FEMA 100-year floodplain and flooding issues are a priority in Reach 6. Arroyo Mocho has a gravel deposition problem through much of the reach, significantly limiting the channel capacity, and bed load removal and management are needed. Arroyo Mocho along this reach is crucial for groundwater recharge and surface water storage and is part of the Zone 7 Artificial Stream Recharge Program. Some of the lakes in the Chain of Lakes will be used principally for groundwater recharge, as the permeable soils of the sides of the lakes allow for lateral seepage and efficient recharge of groundwater. Other lakes will be used primarily for conveyance and storage; for example, recharge is not feasible at Cope Lake because the silt at the bottom of that lake inhibits significant infiltration of water from Cope Lake into the groundwater table.

SMMP Project R.8-3 comprises the lower section of Arroyo Mocho, from the Chain of Lakes downstream to its confluence with ADLL. Flood protection in the lower portion of this reach is a major concern, as sedimentation is prevalent along this reach and decreased channel capacity is a concern. This reach is not an integral area for water supply or aquifer recharge. Sediment removal could significantly increase channel capacity and functionality for conveyance of flood flows along this section of Reach 8.

Alamo Creek / Alamo Canal Watershed

Alamo Canal

Alamo Canal is a flood-control channel that flows to the southeast in the project area. The creek channel originates north of I-580 as Alamo Creek, which drains Dougherty Valley. Alamo Creek becomes Alamo Canal in the vicinity of Dublin Boulevard. Water drains to the canal from creeks to the west, including Dublin Creek, and from South San Ramon Creek to the north, which connects to the canal near Dublin Boulevard. The active stream bed is about 20 feet wide, and the stream meanders within this area. Alamo Canal flows into the ADLL near the southwest border of the City of Pleasanton. SMMP Reach 9 is located within the Alamo Canal drainage area.

SMMP Reach 9 includes Alamo Canal and a number of tributaries draining into Alamo Canal (Line G-1-1, Lines F-4 and F-6, Alamo Creek, South San Ramon Creek, and Lines J-1 to J5). Flood issues are limited in Reach 9, however, erosion and sedimentation issues are present in Reach 9. Noticeable areas include Alamo Canal and South San Ramon Creek near its confluence with Alamo Creek. This reach is not an integral area for water supply or aquifer recharge. The waterways in Reach 9 are not classified as having impaired water quality.

South San Ramon Creek

South San Ramon Creek originates in Watson Canyon north of the project area and drains the southern San Ramon and Dublin areas. Within the project area, the creek has been channelized

adjacent to the abandoned Southern Pacific Railroad right-of-way. This creek receives stormwater runoff from developed areas in the San Ramon Valley. South San Ramon Creek discharges to the Alamo Canal.

Tassajara Creek Watershed

Within the project area, Tassajara Creek is channelized and flows in a southwest direction through the Tassajara Valley, draining approximately 27 square miles of the northern hills down to its confluence with Arroyo Mocho. North of I-580, Tassajara Creek is a losing stream, that is, water flows from the creek, infiltrating the surrounding groundwater basin at a rate of approximately 1.35 cfs. Project R.8-1 covers an approximately three-fourth mile stretch of Tassajara Creek north of I-580. South of I-580 Tassajara Creek is a gaining stream, with flow from the shallow groundwater aquifer discharging into the stream.

Additional SMMP Project Area Drainages

Chabot Canal

Chabot Canal is a grass lined, trapezoidal channel conveying runoff from four square miles north of I-580 south to Arroyo Mocho. Project R.8-2 includes the entirety of Chabot Canal. Chabot Canal drains into the lower portion of Arroyo Mocho just upstream of Hopyard Road.

Pleasanton Canal

This channel is an earth-lined trapezoidal flood control channel that parallels the Arroyo Mocho. The channel consists of both open canal and culverted sections. It flows in a southwest direction and empties into the ADLL. The channel bed is approximately 20 feet wide.

Flooding, Erosion, and Sedimentation Concerns

Regional flood protection in the Livermore-Amador Valley is the primary component of proposed SMMP projects related to surface water hydrology. Typical areas of flooding include the Chain of Lakes, Arroyo Mocho near Valley Memorial Hospital, Alamo Canal near I-580, Chabot Canal upstream of I-580, and lower ADLL. The Valley has experienced sedimentation problems throughout the network of stormwater conveyance and drainage facilities. As the Livermore-Amador Valley continues to transform from rural to suburban land uses, significant increases in both peak runoff and runoff volume are predicted for most of the principal creeks and arroyos in the SMMP project area. These predicted increases are a result of: 1) increase in area of impervious surfaces, 2) loss of natural floodplains, and 3) conversion of natural arroyos into trapezoidal channels. These changes are predicted to result in about 50 percent increase in peak runoff by General Plan build-out of the Livermore-Amador Valley (likely by 2030). Furthermore, encroachment of growth and development onto historic floodplains has exacerbated the risk of flood damage. Most of the flood protection studies conducted within the Zone 7 service area have recognized the linkages between peak flows in the upstream and downstream arroyos, and the importance of evaluating the timing of the peaks for each arroyo.

Increased runoff and flood flows have transported and deposited more sediment on low lying areas of the Livermore-Amador Valley. Once aggradation begins, arroyos typically adjust by eroding banks and widening, as the more frequent moderate- and low-flows cannot remove or rework sediment deposited in the channel (Meyer, 1989). With progressive bank erosion, high-flow channel width increases, depth decreases, and channel conveyance capacity is thus compromised.

To help direct focus of the relevant SMMP projects, the regional flood protection review has identified three major physical challenges to implementing a regional flood protection solution:

- Major arroyos are under capacity;
- Sediment accumulation further restricts arroyo capacity; and
- Expanding existing trapezoidal channels is not viable.

Flooding and Floodplains

A number of studies have been conducted related to flood control and flood channel design in the Livermore-Amador Valley. The following are cited and summarized in Zone 7 (2006):

- Upper Alameda Creek Urban Study, U.S. Army Corps of Engineers, 1985
- Flood Insurance Study, Federal Emergency Management Agency, 1997
- Hydrologic Procedures and Design Discharges Report, Schaaf & Wheeler, 1997
- Conceptual Alternatives Analysis for Arroyo de la Laguna, McKay & Soms, 1998
- Update of Channel Improvement Costs, Schaaf & Wheeler, 2000
- Draft Flood Control Master Plan, West Yost & Associates, 2001
- Draft Technical Memorandum SMMP Phase 2, Task 1.4: TM No. 4 – Arroyo de la Laguna Hydraulic Grade Line Analysis, RMC, 2004

Because of the predicted increase in runoff and the resulting increase in magnitude of the 100-year design storm associated with buildout within the SMMP project area, many of the existing capacities of local arroyos have been deemed inadequate for future flood flows (Schaff & Wheeler, 2000; West Yost & Associates, 2002). The largest current floodplain areas, and thus the areas of primary concern under future runoff conditions, include areas draining to Chabot Canal upstream of I-580 and Alamo Canal adjacent to the I-580 and I-680 crossing, and the Chain of Lakes and the Las Positas Golf Course areas.

Sedimentation

Sediment accumulation further restricts arroyo capacities. As the drainage areas in the SMMP project area have adjusted to changes over time, Zone 7 has experienced sedimentation problems throughout their network of flood control channels. The dominant supply of sediment to the channels comes from Holocene alluvial fans in the Arroyo Mocho and Arroyo las Positas watersheds, located in narrow valleys of the upper portions of these arroyos (Zone 7, 2006). Other significant sediment sources are landslides and stream bank failures.

Because sedimentation is such a concern, RMC (2004a) conducted a sediment budget analysis to assess, at a planning level, the existing conditions of, and the potential effect of SMMP flood

management recommendations on, the overall sediment yield at the outlet of ADLL. RMC (2004a) analyzed five scenarios in terms of development and channel conditions. Under existing channel capacity conditions, the areas prone to flooding are Arroyo las Positas through the Las Positas Golf Course (estimated current capacity of 1,800 cfs) and Arroyo Mocho through the Chain of Lakes area (estimated current capacity of 900 cfs). The estimated design flows⁶ for these two areas are more than five times greater than the current capacity. The analysis was broken into two components based on the origin of sediment: wash load (in this case, that part of the overall sediment load generated from hill slopes and delivered to the channel) and bed load (that part of the sediment load entrained via bed scour within the channel). The sediment budget analysis is further described under Hydrology and Water Quality Impacts and Mitigation Measures, below.

Water Supply and Groundwater Management

Zone 7 conjunctively manages the Main Groundwater Basin (Main Basin) of the Livermore-Amador Valley by implementing an annual and long-term water operation plan designed to maintain a sustainable water supply and groundwater quality. During non-drought periods, Zone 7's operational practice is to maintain an equal balance of recharge and pumping, as well as to maintain sufficient managed storage for use during a multi-year drought. Zone 7 seasonally uses approximately 15,000 to 20,000 af of storage capacity (including retailer contractor groundwater pumpage). This practice has the objective of preserving up to 240,000 af of groundwater to provide peaking, drought year, and emergency storage. This amount is limited by Zone 7 water supply agreements with its retailers that include provisions limiting annual pumpage by these agencies to a total of 7,245 acre feet per annum (afa), broken down as follows: City of Pleasanton, 3,500 afa; DSRSD, 645 afa; California Water Services, 3,069 afa; and City of Livermore, 31 afa. Additionally, groundwater levels are also maintained in accordance with agreements with gravel mining operations within the Chain of Lakes area. Through Zone 7's long-term conjunctive use management, groundwater levels within the Main Basin have been restored from historical overdraft conditions that occurred in the 1960s, when only approximately 126,000 af of groundwater remained in storage in the Main Basin. This 126,000 af storage level corresponds to groundwater levels identified by Zone 7 as the "historic low" and provides the foundation for Zone 7's current operational practice, which is to maintain groundwater levels above historic lows.

Zone 7 implements conjunctive use on an annual basis through 1) artificial recharge of the Main Basin through releases of imported State Water Project supplies to Arroyo Mocho and Arroyo del Valle from the SBA; and 2) subsequent recovery of stored groundwater through extractions from seven existing wells within the City of Pleasanton. The current Valley-wide municipal well peak pumping capacity is approximately 53 million gallons per day (mgd), which includes both Zone 7's instantaneous peak pumping capacity (32 mgd) and Retailer Agency (21 mgd) peak well production capacity. Zone 7's sustainable capacity, or the capacity that could be pumped for a longer than 24-hour period to meet either drought year or emergency demands, is 25 mgd.

⁶ The design flow refers to the predicted 100-year flow under build-out conditions, these were summarized in *Draft Technical Memorandum SMMP Phase 2, Task 1.4: Project Refinements* (RMC, 2004).

The safe yield of the Main Basin is 13,400 af annually. From this safe yield, the Valley retailers are permitted to pump 7,200 af annually. This amount is limited by Zone 7's water supply contracts with each retailer. The balance of the safe yield is pumped for other municipal, agricultural, and gravel mining uses. Zone 7's pumpage for treated water deliveries does not use the natural safe yield of the Main Basin; rather its pumpage is less than the amount of water recharged and stored as part of its conjunctive use operations. Zone 7 implements a flexible, adaptive groundwater management program based on each year's hydrologic conditions (which determines the supply) and demand. Although the amount Zone 7 recharges and recovers may not balance in any given year, over the long term, the amount artificially recharged exceeds the amount pumped from the Main Basin. Between 1974 through 2003, the amount artificially recharged totaled 137,694 af, of which 76,903 af was recovered by Zone 7. To the extent feasible, Zone 7 maintains a full groundwater basin. Based upon the adopted General Plans within the Zone 7 service area, treated water demands are projected to increase to 68,960 afa by 2020. As demands increase over time, Zone 7 will need additional well capacity to recover stored groundwater at rates that will meet this projected demand within the context of its reliability goals.

Water Quality

In accordance with state policy for water quality control, the San Francisco Bay Regional Water Quality Control Board (RWQCB) employs a range of beneficial use definitions for surface waters, groundwater, marshes, and mudflats that serve as the basis for establishing water quality objectives and discharge conditions and prohibitions. The San Francisco Bay RWQCB has identified existing and potential beneficial uses supported by the key surface water drainages throughout the Bay Area in the San Francisco Bay Basin Water Quality Control Plan (1995 Basin Plan). The beneficial uses designated in the Basin Plan for the creeks and arroyos in the SMMP project area are identified in **Table 3.2-1**. The beneficial use categories are defined in **Table 3.2-2**. The 1995 Basin Plan also developed water quality objectives for each of the identified beneficial uses. The water quality objectives relevant to the SMMP relate to total dissolved solids (TDS) and chloride and are provided in **Table 3.2-3**. The objectives are set to protect the beneficial uses.

Furthermore, under Section 303(d) of the 1972 Clean Water Act, the State of California is required to develop a list of quality impaired water bodies that do not meet water quality standards. A first list of impaired water bodies was established in 1998 and has recently been updated to include diazinon, a pollutant resulting from urban runoff that has been identified in most of Zone 7's streams. In addition to diazinon, other pollutants of concern are identified for Central San Francisco Bay. These pollutants need to be addressed in Zone 7's streams because of their impact on downstream waters discharging into San Francisco Bay (Zone 7, 2006). Such pollutants include mercury, copper, selenium, dioxins, polychlorinated biphenyls (PCBs) and other pesticides. **Table 3.2-4** provides a list of impaired streams in the project area with corresponding pollutants of concern.

**TABLE 3.2-1
ALAMEDA CREEK BASIN**

Waterbody	Agricultural Supply	Cold Freshwater Habitat	Ground-water Recharge	Fish Migration	Municipal and Domestic Supply	Water Contact Recreation	Non-Contact Water Recreation	Fish Spawning	Warm Fish Habitat	Wildlife Habitat
Alameda Creek	E	E	E	E		E	E	E	E	E
Alameda Creek Quarry Ponds		E	E			E	E		E	
Arroyo Mocho										
Tassajara Creek										
Shadow Cliffs Reservoir		E				E	E	E	E	E
Arroyo del Valle		E	E	P	E	P	P	E		E
Arroyo Seco (Alameda)										

E = existing beneficial use
P = potential beneficial use

SOURCE: RWQCB, 1995

3.2.2 Regulatory Framework

Consistency with County and Local Regulations, Goals, and Policies

Alameda County and the Cities of Pleasanton and Livermore identify goals and policies in their General Plans that protect surface water resources within individual jurisdictions. The policies relevant to the SMMP project area intended to protect creeks and water quality are presented in **Appendix 3.2**. The SMMP is consistent with these goals and policies of the affected jurisdictions.

Water Quality Regulation

Regulatory authorities exist on both the state and federal levels for the control of water quality in California. The U.S. Environmental Protection Agency (USEPA) is the federal agency responsible for water quality management under the Clean Water Act. An EPA regional office (EPA Region IX) is located in San Francisco and delegates authority for waste discharge permitting to the State Water Resources Control Board (SWRCB).

The SWRCB is the agency with jurisdiction over water quality issues in the State of California. The SWRCB is governed by the Porter-Cologne Water Quality Act (Division 7 of the California Water Code), which establishes the legal framework for its water quality control activities.

**TABLE 3.2-2
DEFINITIONS OF BENEFICIAL USES OF SURFACE WATERS**

Beneficial Use	Description
Agricultural Supply	Uses of water for farming, horticulture, or ranching.
Areas of Special Biological Significance	Preservation and enhancement of areas (i.e., marine life refuges, ecological reserves) designated by the State Water Resources Control Board.
Cold Freshwater Habitat	Uses of water that support cold water ecosystems, including the preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife.
Ocean, Commercial, and Sport Fishing	Uses of water for commercial or recreational collection of fish, shellfish, or other organisms for human consumption or bait purposes.
Estuarine Habitat	Uses of water that support estuarine ecosystems, including the preservation or enhancement of habitat and biota.
Freshwater Replenishment	Uses of water for natural or artificial maintenance of surface water quantity or quality.
Groundwater Recharge	Uses of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting saltwater intrusion into freshwater aquifers.
Industrial Service Supply	Uses of water for industrial purposes that do not depend on water quality, including cooling water supply, fire protection, mining, gravel washing, etc.
Marine Habitat	Uses of water that support marine ecosystems, including preservation or enhancement of habitats and biota.
Fish Migration	Uses of water that support habitat for aquatic organisms that are temporary inhabitants, including anadromous fish. Maintenance of zones of passage free from physical or chemical barriers is important to this use.
Municipal and Domestic Supply	Uses of water for community, military, or individual water supply systems, including drinking water supply.
Navigation	Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.
Preservation of Rare and Endangered Species	Uses of waters that support habitat for rare or endangered plant and animal species.
Water Contact Recreation	Uses involving body contact with water, where ingestion of water is reasonably possible, including swimming, wading, water skiing, windsurfing, and diving.
Noncontact Water Recreation	Uses involving proximity to water, not normally including water contact, such as picnicking, sunbathing, hiking, beachcombing, camping, boating, sightseeing, and nature studies.
Shellfish Harvesting	Uses of water that support habitats suitable for collection of crustaceans and filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption. Water quality (levels of bacteriological pathogens, trace elements, natural toxins) of overlying waters is a significant concern.
Fish Spawning	Uses of water that support high-quality aquatic habitats suitable for reproduction and early development of fish.
Warm Freshwater Habitat	Uses of water that support warm water ecosystems, including the preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife.
Wildlife Habitat	Uses of waters that support wildlife habitats, including preservation of vegetation, prey species, and water quality.

SOURCE: RWQCB, 1995

**TABLE 3.2-3
SURFACE WATER QUALITY OBJECTIVES, ALAMEDA CREEK AND TRIBUTARIES**

TDS	250 mg/L (90-day arithmetic mean) 360 mg/L (90-day 90th percentile) 500 mg/L (daily maximum)
Chlorides	60 mg/L (90-day arithmetic mean) 100 mg/L (90-day 90th percentile) 250 mg/L (90-day daily maximum)

Note: mg/L = milligrams per liter

SOURCE: RWQCB, 1995

**TABLE 3.2-4
2002 CWA SECTION 303(D) LIST^a OF WATER QUALITY LIMITED SEGMENTS**

Name	Pollutant/Stressor	Source	TMDL Priority	TMDL Completion Date
Arroyo Las Positas	Diazinon	Urban Runoff/Storm Sewers	High	2005
Arroyo Mocho	Diazinon	Urban Runoff/Storm Sewers	High	2005
Arroyo del Valle	Diazinon	Urban Runoff/Storm Sewers	High	2005
Arroyo de la Laguna	Diazinon	Urban Runoff/Storm Sewers	High	2005
Alameda Creek	Diazinon	Urban Runoff/Storm Sewers	High	2005
Del Valle Reservoir	Mercury*, PCBs*	Non-point Source	-	-
Shadow Cliffs Reservoir	Mercury*, PCBs*	Non-point Source	-	-
Central San Francisco Bay	Mercury	Non-point Source	High	2006
	PCBs	Non-point Source	Medium	2006
	Dioxins	Non-point Source	High	2005
	Copper	Several	Medium	2008
	Pesticides	Non-point Source	Low	-
	Selenium	Several	Low	2010
	Furan	Atmospheric	High	2003

^a USEPA approved listing as of July 2003

* Mercury and PCBs listings are proposed for Del Valle and Shadow Cliffs Reservoirs in the October 2005 Draft List of Water Quality Limited Segments.

SOURCE: Zone 7, 2006

Much of the implementation of the SWRCB's responsibilities is delegated to the nine Regional Water Quality Control Boards (RWQCB).

The San Francisco Bay RWQCB is responsible for the protection of the beneficial uses of the San Francisco Bay and surrounding waters. The San Francisco Bay RWQCB uses planning, permitting, and enforcement authorities to meet this responsibility, and has adopted the San Francisco Bay Basin Water Quality Control Plan (Basin Plan) to implement plans, policies, and provisions for water quality management. The most recent revision of the Basin Plan was adopted by the San Francisco Bay RWQCB in June 1995 and was approved by the SWRCB in November 1995 (RWQCB, 1995).

Alameda Countywide Clean Water Program

Section 402 of the Clean Water Act requires the USEPA to administer the federal National Pollutant Discharge Elimination System (NPDES) permit regulations for certain discharges into navigable waters of the United States. The NPDES permit program manages the water quality of receiving waters by controlling and reducing the pollutants entering the surface water bodies from point and nonpoint discharges. In November 1990, the USEPA promulgated regulations (40 Code of Federal Regulations Part 122) that required municipalities and urban counties with separate storm drainage facilities which serve populations over 100,000 to obtain NPDES permits. The federal regulations also gave discretionary authority to the state administering agency (SWRCB) to require smaller municipalities to obtain NPDES permits.

In California, the NPDES Program is administered by individual RWQCBs. In the 1991 revisions to the Basin Plan, the RWQCB required that all municipalities, the counties, and the flood control and water conservation districts in Alameda and Contra Costa Counties cooperatively develop area-wide programs and submit coordinated Part 1 and Part 2 stormwater NPDES permit applications.

The Alameda Countywide Clean Water Program has been established in order to comply with the RWQCB's Basin Plan revisions adopted in 1991 and requirements of the federal Clean Water Act and other federal regulatory programs discussed above. The Program is a consortium of local agencies in Alameda County including: Alameda County (unincorporated area), Alameda County Flood Control and Water Conservation District, Zone 7, and the cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, Union City and San Leandro. The Alameda County Flood Control and Water Conservation District is responsible for administering the overall program. The Program participants worked jointly to prepare the *Storm Water Quality Management Plan (SWMP) for the Alameda Countywide Urban Runoff Clean Water Program, July 2001-June 2008* (July 2001). The goal of the Alameda Countywide Clean Water Program, as outlined in the SWMP, is to help local residents, businesses and municipalities meet the stormwater quality goals of the Clean Water Act.

For non-stormwater discharges, both exempted and conditionally exempted discharges need not be prohibited unless they are not identified as sources of pollutants to receiving waters or in the

latter case, if appropriate control measures to minimize the adverse impacts of such sources are developed and implemented under the Plan.

Construction Activity Permitting

The RWQCB administers the NPDES stormwater permitting program in the Bay Area. Construction activities of one acre or more are subject to the permitting requirements of the NPDES General Construction Permit for Discharges of Stormwater Runoff Associated With Construction Activity (General Construction Permit) (RWQCB, 2003). The project applicant must submit a Notice of Intent to the RWQCB to be covered by the General Permit prior to the beginning of construction. The General Construction Permit requires the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must be prepared before construction begins. The SWPPP would include specifications for Best Management Practices (BMPs) that would be implemented during project construction to control potential discharge of pollutants from the construction area. Additionally, the SWPPP would describe measures to prevent pollutants in runoff after construction is complete and reference a plan for inspection and maintenance of the project facilities. Implementation of the SWPPP starts with the commencement of construction and continues through the completion of the project. Upon completion, the applicant must submit a Notice of Termination to the San Francisco Bay RWQCB.

3.2.3 Hydrology and Water Quality Impacts and Mitigation Measures

Significance Criteria

Significance criteria, or thresholds, listed in Appendix G of the CEQA guidelines are used to determine the significance of potential impacts due to the proposed project. The project is not anticipated to have a substantial effect on depleting groundwater supplies or interfering substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. Furthermore, the project area is not subject to inundation by seiche, tsunami, or mudflow. These significance criteria are not relevant to the proposed project and therefore are not discussed hereinafter. Significance criteria in Appendix G of the CEQA guidelines that are pertinent to the project are listed below; according to these criteria a project would normally result in a significant hydrology and water quality-related impact if it would:

Water Quality

- Cause violations of effluent water quality limits.
- Cause or contribute to violations of ambient water quality objectives.
- Cause significant increases in mass loadings or otherwise substantially degrade water quality.

Flooding

- Exacerbate on- or off-site flooding problems.

Surface Water Drainages

- Substantially alter channel stability (erosion and/or sedimentation rates) through increases or decreases in discharge.
- Substantially alter the course of a stream or arroyo.

Impacts and Mitigation Measures

Construction Impacts

Impact 3.2.1. Erosion. Project construction could result in increased erosion and sedimentation, which could increase turbidity and decrease water quality in surface waterways. Less than Significant with Mitigation.

Runoff and/or concentrated erosion by water, if not managed or controlled, could result in channel instability (bed and bank erosion), sediment accumulation downstream (sedimentation), increased turbidity (degraded water quality), and aggravation of downstream flooding conditions. Most of the SMMP projects involve only short-term (i.e., within one season) construction activities, and thus the majority of potential impacts analyzed are only temporary in nature.

Most of the project area lies within the relatively flat, alluvial Livermore-Amador Valley, and compared to the uplands, precipitation does not run off hillsides as rapidly and infiltrates the soil more readily; thus, in terms of affecting flooding, runoff, and water quality, the on-stream construction activities are the primary concern. Project construction activities associated with the SMMP would include disruption of the bed and banks of local creeks and may directly affect water quality by temporarily increasing turbidity. SMMP projects that include substantial on-stream activities, as well as require extensive excavation and earthmoving activities, include diversion channels and related structures (i.e. drainback channels and overflow weirs), channel modification and widening, wetland creation, meandering channel creation, and sediment basins. Total project duration for such activities could range from approximately one month (in the case of the sediment basin) to three years (in the case of the widening of Arroyo las Positas and construction of the Arroyo las Positas diversion facility), with construction activities for multi-year projects taking place only during the construction season (i.e., in phases). Other on-stream activities, such as bank stabilization and vegetation planting would require significantly less excavation. Recreational trail construction would require minimal grading, paving, and other activities.

On-stream construction activities may pertain to one or all of the potential impacts. On-stream construction could impede flood flows by placing construction materials and personnel in the pathway of flowing water (flood flows). Also, an increase in the runoff rate from the construction area may result from temporarily decreasing the resistance to overland flow (i.e., clearing of native vegetation or on-slope grading), decreasing the infiltration capacity of the soil (i.e., compaction), or by increasing the velocity of runoff (i.e., concentrating flow into manmade rills

or gullies or other such structures/forms). Furthermore, all of these construction activities would require some degree of backfilling, earthmoving, grading, stockpiling and/or compaction, which may expose areas of soil, that have previously been covered with vegetation, to erosion. In this area, soil is eroded mainly by raindrop impact and overland surface runoff; depending on flow velocity, the eroded soil could be delivered to the channel or local waterways and thus contribute to sedimentation and degraded downstream water quality. Increasing runoff over soils that have been made more susceptible to erosion increases the likelihood that hillside or bank material will enter the channel. Furthermore, sediment entrained from the channel or hillsides and carried downstream would eventually also contribute to increased downstream sediment deposition, although the precise location may be less obvious. The extent of erosion that could occur varies depending on soil type, vegetation/cover, and weather conditions.

The minimum construction project acreage that would initiate the preparation of a SWPPP in accordance with the NPDES General Construction Activity Storm Water Permit requirements is one acre. Individual SMMP projects exceeding one acre would thus require submittal of a Notice of Intent to the San Francisco RWQCB. The SWPPP would be updated and implemented as each project is constructed. The SWPPP requires implementation of BMPs for erosion and sediment control. These include the use of fencing, water detention structures, baker tanks, and other control measures that would limit construction-related storm runoff. Preparation of the SWPPP and compliance with the measures identified in the SWPPP would ensure Zone 7 is in compliance with state regulatory policies in addition to minimizing the potential for water quality impacts from construction activities (**Mitigation Measure 3.2.1a**).

As described briefly above, Alameda County SWMP provides performance standards for new development and construction site controls. These standards are applicable to all phases of construction, including clearing, grading, and excavation that results in a cumulative disturbance of 10,000 or greater square feet of land that would discharge stormwater to the municipally-owned storm drain system (Alameda County, 2001). Zone 7 is a member agency of the Alameda Countywide Clean Water Program, and therefore would comply with the goals and policies of the SWMP. Zone 7 would implement BMPs that would be based on the Stormwater Quality Task Force's *California Storm Water Best Management Practices Handbook* (2003) or other comparable guidance regarding BMPs or erosion and sedimentation control. The *Best Management Practices Handbook* outlines a variety of BMPs that would minimize stormwater runoff during construction activities, and include hazardous waste management, vehicle and equipment maintenance, employee/subcontractor training, planting and reseeding, installation of geotextiles and mats, installation of silt fence and other barriers, construction road stabilization, and storm drain protection. Other BMPs that would be necessary to control sediment include the use of baker tanks or other desiltation containment to filter sediments prior to discharge at the drilling site. These BMPs may also be incorporated into a project's SWPPP (see above) as needed. Implementation of **Mitigation Measure 3.2.1b**, limiting in-channel construction to the dry season (May 1 through October 15), would further reduce the potential for increased erosion and sedimentation from on-stream construction activities.

The implementation of **Mitigation Measure 3.2.1a**, including but not limited to temporary sand bagging, use of hay rolls or silt fences, construction of berms, installation of geofabric, and use of

baker tank or desilting ponds, in addition **Mitigation Measure 3.2.1b** would ensure potential impacts associated with degradation of water quality from construction activities would be reduced to less-than-significant impacts. In addition, mitigation measures recommended in **Section 3.10, Hazards and Hazardous Materials**, would reduce the potential impacts associated with accidental release of hazardous materials to affect water quality.

Mitigation Measures

Mitigation Measure 3.2.1a: Zone 7 shall submit an NOI to the RWQCB to comply with the NPDES Construction Activity Storm Water Permit requirements. Zone 7 or its contractors shall prepare and implement a SWPPP for individual projects prior to project construction.

Preparation of the SWPPP shall be the responsibility of Zone 7, and implementation of the SWPPP shall be the responsibility of the contractor hired to perform the work. The SWPPP shall incorporate construction BMPs. Typical BMPs in the SWPPP could include, but would not be limited to the following:

- Prior to any excavation, determine whether the depth and extent of excavation would likely encounter contaminated soils and groundwater.
- Retain, protect and supplement native vegetation wherever possible. Exposure of soil areas shall be limited to the immediate area required for construction operations.
- Grading areas should be clearly marked and no equipment or vehicles shall disturb slopes or drainages outside of the grading area.
- Use barriers to contain runoff around excavation sites.
- If unreported contaminated soil is encountered during excavation, carry out appropriate remediation of soils in contained areas or covered areas, or remediated through treatment prior to initiating excavation.
- Filter runoff onsite using silt fences, desiltation ponds, baker tanks, and other appropriate control measures.
- Install temporary (or permanent) stormwater retention or detention structures in which treatment can occur.
- No stockpiling of excavated soil or other materials shall occur in stream channels. No excavated soil or other materials shall be disposed of instream channels, but should be hauled away for proper disposal. Care should be taken to ensure that pollutant spills do not occur in stream channels. For example, changing of oil or other fluids should not be performed in the vicinity of stream channels.
- Use tarps to cover any excavation soils storage during the October-April rainy period.
- After completion of slope grading, erosion protection shall be provided and must include slope planting. Revegetation shall be facilitated by mulching, hydroseeding or other methods, and shall be initiated as soon as possible after completion of grading, and prior to November 1st. Improvement of slopes shall involve ground

coverings. Selection of plant materials shall consider native plantings and shall encourage shrubs and trees as a long-term erosion control feature.

The SWPPP shall be kept onsite during construction activity and made available upon request to a representative of the RWQCB. Zone 7's contractor shall conform to the contract specifications addressing stormwater pollution prevention and shall follow all BMPs identified in the project SWPPP at all times during construction.

Mitigation Measure 3.2.1b: In order to reduce the potential for erosion and sedimentation, on-channel construction shall be limited to the dry season annually, from April 15th to October 15th, subject to agreement and permit issuance from appropriate regulatory agencies.

Impact Significance after Mitigation: Less than significant.

Impact 3.2.2. Dewatering. Construction activities for the SMMP could include dewatering, that could result in the discharge of turbid waters into the local storm drain systems or nearby creeks and arroyos. Such a discharge would result in potentially significant impacts. Less than Significant with Mitigation.

Construction activities may require dewatering operations to lower surface water levels to facilitate excavations, with subsequent discharge of groundwater to surface waters. Discharge of turbid waters into the storm drains or creek systems with subsequent discharge back into the stream would constitute a potentially significant impact. Baker tanks may be used as desiltation devices to settle out sediments prior to discharge. All discharges would comply with SWPPP requirements to reduce the potential for water quality degradation of receiving waters. Implementation of **Mitigation Measures 3.2.1a**, preparation and implementation of a SWPPP would reduce potential impacts associated with degradation of water quality from dewatering activities to less-than-significant levels.

Mitigation Measures

Implement **Mitigation Measure 3.2.1a**.

Impact Significance after Mitigation: Less than significant.

Impact 3.2.3. Increased Storm Runoff. Construction of individual projects, particularly trail construction, would result in a minor increase in local storm runoff volumes. Less than Significant impact.

The SMMP is proposed in order to provide adequate regional storage capacity during a 100-year storm event. The majority of projects constitute in-channel or adjacent to channel improvements that would not include large amounts of impervious surface area. However, certain features proposed under the SMMP would increase impervious surfaces, with corresponding increase in

runoff generation during rainfall event. Implementation of the SMMP would include construction of over 40 miles of paved recreation trails throughout the Zone 7 service area. Due to their linear nature with an estimated impervious surface width of less than 25 feet, recreational trails do not typically generate high volumes of runoff, and appropriate design and proximity to conveyance channels would minimize potential impacts to a less-than-significant level.

Long-term Operational Impacts

Impact 3.2.4. Sediment Transport: Implementation of the SMMP would not significantly alter the total volume of sediment transported from the upper Alameda Creek watershed and discharged to Alameda Creek via ADLL. Moreover, implementation of the SMMP would beneficially sequester fine sediments (i.e., silts and sands) by directing flows to retention at Cope Lake and Lake G (part of the Chain of Lakes) during 7-year or less frequent storm events; this is expected to be beneficial in terms of potential water quality impacts. Less than Significant; Beneficial Impact.

In order to better understand the sediment characteristics of the SMMP project area, RMC (2004a) conducted a planning level sediment budget analysis to assess the existing sediment yield at the outlet of ADLL (i.e., the confluence of ADLL and Alameda Creek) and to estimate future sediment yields associated with build-out conditions. In general, the total sediment yield is similar under future conditions with or without SMMP implementation, the principle difference is in the management of the future sediment loads. Without SMMP implementation, sediment transported during a large event would be deposited onto the floodplain when the flow overtops the channel banks; with SMMP implementation, the sediment would be sequestered in Cope Lake when water is diverted here during flood events for the areas upstream of the Chain of Lakes.

RMC (2004a) analyzed five scenarios in terms of development and channel conditions; the three scenarios of relevance are: 1) existing conditions, 2) full build-out⁷ with existing channel capacity, and 3) full build-out with SMMP implemented improvements. Under existing channel capacity conditions, the areas prone to flooding are Arroyo las Positas through the Las Positas Golf Course (estimated capacity of 1,800 cfs) and Arroyo Mocho through the Chain of Lakes area (estimated capacity of 900 cfs). The estimated design flows⁸ for these two areas are more than five times greater than the current capacity. The analysis was broken into two components based on the origin of sediment: wash load (in this case, that part of the overall sediment load generated from hill slopes and delivered to the channel; typically finer grains such as silts and sands) and bed load (that part of the sediment load entrained via bed scour and moved within the channel; typically coarser grains such as gravels and cobbles).

The average annual wash load derived from the various project-area watersheds was estimated using the Pacific Southwest Inter-Agency Committee Method (PSIAC, 1968). This methodology

⁷ This land-use scenario reflects full build-out as outlined by the Urban Growth Boundary presented in general plans for the Cities of Dublin, Pleasanton, Livermore, San Ramon and the County of Alameda (RMC, 2004).

⁸ The design flow refers to the predicted 100-year flow under build-out conditions, these were summarized in the *Draft Technical Memorandum SMMP Phase 2, Task 1.4: Project Refinements* (RMC, 2004).

estimates sediment loading by rating (numerically) the condition of the watershed in terms of nine watershed factors: surface geology, soils, climate, runoff, topography, ground cover, land use, upland erosion, and channel erosion and sediment transport. The watershed area drained by Arroyo del Valle was not included in the analysis because it was assumed that all sediments eroded from the upland watershed would be trapped in Del Valle Reservoir. Similarly, the Chain of Lakes area was not included in the analysis since it was assumed that eroded soils would be trapped in the gravel mining pits and would therefore not contribute to the wash load.

The quantity of bed load entrained and transported through the channel, under the same three scenarios, was determined using a sediment transport capacity relationship developed by Ayres Associates (2001).⁹ The main channels¹⁰ were broken into relatively homogeneous reaches for purposes of modeling, and the bed load equation was used to determine the amount of bed load sediment transported into each reach (supply) and the amount transported out (reach capacity). Using the principles of continuity and conservation of mass, the change in volume (aggradations vs. degradation) was determined for each reach until the sediment was routed to the outlet point where ADLL drains into Alameda Creek. Bed load transport was modeled using the 2-year and 100-year runoff events.

Table 3.2-5 presents the results of the planning-level sediment budget analysis. When compared to existing conditions, total sediment yield is estimated to remain static (or to be slightly reduced) under build-out flow conditions. This is because wash load (expressed as yards per year [yards/year]) is predicted to decrease while bed load yield (expressed as yards per 2-year or 100-year storm event [yards/2-yr event or yards/100-yr event]) is predicted to increase under future conditions, and so there is little to no discernible net change in the overall sediment yield. Wash load production, as calculated, depends solely on the characteristics of the surrounding hill slopes; it is expected to decrease because future development will replace erodible, natural hill slopes with non-erodible surfaces. Bed load production depends largely on the magnitude of flood flows; it is expected to increase because higher peak flows, and thus higher stream power, are predicted under future development conditions. Therefore, although increased development would have occurred within the Livermore-Amador Valley at build-out thereby decreasing the wash load yield, the total volume of sediment yield from the watershed would remain essentially unchanged under future conditions due to a corresponding increase in bed load yield. Similarly, the increment of sediment management that is provided by the SMMP is not anticipated to affect overall sediment yield to Alameda Creek from ADLL. Although the total sediment yield is not expected to change, regardless of SMMP implementation, the size distribution of the total sediment yield is expected to change (i.e., the bed load component is expected to increase).

⁹ This methodology utilized regression analysis, the Meyer-Peter and Muller bed load equation, and the Zeller and Fullerton Power Function Relation.

¹⁰ Due to data limitations on channel geometry and hydraulic characteristics, only the main channels draining into ADLL were considered for the analysis (Arroyo Mocho, Arroyo las Positas, and Alamo Canal).

**TABLE 3.2-5
SUMMARY OF WASH LOAD AND BED MATERIAL EXITING THE WATERSHED**

Scenario	Wash Load (yards ³ /year)	Bed Material Load	
		(yards ³ /2-yr event)	(yards ³ /100-yr event)
Existing development + existing channel capacity ^a	184,000	12,000	170,000
Build-out (future) + existing channel capacity	172,000	18,000	120,000
Build-out (future) + SMMP implementation ^b	172,000	18,000	120,000

^a Existing Conditions

^b Project Conditions

SOURCE: RMC, 2004a

In terms of water quality, the decrease in wash load (i.e., silts and sands) is expected to be beneficial, as these sediments are typically responsible for increases in flow turbidity and, in sufficient amounts, have detrimental effects on the spawning and migration success of certain fish species. Typically, wash load is evenly distributed in the water column as it is transported; bed load is transported near the bottom, either as being temporarily suspended or by saltation and rolling. Thus, a certain percentage of wash load is carried onto the floodplain when flow overtops the channel banks. RMC (2004a) estimated that the flow that would overtop Arroyo Mocho and Arroyo las Positas in the critical areas (above) adjacent to the Chain of Lakes would correspond to a 5-year runoff event and that, over time, events greater than or equal to the 5-year event would carry approximately 27 percent of the sediment load. Under future flood-flow conditions without the SMMP, wash load carried onto the floodplain could be stored or carried back to the channel, and wash load deposits from previous floods could be remobilized and returned to the channel. The dynamics of these interactions depend largely on the size of the flood. Under SMMP conditions, wash load that would normally be carried onto the floodplain is stored in the Chain of Lakes and completely disconnected from interacting with the main channel. So, the actual effect of SMMP implementation is not the volume of sediment yielded, but rather where the sediment that is lost from transport in the main channel is stored. Without implementation of the SMMP, this sediment would eventually return to the channel during the same event, or settle on the floodplain around Las Positas Golf Course and Stanley Boulevard and potentially be returned to the channel during another event; under build-out with SMMP project conditions, this sediment is stored in Cope Lake as flood flows are diverted per Projects R.5-3 and R.6-2.

Although implementation of the SMMP's Chain of Lakes projects (i.e., R.5-3 and R.6-2) provides a means for sediment wash load management during channel overtopping flood events, the overall suspended sediment load carried by the channels to Alameda Creek, for the most part, does not change. Therefore, although localized sediment deposition within the existing 100-year floodplain in the vicinity of the Chain of Lakes would be contained within Cope Lake, no substantial alteration in sediment yield from ADLL to Alameda Creek would occur. Therefore, potential impacts are less than significant. Furthermore, wash load sequestered in the Chain of

Lakes is not available for remobilization by future storm flows, and thus this is a beneficial impact in terms of water quality.

Impact 3.2.5. Localized Bed Erosion and Sedimentation: Implementation of certain types of SMMP projects could potentially impact localized bed erosion and sedimentation processes. Less than Significant with Mitigation.

Implementation of individual projects within the SMMP would affect localized movement and distribution of sediment within the project area. As discussed in Chapter 2, Project Description, sedimentation has dramatically affected channel and bridge conveyance capacity within the SMMP project area. Several elements of the SMMP would affect local sediment transport within the system, including sediment basins, bank stabilization projects, establishment of buffer areas, grade control structures, and sediment management policies. Improved localized sediment management is anticipated to more effectively convey sediment through the system to reduce build up, and to direct sediment deposition to specific sediment basins to facilitate removal.

Bed Erosion (Bank Stabilization and Levee Projects)

Levees, and to a lesser degree, bank stabilization projects could increase the potential for erosion of stream bed material above and beyond that experienced due solely to the predicted increase in future flood flows. The presence of levees, apart from dramatically increasing flood protection, also tend to increase the depth of flow during flood events and can potentially cause increased erosion of bed material. As the depth of flow increases it exerts more force on the bed (as opposed to alleviating such a force by overtopping natural banks and spreading over a floodplain) and can thus entrain more material from the bed and set it in motion. Bank stabilization projects could have the same effects, however, these projects are in response to existing erosion and instability issues and generally serve to decrease the entrainment of bank material into the water column; therefore, localized bank stabilization projects tend to be beneficial.

An example of a levee project is Project R.3-3, which involves construction of a levee along a 3,660-foot section of Arroyo Mocho. This project could have potential impacts on bed erosion for the reasons discussed above. However, sedimentation is decreasing the channel capacity in the vicinity of Project R.3-3, and the presence of a levee, aside from providing protection to existing residential developments, would probably be beneficial in terms of moving stored sediment and alleviating, at least in part, the existing channel capacity issue. Furthermore, a sediment basin is scheduled (part of Project R.3-4) to be constructed just downstream that would capture any significant flux of sediment moving downstream in this area of Arroyo Mocho; and a wetland is scheduled (part of Project R.3-2) to be constructed just upstream that will capture some of the sediment before entering the Project R.3-3 reach. Again, the additional capacity afforded by 1) sediment basins and constructed wetlands and 2) the one-time removal of sediment in reaches that have dramatically reduced capacity, should be more than adequate to not only provide protection from the impacts of future increases in flow (due to increased development and irrespective of

SMMP implementation) but mitigate any increase in sedimentation caused by SMMP projects incorporating levees, floodwalls, or bank stabilization measures.

Sedimentation

Certain SMMP projects, some by design and some as a residual effect, may increase local sedimentation. For the sediment basins, capturing sediment is their intention. In the case of constructed wetlands and off-channel seasonal ponds, sediment will tend to accumulate in these areas of reduced velocity. Sediment sequestration, to a certain degree, is necessary for proper wetland function and it also benefits downstream water quality in the channel. However, too much sediment build-up could reduce the capacity and otherwise negate the beneficial effects of these features and even result in a significant impact in terms of increased sedimentation.

The SMMP includes establishment of sediment basins at six locations within the SMMP project area. Individual facilities are proposed in Projects R.1-1, R.1-3, R.3-4, R.5-3, and R.8-1 and have been located at transition areas between high and low capacity channels or gradients (as identified by the Ayres Associates mapping of aggradation and degradation locations within the SMMP project area. Appropriate siting, sizing, and maintenance of sediment basins would capture bed load and, to a lesser degree, wash load sediments. This would provide two beneficial effects: 1) deposition in designated sediment traps would reduce the potential for sediment deposition to effect downstream channel capacity, and 2) sediment basins would consolidate and minimize the aerial extent of sediment removal and maintenance activities necessary on an annual basis.

The Chain of Lakes Area and the related SMMP projects, designed to divert and store flood flows, are a focal point of the entire project and an integral part of the regional flood protection goal of the SMMP. Flood flows would tend to carry the most sediment and any diversion, re-direction, storage, or simply slowing down of such flows could cause the deposition of sediment such that a significant impact occurs in terms of affecting existing habitat and reducing the designed capacity of conveyance channels or detention ponds. Projects R.5-3 (Arroyo Las Positas Diversion Project) and R.6-2 (Arroyo Mocho Bypass and Regional Storage at Chain of Lakes) are examples of large-scale projects that may have a significant impact on increasing local rates of sediment deposition. Because of the highly variable and ephemeral nature of most of the channels and arroyos in the SMMP project area (see Figure 3.2-3), the movement of large amounts of sediment (i.e. amounts that could be problematic in terms of the capacity of SMMP projects such as the Chain of Lakes area) is expected to occur episodically during infrequent, high-magnitude flood events. Thus, sediment accumulation is not expected to operate as a chronic process in this system, and given proper implementation and adherence to routine maintenance and inspection of areas that are expected to accumulate sediment, any temporary accumulation of sediment is expected to be handled adequately within the context of the SMMP.

Routine Maintenance. Maintenance activities would be implemented regularly (most likely on an annual basis) to maintain channels and SMMP project facilities to design conditions. Before any routine maintenance is initiated, a plan of maintenance activities would be developed based on historical needs, field inspections, and comments from the public. Notification to all parties affected would be done prior to initiation of any maintenance activity. Proposed maintenance

activities associated with erosion and sedimentation processes include the following: sediment removal, wetland and seasonal pond maintenance, and maintenance of flood control structures and equipment. Refer to Section 2.7 for a more detailed description of these specific activities as well as the overall SMMP maintenance program. Maintenance activities could be further improved and tailored depending on the results of the RMC (2004a) bed material transport analysis and the observed accumulation patterns once certain projects have been implemented.

Summary

The following factors should be adequate to reduce the significance of any erosion and sedimentation processes: 1) only bed-load exiting the watershed is expected to increase under future flow conditions (mainly due to increased flows resulting in higher stream power irrespective of SMMP implementation), 2) SMMP levee and, to a lesser degree, bank stabilization projects may increase the erosion and entrainment of bed-load material, 3) implementation of certain SMMP projects (sediment basins, constructed wetlands, and one-time sediment removal) and adherence to routine maintenance of structures and areas that will accumulate sediment. However, there are still uncertainties at the local scale of project implementation. Therefore, implementation of Mitigation Measures 3.2.1a and 3.2.1b would ensure that the potential localized bed erosion and sedimentation impacts would be less than significant.

Mitigation Measures

Mitigation Measure 3.2.5a: Sediment Transport Analysis. All projects implemented under the SMMP involving levee construction, bank stabilization, sediment or flow detention, and/or flow diversion shall prepare a project-specific sediment transport and geomorphic analysis. The purpose of the analysis will be to review proposed designs within the context of regional sediment transport.

Mitigation Measure 3.2.5b: Establish Regional Design Criteria. The SMMP shall include development of a comprehensive set of design criteria for Zone 7 facilities to ensure that sediment transport is accounted for in facility design, and to avoid sediment deposition upstream of transitional structures. To the extent feasible, these design criteria should be coordinated with other municipalities with ownership or jurisdiction of facilities within the SMMP project area.

Impact Significance after Mitigation: Less than significant.

Impact 3.2.6. Regional Flooding: Establishment of regional detention storage at Cope Lake and Lake G would provide adequate conveyance capacity to maintain 100-year flows within channels, thereby providing 100-year flood protection within the SMMP project area. This would reduce areas that are currently within the mapped 100-year floodplain and is expected to be beneficial in terms of potential regional flooding impacts. Beneficial Impact.

A number of SMMP projects are intended to attenuate the existing and future 100-year flows and thereby reduce the risk of flooding on a regional basis. As previously noted in **Figure 2-4**, several areas including the Chain of Lakes area, are shown within the current 100-year floodplain. The

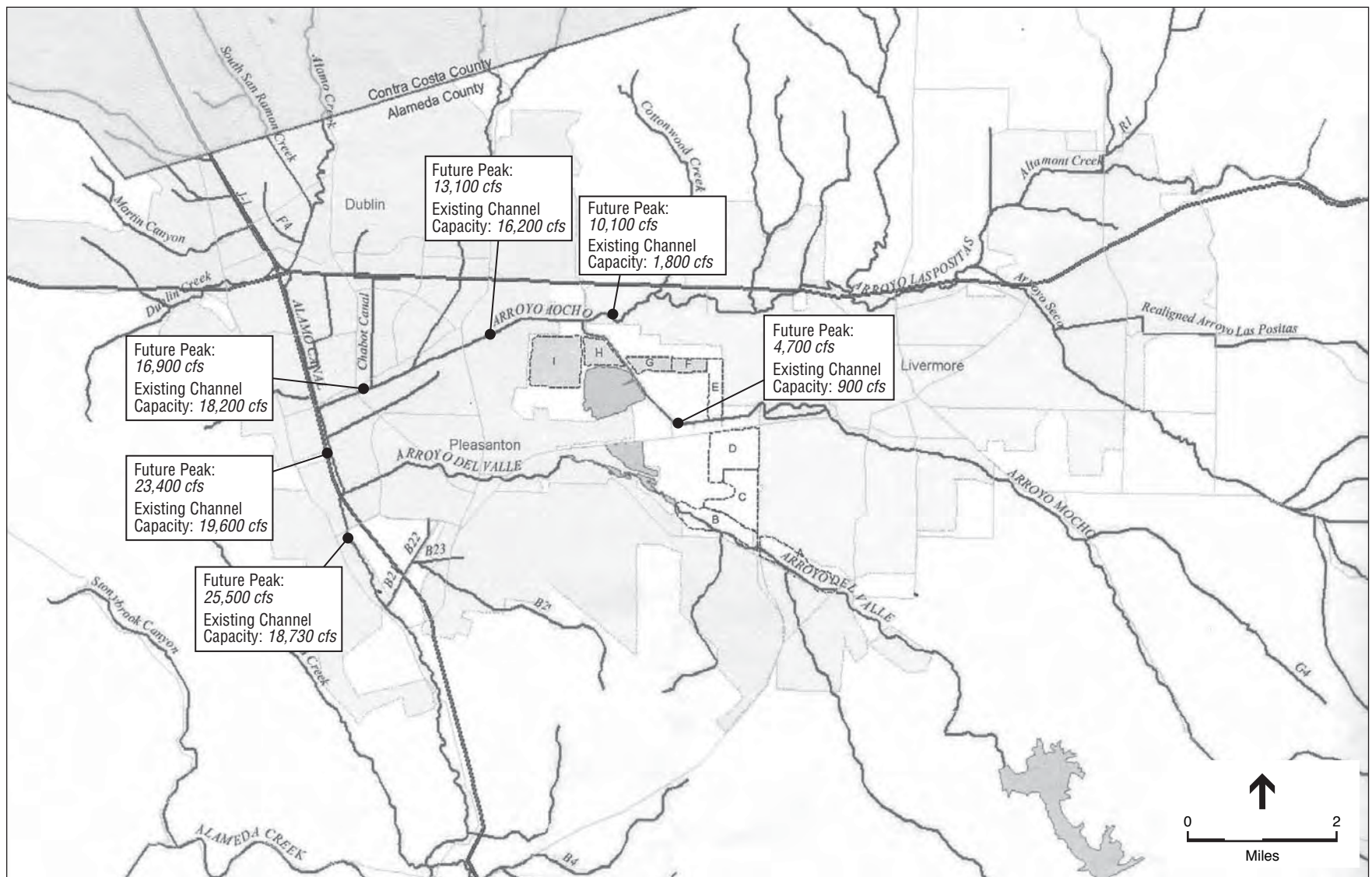
reduction in flood risk under SMMP conditions will be accomplished through storage of future flows at the Chain of Lakes and by increasing the capacity of reaches that are currently far below design capacity for the future 100-year flood. Sediment accumulation has exacerbated the issue of inadequate channel capacity in some areas. Projects R.1-1, R.5-2, R.5-3, R.8-3, R.8-4, R.9-6, and R.9-7 propose to remove over a total of 194,000 cubic yards of sediment from areas where sedimentation and channel capacity are an issue. For these particular reaches, **Figure 3.2-4** compares the existing channel capacity to the Green Book estimated 100-year flows. Green Book flows represent the 100-year flows that are expected in the channels if they are improved (i.e., with increased conveyance capacity) to Green Book standards. In this case, Arroyo las Positas at the Las Positas Golf Course and Arroyo Mocho along the Chain of Lakes would be improved to convey the entirety of their future peak flows (10,100 cfs and 4,700 cfs respectively). Projects R.5-3 and R.6-2 would increase channel conveyance by widening Arroyo las Positas through the golf course and implementing vegetation management along a 15,000-foot stretch of Arroyo Mocho, respectively. Furthermore, Projects R.5-3 and R.6-2 propose to detain flood flows in the Chain of Lakes area. Project R.6-2 would divert flood flows from Arroyo Mocho into a new bypass channel that would either direct the flow around the Chain of Lakes and into the widened section of Arroyo Mocho at El Charro Road, or direct flows into Cope Lake or Lake G for temporary detention. A similar diversion and bypass channel would be constructed under project R.5-3 to direct flood flows from Arroyo las Positas to Cope Lake or Lake G for detention or bypass them to the widened section of Arroyo Mocho. A conceptual rendering of these Chain of Lakes diversion and storage pathways, under the future 100-year flow scenario, is presented in **Figure 3.2-5**.

Table 3.2-6 presents a summary of existing channel capacities, the future (build-out) Green Book flows, SMMP channel capacities, and SMMP channel flows for three stations of particular concern. Under existing channel capacity conditions, the future Green Book 100-year flow would be well in excess of the channel capacity for the stations on Arroyo Mocho and Arroyo las Positas and flooding will likely result at these stations. **Figure 3.2-6** compares the existing channel capacity to the future estimated 100-year flows for the reaches downstream of the Chain of Lakes.

Incorporating the predicted future 100-year flow rates (under SMMP conditions), RMC (2004b) used an existing model to analyze predicted water surface elevations (WSE) along ADLL from Arroyo Mocho to its confluence with Alameda Creek. This was done to confirm channel capacity and integrate the proposed design of the new bridge at Bernal Avenue. Flow rates at the bridge were increased to reflect SMMP future flows¹¹ of 18,730 cfs. **Figure 3.2-7** shows the estimated WSE elevation profile.

Two general areas along ADLL, one located above the railroad bridges and the other at the Niles Canyon Bridge (immediately upstream and downstream), were found to have WSEs above the top of bank elevations. The area above the railroad bridges is located on the San Francisco Public Utilities Commission property and floodwaters would not extend beyond the current limit of the

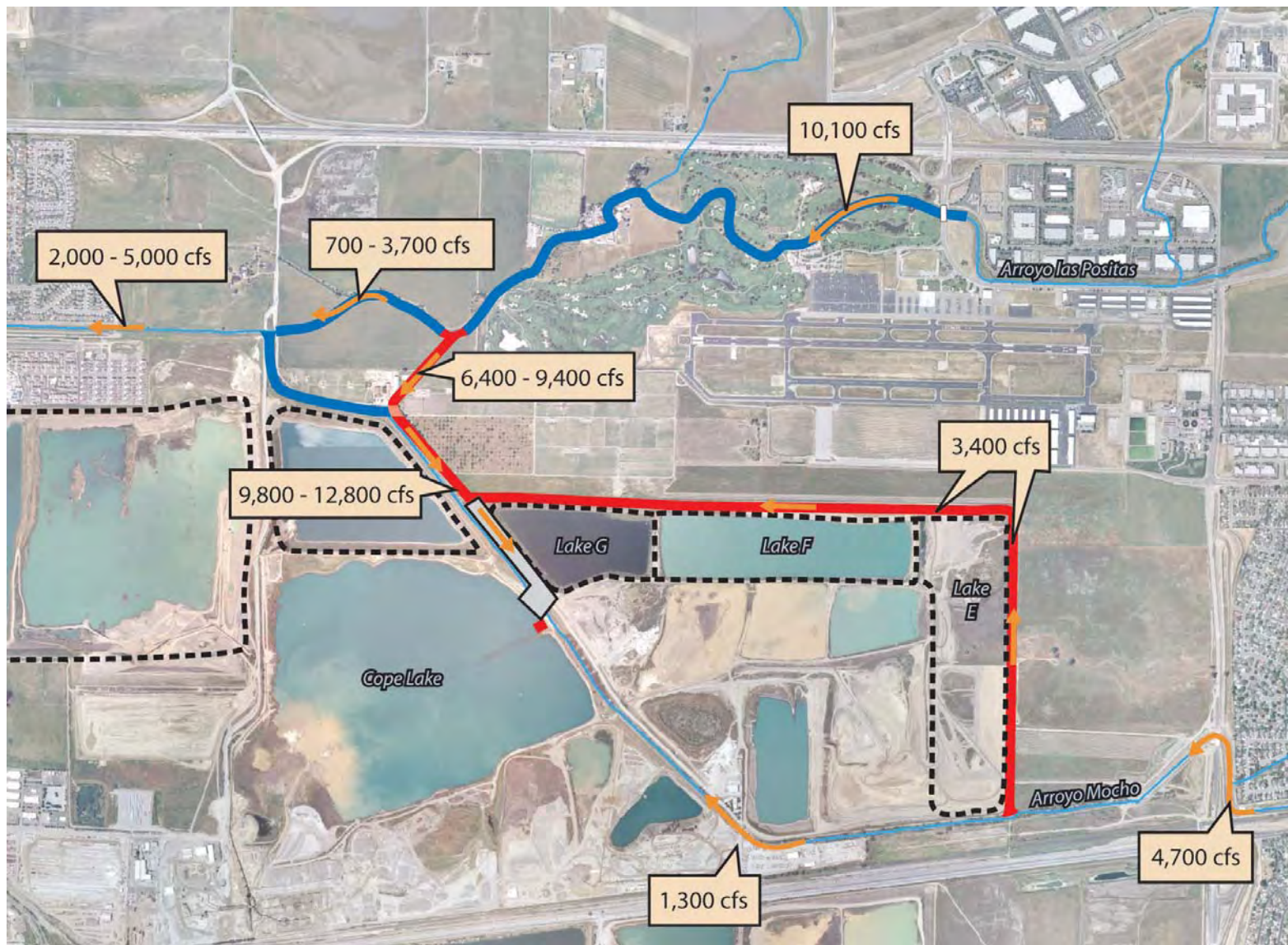
¹¹ This flow reflects a) the increased peak flow estimate due to urbanization less b) the flows diverted to storage at Chain of Lakes, with a storage capacity of 5,000 af.



SOURCE: RMC, 2004

Zone 7 SMMP . 203485

Figure 3.2-4
Future Green Book Flows vs.
Existing Channel Capacity



SOURCE: RMC, 2004

Zone 7 SMMP . 203485

Figure 3.2-5
Cope Lake Diversion – Buildout Flows

**TABLE 3.2-6
EXISTING AND FUTURE CHANNEL CAPACITY AND 100-YEAR FLOW (in cfs)**

	Arroyo Mocho	Arroyo las Positas	ADLL
Existing Capacity	900	1,800	18,730 ^e
Future 100-year Flow (Green Book) ^a	4,700	10,100	25,500
Future Channel Capacity (with SMMP)	1,300	10,100	18,730
Future 100-year Flow ^b (with SMMP)	1,300	10,100 ^c / 700 - 3,700 ^d	18,730

- ^a Green Book estimated 100-year flow or flow estimated at ADLL if flood control channels are improved to Green Book standards.
^b Future 100-year Flow reflects the effect of diversion and storage in the Chain of Lakes, per SMMP Projects R.5-3 and R.6-2.
^c Upstream of proposed SMMP diversion on Arroyo las Positas.
^d Downstream of proposed SMMP diversion on Arroyo las Positas during a stormwater diversion event.
^e Based on hydraulic analysis conducted by RMC, the ADLL reach downstream of Bernal Avenue Bridge has a channel capacity greater than 18,730 cfs. Based on hydraulic analysis conducted by West Yost & Associates (2001), the capacity of this reach is less than 22,180 cfs. As a result, the actual channel capacity lies between 18,730 and 22,180 cfs.

floodplain, therefore no projects were recommended. The area around the Niles Canyon Bridge is in the vicinity of the Sunol Glen Elementary School. After field verification, it was determined that construction of a levee was necessary to prevent flooding along the west bank of ADLL. This recommendation has been incorporated into Project R.10-5.

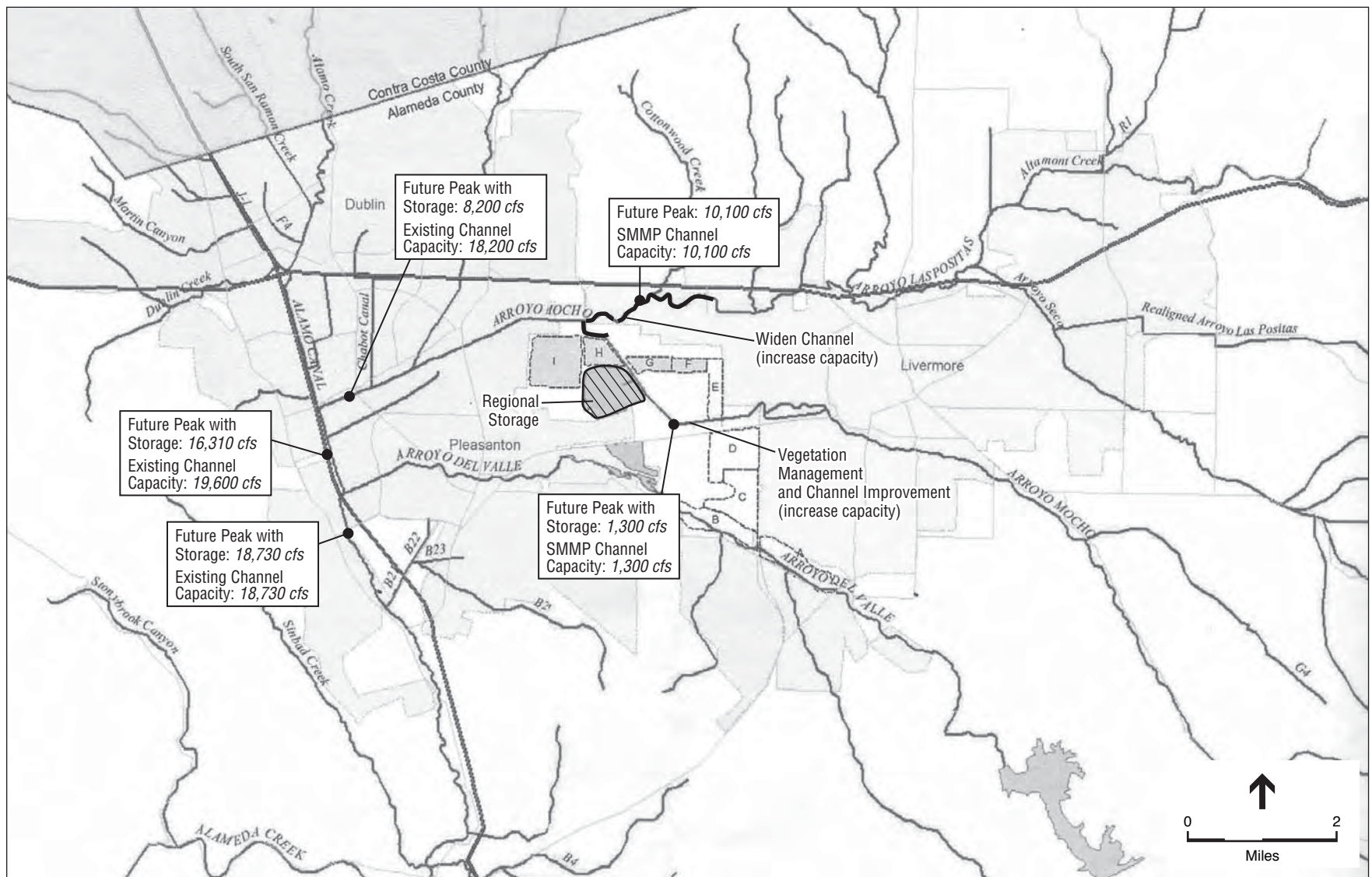
Based upon water surface elevation (WSE) modeling conducted by RMC (2004b), implementation of the SMMP regional detention storage facility appears capable of providing adequate flood detention to maintain water surface elevations at acceptable levels (i.e., flows that could be conveyed in a 100-year storm event, utilizing the available capacities of Arroyo Mocho and ADLL).

In summarizing previous work, RMC¹² showed that detention storage can greatly reduce the peak flow in lower Arroyo Mocho and ADLL. Peak flow reduction in the main channels has a secondary beneficial impact of decreasing backwater effects¹³ in the tributaries to ADLL and Arroyo Mocho. For example, the WSE in lower Arroyo Mocho is lower with implementation of regional storage under the SMMP; as a result, the backwater effect exerted by Arroyo Mocho on Chabot Canal is diminished under the SMMP.

Either through an increase in conveyance capacity, storage of flood waters at Chain of Lakes, or a combination of both, the 100-year future design flow would be contained at these areas of historic risk and the potential operation related flooding and floodplain impacts are beneficial at the MEIR level.

¹² *Draft Technical Memorandum, Flooding Conditions with SMMP Regional Storage Implementation (RMC, November 2005)*

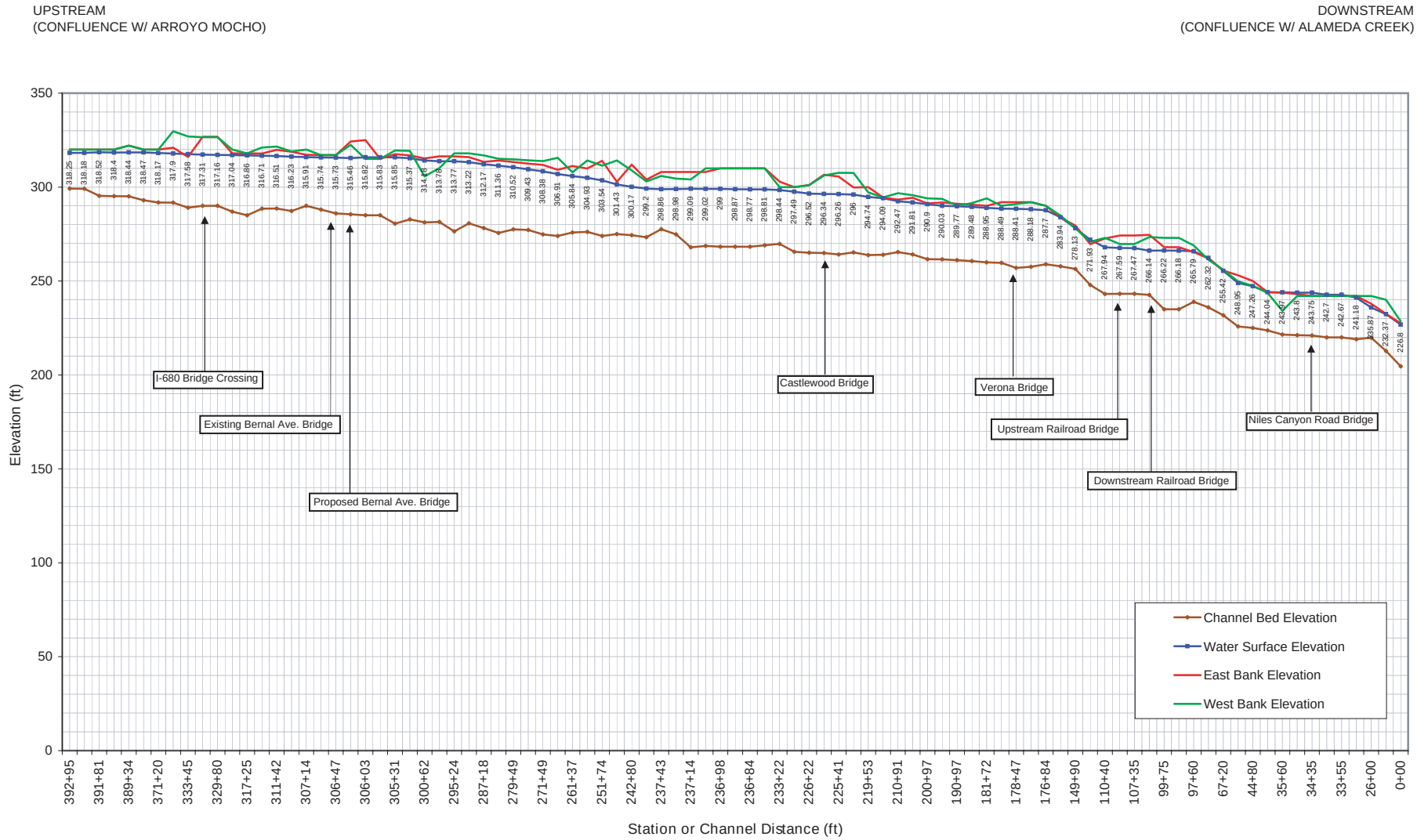
¹³ Backwater effect refers to the profile (or grade) control that downstream WSEs exert upon upstream WSEs, particularly during flood events. For example, if during a flood, water begins to “pile up” behind a particular structure, this process can cause a backup of the water for some distance upstream along the main stem or a tributary.



SOURCE: RMC, 2004

Zone 7 SMMP . 203485

Figure 3.2-6
Future Flows with SMMP
vs. Channel Capacity



SOURCE: RMC, 2004

Zone 7 SMMP . 203485

Figure 3.2-7
Water Surface Elevations along
ADLL – SMMP Conditions

Impact 3.2.7. Altered Flow Regime: Operation of the SBA Turnout project on Arroyo Mocho (R.3-1) and the Sycamore Grove Recharge Bypass project on the South Tributary of Arroyo del Valle (R.4-1) could result in altered flow regimes for these channels. Less than Significant with Mitigation.

Both projects propose to release water from the SBA into natural streams for recharge purposes. In the case of Project R.3-1, a new SBA turnout on Arroyo Mocho would be constructed to increase groundwater recharge downstream. Under Project R.4-1, existing summer-time water releases from Del Valle Reservoir into Arroyo del Valle would be replaced by SBA water releases into South Tributary (tributary to Arroyo del Valle). This project would result in the restoration of a more natural hydrology (i.e., dry channel during summer and fall months) in Arroyo del Valle upstream of the South Tributary confluence. The proposed discharge capacity, release volumes, frequencies, seasons, and operations at these two locations have not been determined.

Project R.3-1 would provide additional flexibility for the Zone 7 Artificial Stream Recharge Program, as Arroyo Mocho contributes significantly to regional groundwater recharge. Project R.4-1 would restore a more natural hydrologic regime in Arroyo del Valle. As shown in **Figure 3.2-3**, the presence of Del Valle Reservoir (completed in 1968) has altered the hydrologic regime of Arroyo del Valle downstream. The flow duration curve upstream of Del Valle Reservoir exhibits a normal regime with a natural, highly variable distribution of flow; the flow duration curve downstream of Del Valle Reservoir shows the effects of impounding the arroyo, namely a less variable distribution of daily flows. This decrease in variability is a result of capturing the moderate to higher flows during the winter and prolonged releases of lower flows during the dry season for groundwater recharge and delivery requirements.

Both proposed projects may result in significant impacts to channel stability due to increasing the volume and duration of flow through their respective reaches. Increasing the volume and duration of flow, particularly during the dry season, could result in excess bed and bank erosion and, ultimately, an adjustment of channel form over time. The degree to which these reaches would be affected by an increase in flow depends upon their response potential (i.e. how the reach would accommodate such an increase). A number of factors typically determine the response potential of a channel or ephemeral wash, including: the size distribution of bed and bank substrate, the most “effective” discharge in terms of long-term sediment movement, and the slope of the reach, to name some of the primary factors. These factors, among others, should be assessed at the project level prior to implementation of Projects R.3-1 and R.4-1.

ESA conducted a preliminary, unpublished assessment of potential release rates into the South Tributary. The assessment involved progressively larger releases of water, from the Del Valle Water Treatment Plant (WTP), into the South Tributary and subsequent field observations of flow depth and channel response. This assessment suggested that there might be an optimal range of release rates, such that an effect on channel morphology would not be expected. Furthermore, this assessment revealed that South Tributary channel morphology, upstream of the Del Valle WTP outfall between the SBA turnout and Kaltoff Bridge, is dominated by an existing debris dam (which acts as a grade control structure). Conditions upstream of the debris dam consist of an

alluvial plain with no defined channel and releases upstream of this feature may result in channel incision, ponding behind the dam, and creation of a plunge pool immediately downstream of the dam.

Thus, considering the general channel stability factors and the preliminary assessment made by ESA, implementation of **Mitigation Measure 3.2.7a** would reduce the potential impacts of these recharge projects to less than significant. ESA's preliminary assessment of potential release rates into the South Tributary involved progressively larger releases of water, from the Del Valle WTP, into the South Tributary and subsequent field observations of flow depth and channel response. Based upon this preliminary assessment, releases of between 5 and 10 cfs could be implemented in a manner that would not result in significant impacts to the environment or substantial changes in channel morphology.

Mitigation Measures

Mitigation Measure 3.2.7a: Prior to implementation of Projects R.3-1 and R.4-1, an assessment of channel condition and response potential will be conducted. Such an assessment will be conducted based upon the proposed operations schedule and rate of proposed releases from the SBA into these reaches. At the least, the channel assessment should comprise an evaluation of the hydraulic geometry of the reach and a characterization of the bed (i.e., pebble count) and bank substrate. From this assessment, and given a range of proposed rates and durations of flow, the release schedules would be modified (or verified) such that no affect on channel stability would be expected. In particular, further examination of the hydrologic effects at the debris dam location would be necessary prior to implementing Project R.4-1.

Impact Significance after Mitigation: Less than significant.

**TABLE 3.2-7
SUMMARY OF HYDROLOGY AND WATER QUALITY IMPACTS BY PROJECT**

Reach/Project	Construction Impacts			Long-term Operational Impacts			
	Impact 3.2.1 Erosion	Impact 3.2.2 Dewatering	Impact 3.2.3 Increased Storm Runoff	Impact 3.2.4 Sedimentation	Impact 3.2.5 Localized Bed Erosion and Sedimentation	Impact 3.2.6 Regional Flooding	Impact 3.2.7 Altered Flow Regimes
Reach 1							
R.1-1	LTS	N	LSM	N	N	N	N
R.1-2	LSM	N	N	N	N	N	N
R.1-3	LSM	LSM	N	LTS	LSM	N	N
R.1-4	LSM	LSM	LSM	LTS	LSM	N	N
R.1-5	LSM	LSM	N	LTS	N	N	N
R.1-6	LSM	LSM	N	LTS	LSM	N	N
R.1-7	LSM	LSM	LSM	LTS	LSM	N	N
Reach 2							
R.2-1	LSM	LSM	N	LTS	LSM	N	N
R.2-2	LSM	N	LSM	LTS	LSM	N	N
R.2-3	LSM	N	LSM	N	N	N	N
Reach 3							
R.3-1	LSM	N	N	N	N	N	N
R.3-2	LSM	LSM	LSM	LTS	LSM	N	LSM
R.3-3	LSM	N	N	N	LSM	N	N
R.3-4	LSM	LSM	N	LTS	LSM	N	N
R.3-5	LSM	N	N	N	N	N	N
Reach 4							
R.4-1	LSM	N	N	N	N	N	LSM
R.4-2	LTS	LSM	LSM	LTS	N	N	N
Reach 5							
R.5-1	N	N	N	N	N	N	N
R.5-2	LSM	LSM	N	LTS	LSM	N	N
R.5-3	LSM	LSM	N	B	LSM	B	N
Reach 6							
R.6-1	LSM	LSM	LSM	LTS	N	N	N
R.6-2	LSM	LSM	N	B	LSM	B	N
Reach 7							
R.7-1	LSM	LSM	LSM	LTS	N	N	N
R.7-2	LTS	N	LSM	N	N	N	N
R.7-3	LSM	LSM	N	LTS	N	N	N
Reach 8							
R.8-1	LSM	LSM	LSM	LTS	LSM	N	N
R.8-2	LSM	LSM	LSM	LTS	LSM	N	N
R.8-3	LSM	LSM	N	LTS	LSM	N	N
R.8-4	LSM	LSM	LSM	LTS	LSM	N	N
Reach 9							
R.9-1	LSM	N	N	N	LSM	N	N
R.9-2	LSM	LSM	N	LTS	N	N	N
R.9-3	LSM	LSM	N	LTS	N	N	N
R.9-4	LSM	LSM	N	LTS	N	N	N
R.9-5	LSM	N	LSM	N	N	N	N
R.9-6	LSM	LSM	N	LTS	N	N	N
R.9-7	LSM	LSM	N	LTS	N	N	N
Reach 10							
R.10-1	LSM	N	N	N	LSM	N	N
R.10-2	LSM	LSM	LSM	LTS	LSM	N	N
R.10-3	LSM	LSM	N	LTS	LSM	N	N
R.10-4	LSM	N	LSM	N	N	N	N
R.10-5	LSM	LSM	LSM	LTS	LSM	N	N

TABLE 3.2-7 (continued)
SUMMARY OF HYDROLOGY AND WATER QUALITY IMPACTS BY PROJECT

Reach/Project	Construction Impacts			Long-term Operational Impacts			
	Impact 3.2.1 Erosion	Impact 3.2.2 Dewatering	Impact 3.2.3 Increased Storm Runoff	Impact 3.2.4 Sedimentation	Impact 3.2.5 Localized Bed Erosion and Sedimentation	Impact 3.2.6 Regional Flooding	Impact 3.2.7 Altered Flow Regimes
Reach 11							
R.11-1	LSM	N	LSM	N	N	N	N
R.11-2	LSM	N	N	N	N	N	N
Reach 12							
R.12-1	LSM	N	N	N	LSM	N	N
R.12-2	N	N	N	N	N	N	N
SU = Significant and Unavoidable		LSM = Less than Significant with Mitigation					
PS = Potentially Significant		N = No Impact					
LTS = Less than Significant		B = Beneficial Impact					

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3.3 Geology and Soils

3.3.1 Setting

Regional Setting

Geology

The SMMP project area is located within the geologic region of California known as the Coast Ranges Geomorphic Province. This province is geologically complex, seismically active, and is characterized by northwest-trending faults, mountain ranges, and valleys. In general, the SMMP project area lies on the western flank of the Diablo Range which forms the eastern boundary of the Coast Ranges. The Diablo Range separates the geologic structural depressions of San Francisco Bay and Santa Clara Valley to the west and the San Joaquin Valley to the east. The project reaches are largely within the San Ramon and Livermore-Amador Valleys but also include portions of the Sunol Ridge and the Altamont Hills.

These northwest-trending ridges and valleys control the relief in the SMMP project area and are features attributed to the regional seismic activity. This area of California coincides with the North American and Pacific tectonic plate boundaries which dominate the structural environment by causing northwest-trending faulting and uplifting. The constant motion of these plates causes the buildup of stress which is periodically disseminated through earthquakes along those faults.

Elevations in the SMMP project area range from about 300 feet above mean sea level (msl) in the Amador Valley to over 2,000 feet above msl in the Altamont Hills. The Calaveras and Greenville faults, both major active faults, run through the SMMP project area. In addition, several minor faults, including the Las Positas, Pleasanton, Livermore, Mocho and Verona faults, also lie within the SMMP project area.

Upland areas consist of folded and faulted sedimentary rocks, including sandstones and shales which were formed in ancient marine environments. The valley areas consist of nonmarine mudstones and nonmarine sedimentary rocks. The Livermore-Amador Valley is a northwest-trending valley bounded by belts of folded and faulted bedrock, overlain by several hundred feet of alluvial sediments including silts, clays, and sands.

The alluvium is the youngest geologic formation in the vicinity. The valleys are filled with fine to coarse-grained alluvium consisting of silt, sand, and gravel deposited during the last 1.6 million years. These units, described below, are scattered throughout the intervening valleys.

Fine-grained alluvium is unconsolidated, plastic, moderately to poorly sorted silts and clays rich in organic material (Helley and Lajoie, 1979). Fine-grained alluvium is seasonally saturated and irregularly bedded. Fine-grained alluvium deposits are generally less than 10 feet thick. The deposits originated from standing floodwaters that periodically inundated low interfluvial basin areas. Potential geologic hazards associated with fine-grained alluvium include shrink-swell potential, periodic flooding, high water table, liquefaction where local shallow sand beds exist and are saturated, strong ground-motion amplification during earthquakes, and the possibility of ground failure.

Coarse-grained alluvium contains sand and silt with coarse sand and gravel becoming abundant toward fan heads and in narrow canyons, and are unconsolidated, moderately sorted, and well bedded (Helley and Lajoie, 1979). Coarse-grained alluvium deposits range from less than 10 feet to as much as 50 feet. The deposits are derived from bedrock uplands and older unconsolidated sediments deposited by flowing water on active stream levees and flood plains primarily during floods.

Medium-grained alluvium contains fine sand, silt and clayey silt with occasional thin beds of coarse sand and are unconsolidated, moderately sorted, and moderately permeable (Helley and Lajoie, 1979). Medium-grained alluvium deposits range between 0 to 12 feet. The deposits originated similarly to younger (and more coarse) alluvial fan deposits, but further from the source.

Late Pleistocene alluvium contains irregular interbedded clay, silt, sand, and gravel and is weakly consolidated, slightly weathered, and poorly sorted (Helley and Lajoie, 1979). Late Pleistocene alluvium deposits may reach 150 feet thick. The deposits originated from flowing water in stream channels, on stream terraces, and on alluvial fans.

Soils

The San Ramon, Amador, and Livermore Valleys are northwest-trending valleys bounded by belts of folded and faulted sedimentary rocks in the upland areas. In the valleys, these rocks are covered by several hundred feet of younger sediments. The Livermore Valley is the site of high-quality sand and gravel deposits that are considered to be mineral resources of statewide significance.

The valley floor slopes gently towards the west and is dissected by creeks. Slope instability is not as much of a concern in the low-lying San Ramon Livermore-Amador Valley as it is in the upland areas, although localized bank erosion and channel stability are some of the concerns.

Soils in the western upland areas of the SMMP project area consist mostly of the Millsholm-Los Gatos-Los Osos association. These soils are characterized by moderately sloping to very steep topography and well-drained soils formed from sandstones and shales. Average annual rainfall is on the order of 15 to 20 inches (USDA, 1966). The erosion hazard is considered severe and landslide potential exists most prominently with the finer textured Los Osos soils.

In the northern section of the SMMP project area, east of Highway 680, native soils in the San Ramon and Amador Valley are generally in the Clear Lake-Sunnyvale association. The Clear Lake-Sunnyvale association is characterized by nearly level topography and moderately sloping terraces with an average annual rainfall of 14 or 15 inches (USDA, 1966). The Clear Lake, Sunnyvale, Pescadero, and Danville are the principle soils of this association. Of these soils, Clear Lake and Sunnyvale soils occur within the SMMP project area. The Clear Lake soils are moderately well drained and consist of dark-gray clay at the surface and silty clay below four feet in depth. The Sunnyvale soils, formed in fine-grained alluvium from sedimentary rock, are poorly drained, deep to very deep, calcareous soils on nearly level valley floors north of Pleasanton.

Native soils in the Livermore Valley, representing the center of the SMMP project area, are generally in the Yolo-Pleasanton association. The Yolo-Pleasanton Association is characterized

by nearly level topography and range in elevations from 220 to 800 feet (USDA, 1966). The average rainfall is about 14 inches. The association consists of Yolo soils, Pleasanton soils, Sycamore soils, and Livermore soils. The Yolo and Pleasanton series consist of very deep, well-drained, grayish brown soils. Yolo and Sycamore soils in the Livermore Valley are considered to be prime agricultural soils (California Department of Conservation, 1988). Soils of the Yolo Series are well-drained, moderately deep to very deep, loamy soils on nearly level valley floors west of Livermore and on the gently sloping to strongly sloping fans in small valleys east of Hayward (USDA, 1966). Soils of the Sycamore Series consist of poorly drained soils that formed in alluvium from sedimentary rock. These soils are on floodplains with slopes of 0 to 2 percent. The average annual rainfall is 14 to 18 inches and soils are rarely dry below a depth of 20 inches (USDA, 1977).

Soils in the upland areas of the eastern SMMP project area consist mainly of the Altamont-Diablo association. The Altamont-Diablo series are characterized by moderately sloping to very steep topography and consist of the Altamont, Diablo and Linne soils. These soils are typically fine textured and result from eroded sedimentary source material. The soils are typically well drained and generally moderately deep to deep. Altamont soils are formed from weathered shale and sandstone and tend to be well drained and break into a blocky structure. Diablo soils are similar to Altamont but tend to be more gray than the usually dark brown Altamont soils. Linne soils are typically more granular and either dark gray or dark brown in color.

The southeastern section of the SMMP project area generally consists of the Vallecitos-Parrish Series soils. This series is characterized by steep to very steep topography and frequent bedrock outcroppings. The Vallecitos, Parrish, and Henneke soils make up this association and are typically shallow loamy soils with some gravel. The Vallecitos soils are very similar to the Parrish and tend to be found on the higher elevations and are well drained. The Henneke soils are also well drained but tend to be more eroded than the Vallecitos or Parrish soils.

Table 3.3-1 shows the various soil types present in the SMMP project area.

Seismic Hazards

The SMMP project area, and the San Francisco Bay Area as a whole, is located in one of the most seismically active regions in the United States. Major earthquakes have affected the region in the past and are expected to occur again in the near future. On the basis of research conducted since the 1989 Loma Prieta earthquake, U.S. Geological Survey (USGS) and other scientists conclude that there is a 62 percent probability of at least one magnitude 6.7 or greater quake striking the San Francisco Bay region before 2032 and capable of causing widespread damage, (USGS, 2003).

Each year, low and moderate earthquakes occurring within or near this region are felt by residents of the eastern Bay Area. Five major fault zones are located in or near the SMMP project area: the San Andreas, Hayward, Calaveras, Concord, and Greenville fault zones (County of Alameda, 1995). These are active faults capable of producing damaging earthquakes that could have impacts on the SMMP project area. An active fault is classified by the California Geological

**TABLE 3.3-1
SOIL PROPERTIES WITHIN THE SMMP PROJECT AREA**

Series	Soil Type(s)	Slope (percent)	Shrink-Swell	Erosion Hazard
Altamont	Altamont clay	3 to 75	High	Slight to Severe
Clear Lake	Clear Lake clay	0 to 3	High	Slight
Danville	Danville silty clay loam	0 to 10	Moderate	Slight to Moderate
Diablo	Diablo clay	15 to 30	High	Moderate to Severe
Henneke	Henneke rocky loam	NA	Low	Severe
Linne	Linne clay loam	3 to 45	Low	Moderate to severe
Livermore	Livermore very gravelly coarse sandy loam	Nearly level	Low	Slight
Los Gatos	Los Gatos-Los Osos complex	30 to 75	Low	Severe
Los Osos	Los Osos silty clay loam	7 to 75	Low to Moderate	Moderate to Severe
Millsholm	Millsholm silt loam	30 to 75	Moderate (1966) Low (1977)	Severe
Parrish	Parrish gravelly loam	30 to 75	Low to Moderate	Severe
Pescadero	Pescadero clay	NA	Moderate to High	Slight
Pleasanton	Pleasanton gravelly loam	0 to 12	Low to Moderate	Slight to Moderate
Sunnyvale	Sunnyvale clay loam over clay	nearly level	High	Slight
Sunnyvale	Sunnyvale clay loam	nearly level	High	NA
Sycamore	Sycamore silt loam	nearly level	Low (1966); Moderate (1977)	Slight
Sycamore	Sycamore silt loam over clay	nearly level	High	NA
Vallecitos	Vallecitos rocky loam	30 to 75	Low	Severe
Yolo	Yolo gravelly loam	0 to 3	Low	Slight
Yolo	Yolo loam	0 to 3	Low	NA
Yolo	Yolo loam over gravel	0 to 3	Low	

NOTE: A given range of erosion hazard indicates that the hazard increases with the steepness of the slope.
NA – Not available.

SOURCE: USDA, 1966; USDA, 1977

Survey (CGS – previously the California Department of Mines and Geology) as a fault that has had surface rupture within the past 11,000 years. The two nearest fault zones are the Northern Calaveras and the Greenville faults, which bound the SMMP project area to the west and east, respectively (see **Figure 3.3-1**).

Several minor faults are located in or adjacent to the SMMP project area and include: Pleasanton, Livermore, Las Positas, Verona, Corral Hollow, and Black Butte faults. The Pleasanton, Las Positas, and Verona faults located within the SMMP project area are considered sufficiently active faults. The Las Positas fault, a Late Quaternary fault, experienced minor slip during the 1980 Greenville rupture, and runs roughly east west and within Reach 2 of the SMMP project area. The Livermore fault is a potentially active fault, meaning it has shown evidence of surface displacement during Quaternary time (last 1.6 million years ago to present). Fault locations relative to the SMMP project area are shown in **Figure 3.3-1**. A specific discussion of the major active faults nearest the SMMP project area is provided below.

Calaveras Fault. The Calaveras fault is a major right-lateral strike-slip fault that is considered active. The fault separates rocks of different ages, with older rocks west of the fault and younger sedimentary rocks to the east. The location of the main, active fault trace is defined by newer geomorphic features (linear scarps and troughs, right-laterally deflected drainage, sag ponds) and local groundwater barriers.

The Calaveras fault is designated as an Alquist-Priolo Earthquake Hazard Zone (see discussion on this zone designation below). The Calaveras Fault runs northwest across Reaches 9, 10, and 11 within the SMMP project area.

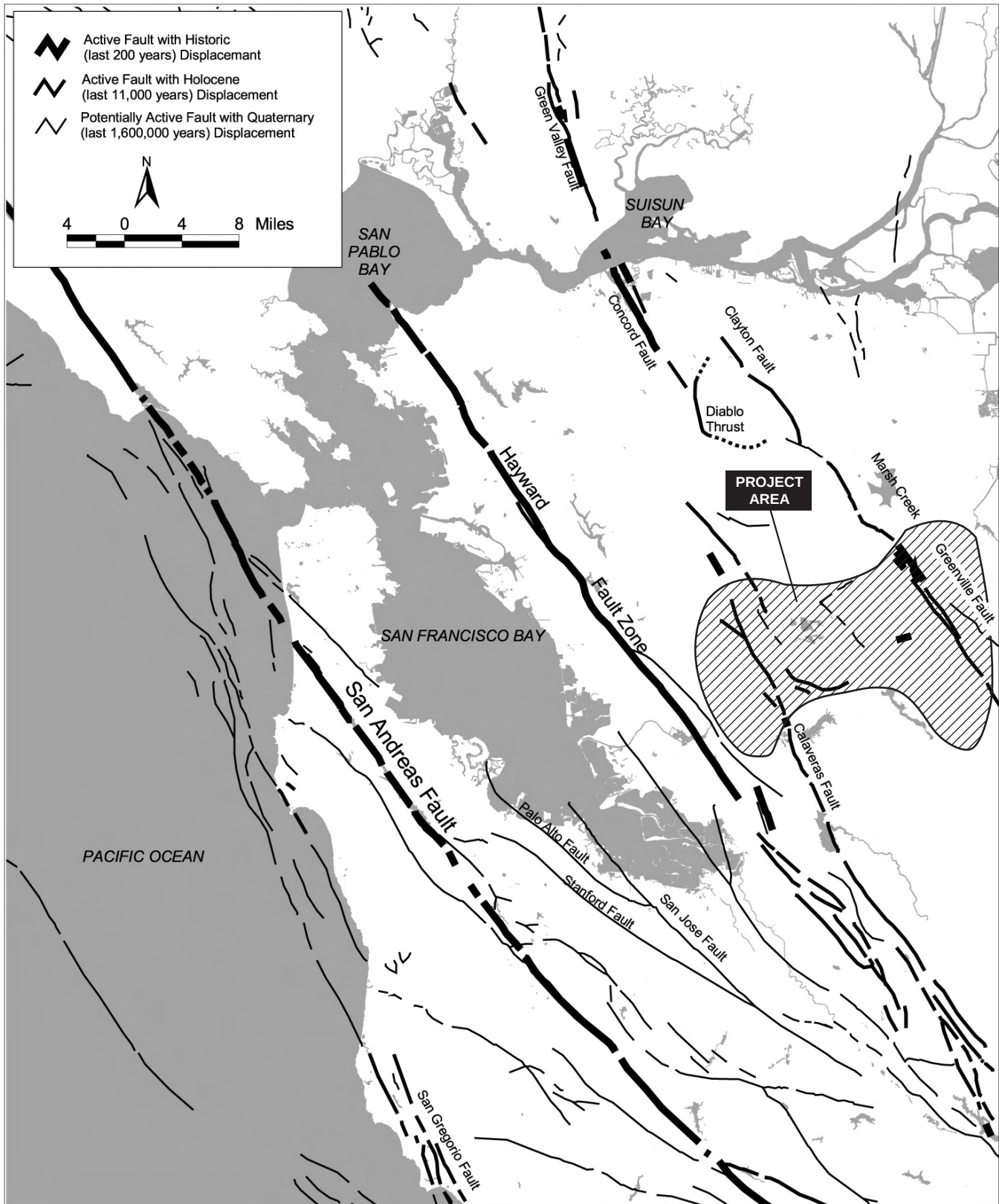
Greenville Fault. The Greenville Fault, also known as the Marsh Creek-Greenville fault, extends along the base of the Altamont Hills, which form the eastern margin of the Livermore Valley. The fault is recognized as a major structural feature and is considered active. A magnitude 5.6 earthquake on the Greenville fault in 1980 produced a small amount of surface rupture (approximately 3 centimeters) on the fault near Vasco Road. The Greenville Fault is designated as an Alquist-Priolo Earthquake Hazard Zone (see discussion on this zone designation below) and runs across Reach 1 within the SMMP project area.

Pleasanton Fault. The Pleasanton fault, a minor fault¹ about two miles east of the Calaveras fault, is also considered to be active and is designated as such under the Alquist-Priolo Act. The active portion of the fault is about six miles in length.

Fault Rupture

All structures and infrastructure constructed in the vicinity of active faults could be severely damaged or destroyed by fault rupture or creep. Current structural engineering design, materials, and construction methods provide strategies for reducing hazards in zones of potential fault rupture. However, risks remain high and no structure of even the best design could withstand a substantial displacement of the earth on a fault without experiencing severe damage and possible collapse.

¹ A Minor Fault is generally a fault with relatively short overall length and considered incapable of producing a significant seismic event.



SOURCE: California Department of Conservation,
Geological Survey (After Jennings, 1994)

Zone 7 SMMP . 203485

Figure 3.3-1
Principal Active Faults in the
Project Vicinity

Active faults in the SMMP project area, including the Pleasanton fault, Calaveras Fault Zone, Las Positas, Verona, and Greenville Fault Zone, are included within an Alquist-Priolo Special Studies Zone. The Alquist-Priolo Earthquake Zoning Act (formerly known as the Alquist-Priolo Special Studies Zone Act of 1972) was enacted to mitigate the hazards of surface fault rupture along earthquake faults considered to be "sufficiently active and well-defined as to constitute a potential hazard to structures from surface faulting or fault creep" (CDMG, 1997). Under the act, faults are considered as active or sufficiently active if they display evidence of surface rupture or creep within approximately the last 11,000 years (Holocene). Under the Act, regulatory Earthquake Fault Zones have been established around each active fault. The width of the zones vary; the average width is about one-quarter mile.

Ground Shaking

Earthquakes in the Bay Area could produce strong ground shaking in the SMMP project area. Ground shaking is related to the magnitude of an earthquake, the characteristics of the seismic waves, the proximity of the earthquake epicenter to the project site, and the soil conditions at the site. Violent ground shaking is generally expected at and near a fault. However, geologic materials respond differently to earthquake waves. Deep unconsolidated materials amplify earthquake waves. Even when an earthquake epicenter is distant from a site, it can induce strong ground shaking and wave amplification with severe hazards to people and property. The depth of the sediments overlying bedrock also appears to play an important role in determining the strength of ground shaking. Observations of earthquake ground shaking indicate that earthquake waves tend to be amplified in areas of deep loose alluvial sediments (CGS, 2006).

Ground shaking intensity can be measured using the Modified Mercalli Intensity (MMI) scale. This scale reflects, to great degree, the effects of strong ground shaking created by nearness to the fault and/or the ability of geologic materials to amplify the earthquake waves. Maximum potential ground shaking at the site would result from an earthquake on Northern Calaveras fault. The predicted intensities created by an earthquake on the Northern Calaveras fault during a 6.8 magnitude earthquake are Very Violent (X) in the Pleasanton area, and Violent (IX) and Very Strong (VIII) in the Livermore area. The MMI damage levels for the project area ranges from Extreme Damage (X) to Moderate Damage (VIII). According to the Association of Bay Area Governments (ABAG), the overall probability of an earthquake of magnitude greater than or equal to 6.8 on the Northern Calaveras fault before the year 2030 is approximately 18 percent.

Ground shaking may also result from an earthquake on the Greenville Fault. The potential intensities created by a rupture of the Greenville fault during an earthquake with a 6.9 magnitude are mapped by ABAG (ABAG, 2003a). The shaking intensity is considered Very Strong (VIII) within most of the SMMP project area to Strong (VII) in the center of the SMMP project area. The MMI damage levels for the project area range from Moderate Damage (VIII) and Nonstructural Damage (VII). According to CGS, the overall probability of an earthquake of magnitude approximately 6.9 somewhere on this fault before the year 2030 is approximately 6 percent. Earthquakes on other faults generally would produce lower intensities in the SMMP project area.

Liquefaction and Lateral Spreading

Liquefaction is the rapid transformation of saturated, loose, fine-grained sediment (such as silt and sand) to a fluid-like state usually caused by ground shaking (earthquake). The ground shaking induces a rapid rise in excess pore pressure and the soil loses its bearing strength, and it may spread laterally, undergo settlement and form fissures and sand boils (upwellings of sand at the surface). Liquefaction has resulted in substantial loss of life and injury and damage to property, roads, and infrastructure. Potential for liquefaction exists in the SMMP project area where alluvial deposits and high water tables underlie the ground surface. Liquefaction potential is mapped by ABAG (ABAG, 2003b). The liquefaction potential within most of the SMMP project area is considered low to moderate, while some localized areas are considered high to very high as shown in **Figure 3.3-2**. Generally, the areas of higher susceptibility to liquefaction are those areas within creeks or streams.

The potential exists for lateral spreading in the SMMP project area during a major earthquake. In lateral spreading, the upper layers of unconsolidated sediments glide over underlying layers of liquefied sand or silt toward a free surface, such as a stream bank or cut slope. This process is generally initiated by strong seismic shaking of long duration and its effects are most pronounced when the water table is high. Lateral spreading can cause cracking and differential displacement of the ground surface on slopes as low as 0.3 degrees for distances of several hundred feet from the point of origin (County of Alameda, 1995).

There is a moderate to high potential for lurch cracking in the SMMP project area. Lurch cracking is a type of ground failure induced by strong seismic shaking where cracks form at the contact between unconsolidated and consolidated deposits along the margins of a valley (County of Alameda, 1995).

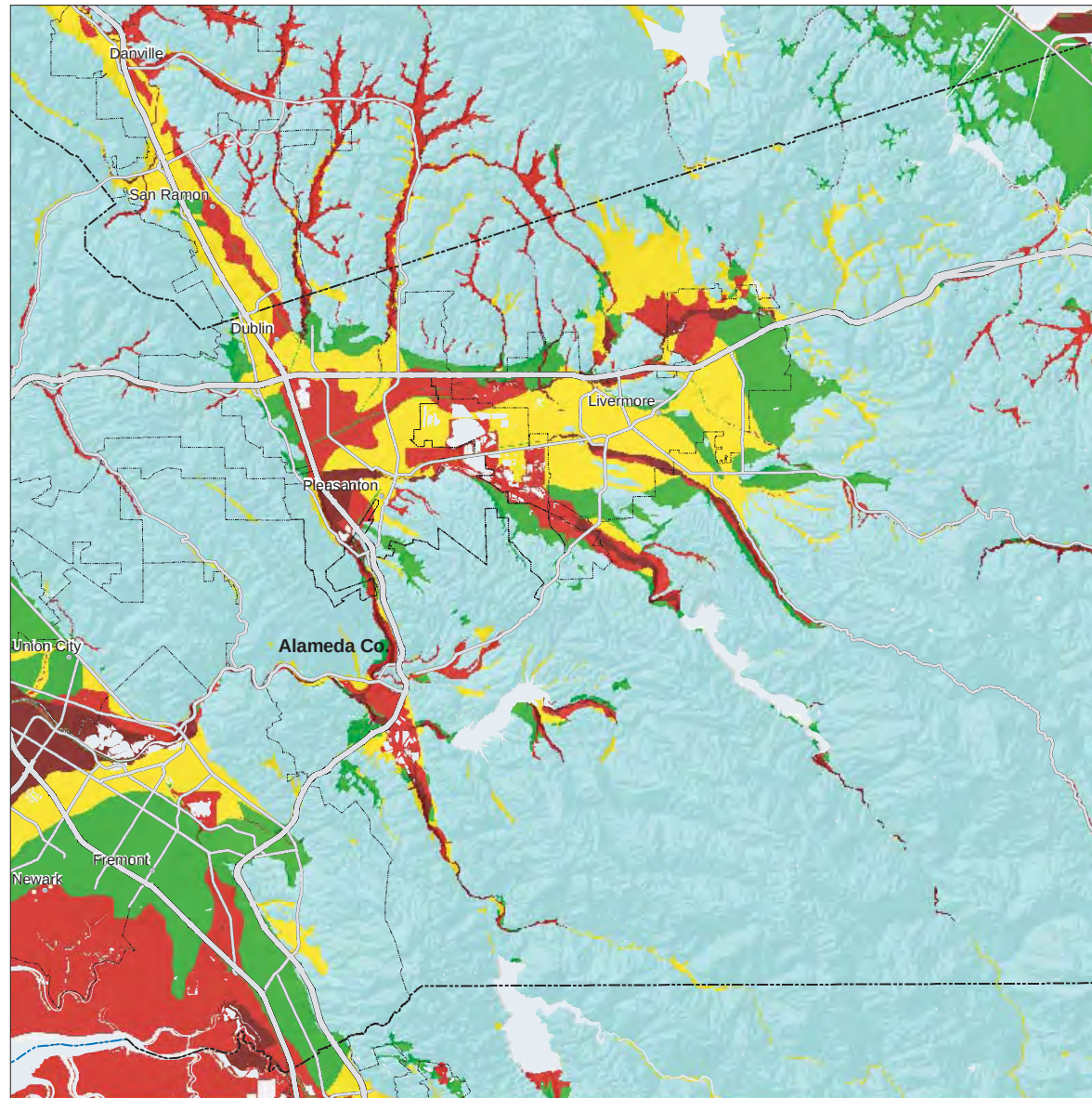
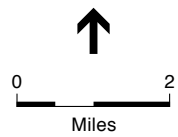
Landslides

The strong ground motions that occur during earthquakes are capable of inducing landslides and related forms of slope adjustments. Earthquakes generally induce landslides only where unstable soil conditions already exist; the ground shaking provides a mechanism for ground movement. Thus, earthquake-induced landslide hazard areas are the same as those for which a general landslide hazard is present. Much of the project SMMP project area has not been mapped as a Seismic Hazard Zone (see Regulatory Framework, below) by the CGS Survey. However, soil survey information indicates that there is potential for landslides in the upland areas within the SMMP project area. In addition, the Alquist-Priolo map for Livermore shows an area to the southeast of the city of Livermore and along the Greenville fault where massive landslide activity has occurred in the past. The Alquist-Priolo map for Dublin also shows an area upland of ADLL where massive landslide activity has occurred in the past. The canals and flood control channels in the valley have also exhibited some slumping or sliding of their banks, which is mostly due to the loss of support at the base of the slope from stream erosion.

Susceptibility Level

- Very High
- High
- Moderate
- Low
- Very Low

- Major Roads
- Local Roads



Erosion

Soil erosion is the process whereby soil materials are worn away and transported to another area either by wind or water. Rates of erosion can vary depending on the soil material and structure, placement, and human activity. Soil containing high amounts of silt can be easily erodible while sandy soils are less susceptible. Excessive soil erosion can eventually lead to water quality impacts and damage of building foundations, roadways and/or other structures. In the case of erosion associated with construction activities, typically, the potential for soil erosion is reduced once grading activities are complete and bare soil is covered with concrete, structures, asphalt, or vegetation.

3.3.2 Regulatory Framework

County and Local Regulations, Goals, and Policies

The policies and regulations associated with development of structures and geology within the affected jurisdictions are presented in **Appendix 3.3** of this EIR. State policies that guide development of structures within seismic areas are presented below.

State

Alquist-Priolo Earthquake Hazards Zone Act

The Alquist-Priolo Earthquake Hazard Zone Act (originally the Alquist-Priolo Special Studies Zone Act of 1972) requires that zones along sufficiently active and well-defined faults be established. The zones vary in width, but are in general approximately one quarter mile wide. Development is limited in areas defined as Earthquake Hazard Zones and structures for human occupancy are generally not permitted. The act regulates structures with human occupancy or usage of 2,000 person-hours per year or more.

Uniform Building Code and California Building Code

The Uniform Building Code (UBC) and the California Building Code dictate seismic design parameters for structures in California. The UBC provides a standard for building laws. Published by the International Conference of Building Officials, the UBC is a widely adopted model building code in the United States. The 1997 UBC is considered the latest edition and is adopted and used by most cities and counties.

The California Building Code incorporates by reference the UBC with necessary California amendments. The California Building Code is another name for the California Code of Regulations (CCR) Title 24 Part 2, which is a portion of the California Building Standards Code (CBSC, 2001). Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable. About one-third of the text within the California Building Code has been tailored for California earthquake conditions (CBSC, 2001).

Establishing Seismic Design Parameters

The CGS categorizes the faults in California for use with the UBC when determining seismic design parameters and classifies them as either A or B faults. The Calaveras Fault zone and the Greenville fault are B-faults.²

Seismic parameters for structures are considered at the design phase. Generally, unless required to adhere to stricter standards, the design for the structure must conform to the UBC as adopted by the city, county or agency. The seismic analysis is typically completed during the geotechnical analysis stage of the design process.

For seismic design parameters, the UBC requires that a fault factor be determined. This is dependent on proximity to the closest A-type faults. After determining the seismic zone, fault factor, soil types, and near-source factors, the data is incorporated into the structural design calculations. The A-type Hayward fault, even though located outside the SMMP project area, would likely be used to determine the fault factor.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires a State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. CGS is in the process of evaluating and mapping many areas within the SMMP project area.

3.3.3 Geology and Soils Impacts and Mitigation Measures

Significance Criteria

The impact analyses determines the significance of the levels of the project impacts based on the significance criteria set forth in Appendix G of the CEQA Guidelines. According to the significance criteria, a project would result in a significant geology and soils-related impact if it would:

- Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving earthquake rupture, strong seismic ground shaking, seismic related ground failure including liquefaction, and landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable that could potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse; or
- Be located on expansive soil creating substantial risks to life or property.

² A-faults are faults with slips rates greater than 5 millimeters per year and are well constrained because of paleo seismic date. B-faults are all other faults that lack paleo seismic data necessary to constrain the recurrence interval of large events.

Impacts and Mitigation Measures

Construction Impacts

Impact 3.3.1. Erosion: Construction of proposed facilities could result in short-term impacts associated with erosion and sedimentation. Less than Significant with Mitigation.

Implementation of the proposed SMMP would allow construction projects related to flood control and stream management within the SMMP project area. Facilities that would be constructed as a part of the SMMP projects include sediment basins, new channels and channel improvements, riparian corridor improvements, new bridges and bridge improvements, trails, a classroom education center and kiosks, etc. Construction or demolition activities associated with the implementation of the SMMP could expose people and/or structures to geology and soils-related impacts.

SMMP projects that include activities such as construction of conveyance channels, sediment basins, wetlands, and habitat ponds, would require excavation. Other activities, such as bank stabilization, construction of an education/classroom structure, widening channels, would also require excavation, although significantly less. Trail construction and most of the bank stabilization efforts would require minimal grading, paving, and other activities which would disturb the surface soil. All of these construction activities would require some degree of backfilling, earthmoving, grading, stockpiling and/or compaction, which may expose areas of soil, that have previously been covered with vegetation, to erosion. This temporary loss of erosion control will expose bare soil, which will be subjected to erosion by wind and stormwater runoff. The extent of erosion that could occur varies depending on soil type, vegetation/cover, and weather conditions.

Concentrated water erosion, if not managed or controlled, could eventually result in significant soil loss and/or discharging of sediment into installed utilities, adjacent lots, and/or nearby surface water channels. Sediment from project-induced onsite erosion could also accumulate in downstream drainage facilities, interfere with flow, and aggravate downstream flooding conditions.

Construction activities that occur as part of the SMMP could potentially result in geology and soils related impacts associated with erosion and landsliding. Without any mitigation measures, these impacts could be significant, particularly if they are located in areas with greater potential for erosion or landslides. Implementation of **Mitigation Measures 3.2.1a** and **3.2.1b** (implementation of a Stormwater Pollution Prevention Plan (SWPPP) and erosion control measures, see Hydrology and Water Quality, Section 3.2) would reduce the potential impacts to less than significant at the MEIR level.

Mitigation Measures

Implement **Mitigation Measures 3.2.1a** and **3.2.1b**.

Impact Significance after Mitigation: Less than significant.

Long-term Operational Impacts

Impact 3.3.2. Ground shaking: In the event of a major earthquake in the Bay Area Region, proposed facilities could be subject to ground shaking capable of causing localized collapse or damage of engineered fills, or structural damage. Less than Significant with Mitigation.

The SMMP project area would likely experience at least one major earthquake (greater than magnitude 7) sometime within the operational life of the SMMP. Ground shaking due to earthquakes could damage structures, including buildings, access roads, bridges, water conveyance, engineered slopes, and canal embankments. For the various proposed SMMP projects, the degree of hazard depends on the ground motion generated during an earthquake on any of the major San Francisco Bay Region faults, although the Greenville and Calaveras Fault Zones would generate the greatest ground motion due to their proximity to the SMMP project area. However, seismic activity from the Hayward and San Andreas Fault Zones could also impact the SMMP project area. The impact would be significant if ground shaking were to result in injury, structural collapse, non-repairable facility or utility damage, or severe service disruption.

Earthquakes and ground shaking in the Bay Area are unavoidable and expected to occur at some time during the life of the project. Although some structural damage is typically not avoidable, building codes and local construction requirements have been established to protect against building collapse and major injury during a seismic event. During construction, Zone 7 would comply with the requirements of the most recent California Building Code (Title 24). Conformance with these codes and implementation of **Mitigation Measure 3.3.2a** below would reduce the risks of injury and structural damage from ground shaking, liquefaction, and earthquake-induced settlement. The impact would be less than significant.

Since the active Greenville and Calaveras Faults are located within the SMMP project area, one or more of SMMP projects could be affected by the potential for surface fault rupture. In addition to the above mentioned faults, the Las Positas Fault has also experienced some sympathetic movement in recent history and could generate surface rupture. However, none of the proposed projects within Reach 2 would be located near the fault and would not have a significant potential for being impacted by fault rupture.

Of particular concern to the potential for fault rupture are the projects that may be intended for human occupancy (defined by the Alquist Priolo Act as any structure with 2,000 person hours annual usage). The only SMMP project that could include a structure intended for human occupancy would be Project R.3-2, which includes an education center/indoor classroom. The proposed location of the classroom is not within the boundaries of the Alquist Priolo Zones for any of the aforementioned faults, and is therefore considered to have a less than significant potential impact associated with fault rupture. Although surface fault rupture is not necessarily bound by the limits of the Alquist Priolo Fault Zone as determined by the Alquist Priolo maps, it is significantly less likely to occur if the project is located further away from the Alquist Priolo Zones.

Projects within Reaches 1, 9, 10, and 11 could potentially experience damage as a result of fault rupture. This damage could include damage to trails, structural damage to sediment basin berms, pedestrian bridges, any concrete structures or improvements, maintenance roads, and channel embankments. However, these types of damages are most likely repairable.

Other secondary effects of earthquake ground shaking such as liquefaction, lateral spreading, and lurch cracking could occur, particularly in areas within the creeks and channels. With conformance to the California Building Code (Title 24) and implementation of **Mitigation Measure 3.3.2a**, pedestrian bridges, culverts, floodwalls, channel improvements, or other SMMP project components may experience repairable damage as a result of these hazards, resulting in a less than significant impact.

Table 3.3-2 summarizes potential geology and soils impacts during the operational phase associated with implementation of each of the SMMP projects, required mitigation measures, and the resultant impact level, with mitigation.

Mitigation Measures

Mitigation Measure 3.3.2a: Site- Specific Geotechnical Investigation. Construction projects requiring engineering considerations and evaluations shall be determined on a project by project basis depending on scope and applicability to building code requirements. Recommendations and design criteria included in a geotechnical investigation shall be incorporated into the construction specifications of the applicable project. Design criteria shall comply with applicable standards and requirements of the most recent California Building Code (Title 24).

As part of any geotechnical investigation, if appropriate, soils at foundation or base grade shall be sampled and laboratory tested to determine the expansion potential of each soil. The study shall also evaluate the potential for unstable soils and design criteria shall be implemented as part of that project.

Project-specific surveys, if applicable, shall be performed on a project basis to determine the potential for liquefiable soils. If the project-specific studies determine a strong potential for severe damage to the proposed project, recommendations of the geotechnical report would be incorporated into the construction specifications. Recommendations could include but are not limited to compaction grouting or other in-situ densification of loose sandy or silty layers.

Impact Significance after Mitigation: Less than significant.

Impact 3.3.3. Slope Failures: Proposed facilities may be exposed to slope failures including landslides, earthflows, and rapid erosion. The flatland areas are susceptible to expansive soils and that may lead to settlement or damage to facilities. Less than Significant with Mitigation.

The exact location of the SMMP projects and associated construction activities (including construction staging areas) has not yet been determined, but could coincide with areas that are sensitive to landslides. In Alameda County as a whole, 85 percent of the landslides recorded between 1940 and 1971 occurred on slopes equal to or greater than 15 percent (USGS, 1976). Therefore, any excavation, grading, or other activities that may be located within the upland areas could be susceptible to sliding. For example, SMMP project R.9-5 includes construction of a retaining wall and if the location of the wall is at the toe of a slope, removing any material could potentially reduce slope equilibrium and trigger a landslide during construction. In addition, on-stream construction activities could disturb unstable stream or channel embankments and potentially trigger slumping or sliding of material. However, most of the proposed projects are intended to reinforce unstable areas and therefore, would not result in a significant impact.

Mitigation Measures

Implement **Mitigation Measure 3.3.2a.**

Impact Significance after Mitigation: Less than significant.

**TABLE 3.3-2
SUMMARY OF GEOLOGY AND SOILS IMPACTS BY PROJECT**

Reach/Project	Construction	Long-term Operational Impact	
	Impact 3.3.1 Erosion	Impact 3.3.2 Ground Shaking	Impact 3.3.3 Slope Failure
Reach 1			
R.1-1	LSM	LTS	LSM
R.1-2	LTS	LTS	LSM
R.1-3	LSM	LTS	LSM
R.1-4	LSM	LSM	LSM
R.1-5	LTS	LSM	LSM
R.1-6	LSM	LSM	LSM
R.1-7	LSM	LSM	LSM
Reach 2			
R.2-1	LSM	LSM	LSM
R.2-2	LSM	LSM	LSM
R.2-3	LTS	LSM	LSM
Reach 3			
R.3-1	LSM	LSM	LSM
R.3-2	LSM	LSM	LSM
R.3-3	LSM	LSM	LSM
R.3-4	LSM	LSM	LSM
R.3-5	LSM	LTS	LSM
Reach 4			
R.4-1	LTS	LTS	LSM
R.4-2	LSM	LSM	LSM
Reach 5			
R.5-1	LSM	LSM	LSM
R.5-2	LSM	LSM	LSM
R.5-3	LSM	LSM	LSM
Reach 6			
R.6-1	LSM	LSM	LSM
R.6-2	LSM	LTS	LSM
Reach 7			
R.7-1	LSM	LSM	LSM
R.7-2	LSM	LTS	LSM
R.7-3	LSM	LSM	LSM
Reach 8			
R.8-1	LSM	LSM	LSM
R.8-2	LSM	LSM	LSM
R.8-3	LSM	LSM	LSM
R.8-4	LSM	LSM	LSM
Reach 9			
R.9-1	LSM	LSM	LSM
R.9-2	LTS	LSM	LSM
R.9-3	LSM	LSM	LSM
R.9-4	LSM	LSM	LSM
R.9-5	LSM	LSM	LSM
R.9-6	LSM	LSM	LSM
R.9-7	LSM	LSM	LSM
Reach 10			
R.10-1	LSM	LSM	LSM
R.10-2	LSM	LSM	LSM
R.10-3	LSM	LSM	LSM
R.10-4	LSM	LSM	LSM
R.10-5	LSM	LSM	LSM
Reach 11			
R.11-1	LSM	LTS	LSM
R.11-2	LTS	LTS	LSM

TABLE 3.3-2 (continued)
SUMMARY OF GEOLOGY AND SOILS IMPACTS BY PROJECT

Reach/Project	Construction	Long-term Operational Impact	
	Impact 3.3.1 Erosion	Impact 3.3.2 Ground Shaking	Impact 3.3.3 Slope Failure
Reach 12			
R.12-1	LSM	LTS	LSM
R.12-2	LSM	LTS	LSM

SU = Significant and Unavoidable
LSM = Less than Significant with Mitigation
LTS = Less than Significant
N = No Impact

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3.4 Land Use

3.4.1 Setting

Regional Setting

The SMMP project area consists of twelve reaches that are located within the cities of Dublin, Pleasanton and Livermore, and unincorporated Alameda County. The Chain of Lakes Area, considered a significant aggregate resource area, is located between the cities of Pleasanton and Livermore. Other regional land uses within the Livermore-Amador Valley include the Alameda County Fairgrounds, Livermore Municipal Airport, Las Positas Golf Course, and the Shadow Cliffs Regional Recreation Area. Existing land uses include residential, commercial, industrial, recreational park, and public/institutional uses. For the purposes of this EIR, sensitive uses are considered residential or institutional (schools or hospitals) where people reside or work. These uses would be subject in particular to construction and operation impacts associated with project implementation. **Figure 3.4-1** provides an aerial view of the dominant uses as well as schools located in study area. Land uses associated with each reach are described and summarized in **Table 3.4-1**. Sensitive receptors include schools, medical facilities and residences.

Parks and recreational facilities are managed by different entities in the Livermore-Amador Valley. The East Bay Regional Park District (EBRPD) manages regional facilities in and around the Valley, including Shadow Cliffs Regional Recreation area. The City of Pleasanton Parks and Community Services Department manages neighborhood parks and trails within its jurisdiction and the Livermore Area Recreation and Parks District (LARPD) manages recreational facilities in and around the City of Livermore.

3.4.2 Regulatory Framework

The policies and regulations associated with impacts to land uses within the affected jurisdictions are presented in **Appendix 3.4** of this EIR.

3.4.3 Land Use Impacts and Mitigation Measures

Significance Criteria

For the purpose of this EIR, and consistent with Appendix G of the CEQA Guidelines, a project would have a significant land use impact if it would physically divide an established community; conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; convert prime agricultural land to non-agricultural use or impair the agricultural productivity of prime agricultural land; result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or conflict with established recreational, educational, religious or scientific uses of an area. A project may also have the potential to result in significant effects if it would be incompatible with existing land uses in the project vicinity

based on environmental impacts (e.g., noise). As existing conditions are expected to change within the next twenty years, during the course of SMMP project implementation, this analysis assumes the existence of foreseeable projects (i.e., reclamation of the quarry areas).

Impacts and Mitigation Measures

Construction Impacts

Impact 3.4.1. Land Use Disturbance: Project construction would result in short-term disturbance to adjacent land uses in the immediate vicinity of individual project sites. Less than Significant with Mitigation.

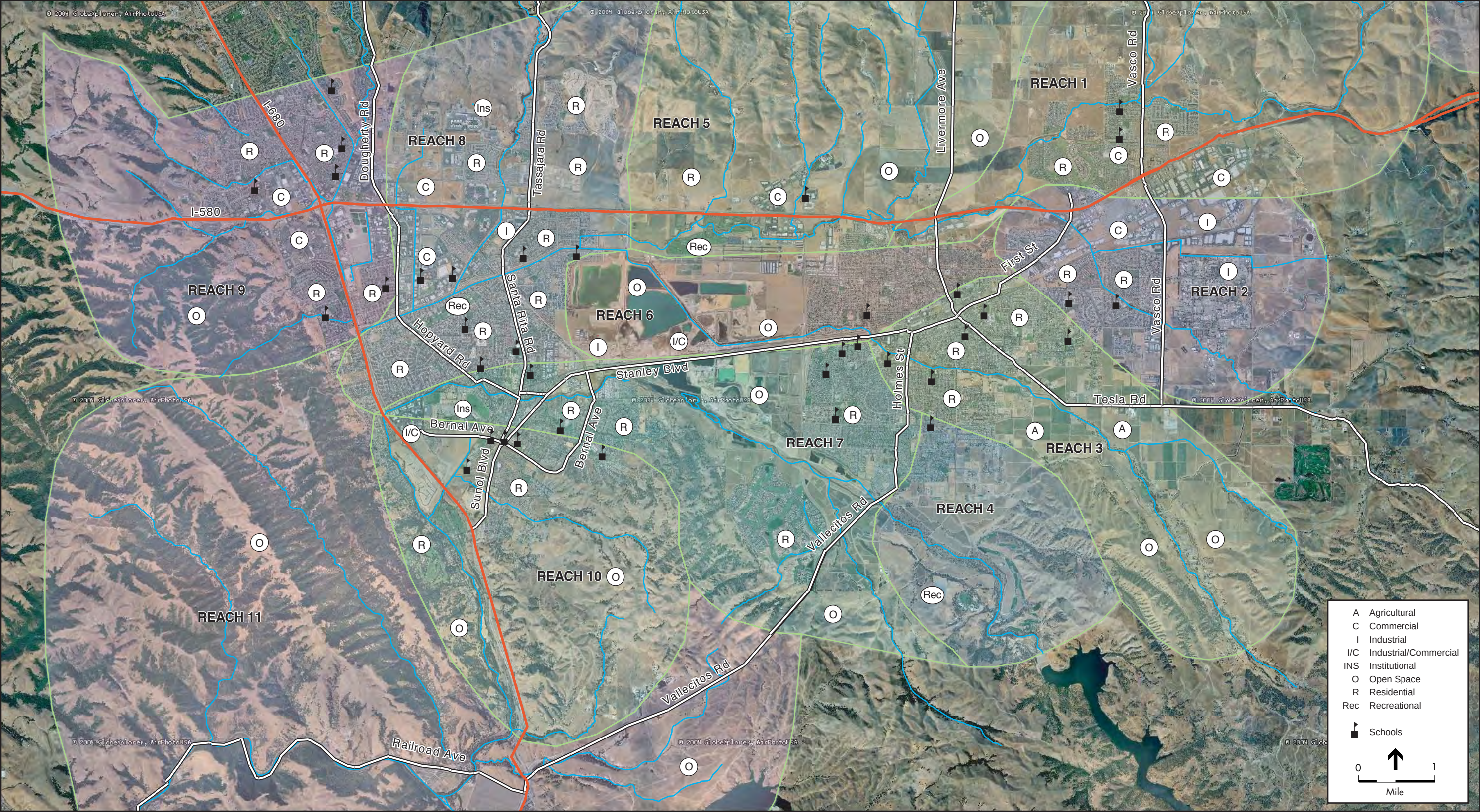
A number of land uses, such as residential areas and schools are more prone to land use disruptions (see **Figure 3.4-1**). Construction of the proposed projects under the SMMP would generate noise, dust, traffic congestion, safety hazards, as well as increased street and access disturbance that could affect adjacent land uses. Disruptions include limited access, increased noise and dust, and increased safety hazards. Construction activities are expected to last from two weeks to up to several years per site, and would typically be limited to daytime hours Monday through Friday. The intensity and severity of construction activity, the distance from the nearest sensitive receptors, and the type of impact would determine the significance levels. Generally, equipment operation within each work day would be intermittent and would vary depending on the phase of work.

With proper mitigation, temporary construction impacts and disturbance to adjacent land uses would be reduced to less than significant levels. Proposed mitigation measures include but are not limited to watering the construction site daily (to reduce dust), installing noise barriers to minimize noise levels, maintenance of public access with steel trench plates to maintain access, and providing advance notice of construction activities. Construction impacts are discussed in detail in **Section 3.7, Air Quality**; **Section 3.8 Noise**, and **Section 3.9, Traffic and Circulation**.

Although all the project sites would be subject to land use impacts from construction activities, some sites would have greater potential for significant effects due to the type of existing land uses. Each reach is discussed below with respect to potential impacts on existing land uses. Potential impacts to recreational facilities are discussed in **Impact 3.4.3**.

Reach 1

As described above, noise and dust related to construction activities would have the greatest disturbance on residences and other uses where people, particularly the elderly, children, or the sick, might be adversely affected by construction impacts during the day and/or evening. One portion of this reach is predominantly residential and would have the highest likelihood of impact from construction activities. Impacts associated with increased dust and noise would be considered significant. Projects in Reach 1 closest to residences are R.1-1, R.1-3, R.1-4, and R.1-7. All the projects would increase noise in areas surrounding the projects due to traffic traveling to and from work sites. Construction activities included in these projects that are also likely to have noise and/or dust impacts on surrounding land uses are construction of trails, sediment basin construction, low-flow channel creation and riparian projects.



SOURCE: Environmental Science Associates

Zone 7 SMMP . 203485
Figure 3.4-1
SMMP Project Area Land Uses

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**TABLE 3.4-1
SURROUNDING LAND USES**

Reach	Jurisdiction	Land Uses
Reach 1	Livermore	Open Space/Agriculture, Single-Family Residential, Public Use and Industrial. Specifically, schools in this reach include Croce Elementary School and Christensen Middle School. Springtown Gold Course is also located in Reach 1.
	Unincorporated Alameda County	Parklands and Large Parcel Agriculture.
Reach 2	Livermore	Industrial, Single-Family Residential and Commercial. Specifically, schools in this reach include Arroyo Seco and Jackson Avenue Elementary Schools.
	Unincorporated Alameda County	Industrial and Large Parcel Agriculture. Lawrence Livermore National Laboratory is located just east of this reach.
Reach 3	Livermore	Single-Family Residential, Industrial and Open Space/Agriculture. Specifically, schools in this reach include Livermore High School, Delle Valle Continuation High School, Junction Avenue Middle School, and Michell , Almond, and Arroyo Mocho Elementary Schools. There is also an additional private school located in Reach 3. Robert Livermore Park is located in Reach 3.
	Unincorporated Alameda County	Rural Density Residential, Industrial, Large Parcel Agriculture, and Parklands
Reach 4	Livermore	Single-Family Residential, Open Space/Agriculture, and Public Use. Specifically, Sunset Elementary School is located in this reach.
	Unincorporated Alameda County	Rural Density Residential and Large Parcel Agriculture.
Reach 5	Livermore	Open Space/Agriculture, Single-Family Residential, Public Use, and Commercial. Specifically, Las Positas College is located in this reach as is Las Positas Golf Course.
	Unincorporated Alameda County	Resource Management, Large Parcel Agriculture, Major Commercial, Mixed Use, Parklands, and Low Density Residential.
Reach 6	Livermore	Commercial, Public Use, Open Space/Agriculture, and Single-Family Residential. Specifically, schools include Marylin Avenue. Valley Memorial hospital is another sensitive receptor in this reach. Livermore Municipal Airport and a portion of the Chain of Lakes area are located in Reach 6.
	Pleasanton	Sand and gravel harvesting, General and Limited Industrial, Medium Density Residential, Low Density, Parks and Recreation, Public and Institutional. Specifically Mohr Elementary School is located in this reach.
	Unincorporated Alameda County	Industrial, Water Management and Major Public.
Reach 7	Livermore	Open Space/Agriculture, Commercial, Single-Family Residential, Industrial. Specifically, schools in this reach include Vineyard Alternative High School, Granada High School, Mendenhall Middle School, and Valley Memorial High School.
	Pleasanton	Low Density Residential, Medium Density Residential, High Density Residential, Rural Density Residential, General and Limited Industrial, Public and Institutional, Schools, Retail/Highway/Service Commercial, Business and Professional Offices, Sand and Gravel Harvesting, Parks and Recreation, Public Health and Safety, Public Health and Safety with Wildlands Overlay, and Business Park. Specifically, schools in this reach include Amador Valley High School and Valley View Elementary School.
	Unincorporated Alameda County	Major Public, Water Management, Medium Density Residential, and Industrial. Additionally, a portion of the Chain of Lakes area is in this reach as is Sycamore Grove Park.

**TABLE 3.4-1 (continued)
SURROUNDING LAND USES**

Reach	Jurisdiction	Land Uses
Reach 8	Dublin	Public Lands, Residential, Industrial, Commercial and Parks.
	Pleasanton	Parks and Recreation, Low Density Residential, Medium Density Residential, High Density Residential, Business Park, Public and Institutional, Schools, General and Limited Industrial, Public Health and Safety, Retail/Highway/Service Commercial, Business and Professional Offices. Specifically, schools in this reach include Fairlands Elementary School, Harvest Park Middle School, Alisal Elementary School, Hart Middle School, and Walnut Grove Middle School. Valley Care Medical Center is also located in Reach 8.
	Unincorporated Alameda County	Medium High Density Residential, Resource Management, and Low Density Residential. Shadow Cliffs Recreation Area and Santa Rita Rehabilitation Center are also located in Reach 8.
Reach 9	Dublin	Residential, Commercial, and Parks. Specifically, schools in this reach include Dublin High School, Valley Christian Schools, Fredericksen Elementary, Nielsen Elementary School, St. Raymond School, Valley Continuation High School, Wells Middle School and Valley Christian High School.
	Pleasanton	General and Limited Industrial, Public and Institutional, Rural Density Residential, Low Density Residential, Medium Density Residential, High Density Residential, Business Park, Retail/Highway/Service Commercial, Business and Professional Offices, Parks and Recreation, Agriculture and Grazing, and Schools. Specifically, schools in this reach include Donlan and Lydixen Elementary Schools and Foothill High School.
Reach 10	Pleasanton	Rural Density Residential, Low Density Residential, Medium Density Residential, High Density Residential, Public and Institutional, Public Health and Safety, Public Health and Safety with Wildlands Overlay, Parks and Recreation. Specifically, schools in this reach include Hearst and Vintage Hills Elementary Schools, Pleasanton Middle School, Horizon High School, and Village Continuation High School. Castlewood Golf Course is also located in this reach.
	Unincorporated Alameda County	Major Public, Water Management, Large Parcel Agriculture, Rural Density Residential, Low Density Residential, Resource Management, Parklands, and Industrial. The Alameda County Fairgrounds are also located in Reach 10.
Reach 11	Pleasanton	Agriculture and Grazing, Parks and Recreation.
	Unincorporated Alameda County	Parklands, Water Management, and Rural Density Residential.
Reach 12	Unincorporated Alameda County	Parklands and Large Parcel Agriculture.

SOURCE: City of Livermore General Plan (2004), Alameda County East County Area Plan (2002), City of Pleasanton General Plan (1996), and City of Dublin General Plan (2004).

Project implementation may result in potential increases in dust, noise, traffic congestion, and access blockage from construction-related activities in the immediate vicinity of the proposed project sites. Mitigation measures that require limitations on construction duration, dust control, installation of noise barrier, hotel accommodations, implementation of a Traffic Control Plan, restoration of disturbed areas, maintenance of public and private access, and acquisition of appropriate encroachment permits would reduce potential impacts to less-than-significant levels (see **Mitigation Measures 3.4.1a** through **3.4.1d** below and measures identified in **Sections 3.7** through **3.9**). Two schools are located in the reach. Construction activities in the vicinity of the

schools may affect school operations. Zone 7 would consult with the Livermore Valley Joint Unified School District to coordinate activities if that occurs (see **Mitigation Measure 3.4.1e**).

Projects R.1-1 through R.1-4 are located in or adjacent to recreational facilities (see **Table 3.4-2**). Potential impacts to recreational facilities are discussed in **Impact 3.4.3**. Implementation of **Mitigation Measure 3.4.3a** would reduce impacts to recreational facilities to a less-than-significant level.

Reach 2

Reach 2 has a significant amount of residential development. Only one of the proposed projects would be located near residences, R.2-1. Traffic traveling to and from work sites would increase noise levels. Construction activities included in Project R.2-1 with the potential to create noise or dust impacts include riparian projects and trail projects. **Mitigation Measures 3.4.1a** through **3.4.1d** and those in **Sections 3.7** through **3.9** would be implemented to reduce significant construction-related impacts on adjacent land uses within this reach to less-than-significant levels. Two schools are located on the west end of the reach, and construction activities in the vicinity of the schools may affect school operations. Zone 7 would consult with the Livermore Valley Joint Unified School District to coordinate activities if that occurs (see **Mitigation Measure 3.4.1e**).

Reach 3

Reach 3 land uses are primarily residential, agriculture and open space. As with other reaches where residential uses are present, disturbance resulting from construction activities in the immediate vicinity of these uses would be considered a significant impact. Projects located near residences include R.3-2, R.3-3 and R.3-4. R.3-2, the Robertson Park Enhancement and Levee Construction Project is located in Robertson Park, a City of Livermore recreational facility. Potential impacts to recreational facilities are discussed in **Impact 3.4.3**. Implementation of **Mitigation Measure 3.4.3a** would reduce impacts to recreational facilities to a less-than-significant level. All the projects would increase the noise levels in areas in closer vicinity of the projects due to traffic traveling to and from work sites. Construction activities included in these projects with noise and dust producing potential are wetland construction, bank stabilization, construction of an education center/in-door classroom, trails, riparian projects, and construction of a sedimentation basin. **Mitigation Measures 3.4.1a** through **3.4.1d** and those identified in **Sections 3.7** through **3.9** would be implemented to reduce significant, construction-related impacts on adjacent land uses within this reach to less-than-significant levels. Eight schools are located within this reach. School operations may be affected by construction activities. Zone 7 would consult with the Livermore Valley Joint Unified School District to coordinate activities if that occurs. Implementation of **Mitigation Measure 3.4.1e** would reduce potential impacts to less-than-significant levels.

Reach 4

Reach 4 has a small area of residential development. As with other reaches where residential, commercial, and open space uses are present, impacts resulting from construction activities closer to residences would be considered significant. Sycamore Grove Park is also located in this reach. Both of the projects in Reach 4 are associated with Sycamore Grove Park. Only Project R.4-2

would have potential impacts to recreational facilities. Potential impacts to recreational facilities are discussed in **Impact 3.4.3**. Only Project R.4-2 would have temporary construction impacts to land use resulting from traffic, noise, and dust. Trail building is the primary construction activity associated with this project. Traffic from vehicles serving the project would also be a potential contributor of noise and dust. **Mitigation Measures 3.4.1a** through **3.4.1d**, as well as those identified in **Sections 3.7** through **3.9** would be implemented to reduce significant, construction-related impacts on adjacent land uses within this reach. One school is located within this reach. School operations may be affected by construction activities. Zone 7 would consult with the Livermore Valley Joint Unified School District to coordinate activities if that occurs. Implementation of **Mitigation Measure 3.4.1e** would reduce potential impacts to less than significant levels.

Reach 5

Very little developed land uses are found in Reach 5. One project may have the potential to disturb residential land uses resulting in a significant impact. Project R.5-1 may affect some nearby residences. Due to the sporadic development in the area, traffic should not be a significant issue for this project. Trail building is the main component of this project. **Mitigation Measures 3.4.1a** through **3.4.1d**, as well as those identified in **Sections 3.7** through **3.9** would be implemented to reduce significant, construction-related impacts on adjacent land uses within this reach. One school is located within this reach. School operations may be affected by construction activities. Zone 7 would consult with the Livermore Valley Joint Unified School District to coordinate activities if that occurs. Implementation of **Measure 3.4.1e** would reduce potential impacts to less-than-significant levels.

Reach 6

Both projects planned in Reach 6 would be implemented in the Chain of Lakes area. There are two schools located in Reach 6. One of them, Mohr Elementary School is located near the northwest end of Lake H near the Chain of Lakes area at 330 Dennis Drive in Pleasanton. Elements of Project R.6-2 may impact this facility during construction. Elements of this project in proximity to Lake H include trail construction along improved El Charro Road and Stanley Boulevard connecting at Isabel Road on the west side of Lake H, Arroyo Mocho widening downstream of Cope Lake north of Lake H, and a drainback channel on the northeast side of Lake H. **Mitigation Measures 3.4-1a** through **3.4-1d**, as well as those identified in **Sections 3.7** through **3.9** would be implemented to reduce significant, construction-related impacts on adjacent land uses within this reach. One school is located within this reach. School operations may be affected by construction activities. Zone 7 would consult with the Livermore Valley Joint Unified School District to coordinate activities if that occurs. Implementation of **Mitigation Measure 3.4.1e** would reduce potential impacts to less-than-significant levels.

There are no other sensitive land uses surrounding these project areas. Therefore, impacts to surrounding land uses from construction activities would be less than significant.

Reach 7

Reach 7 has a large range of land uses including a significant area of residential development. Projects R.7-2 and R.7-3 may have the potential for impacts to residential uses. Construction activities included in these projects that are also likely to have noise and/or dust impacts on surrounding land uses are trails, fish barrier removal, and riparian projects. As with other reaches where residential uses are present, impacts resulting from construction activities would be considered significant. **Mitigation Measures 3.4.1a** through **3.4-1d**, as well as those identified in **Sections 3.7** through **3.9** would be implemented to reduce significant construction-related impacts on adjacent land uses within this reach to less-than-significant levels. Six schools are located within this reach. School operations may be affected by construction activities. Zone 7 would consult with the Livermore Valley Joint Unified School District and Pleasanton Unified School District to coordinate activities if that occurs. Potential impacts to the operation of these schools would be reduced to less-than-significant levels with implementation of **Mitigation Measure 3.4.1e**.

Reach 8

A large portion of Reach 8 is made up of residential development. Projects located near residences include R.8-1, R.8-3 and R.8-4. Construction activities associated with these projects that are also likely to have noise and/or dust impacts on surrounding land uses are trails, sediment basin construction, riparian projects, sediment removal, bank stabilization, and kiosk construction. Impacts from project implementation in the proximity of residential uses would be reduced to less-than-significant levels with implementation of **Mitigation Measures 3.4.1a** through **3.4.1d** and those identified in **Sections 3.7** through **3.9**. Six schools are located within this reach. School operations may be affected by construction activities. Zone 7 would consult with the Livermore Valley Joint Unified School District and Pleasanton Unified School District to coordinate activities if that occurs. Potential impacts to the operation of these schools would be reduced to less-than-significant levels with implementation of **Mitigation Measure 3.4.1e**.

Reach 9

Reach 9 has a significant area of residential development. The following projects may have impacts on surrounding residential land uses: R.9-1, R.9-2, R.9-4 and R.9-7. Construction activities associated with these projects that are also likely to have noise and/or dust impacts on surrounding land uses include bank stabilization, riparian projects, and sediment removal. Implementation of **Mitigation Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.7** through **3.9** would reduce potential construction-related impacts to less-than-significant levels. Six schools are located within this reach. School operations may be affected by construction activities. Zone 7 would consult with the Livermore Valley Joint Unified School District and Pleasanton Unified School District to coordinate activities if that occurs. Potential impacts to the operation of these schools would be reduced to less-than-significant levels with implementation of **Mitigation Measure 3.4.1e**.

Reach 10

Residential uses are present in a significant area of Reach 10. Projects located near residential uses include R.10-1, R.10-2, R.10-3, and R.10-4. Construction activities associated with these projects that are also likely to have noise and/or dust impacts on surrounding land uses include

trails, riparian projects, bank stabilization, and kiosk construction. Project R.10-3 would be located at Castlewood Golf Course and Country Club which is a privately owned recreation facility. Potential impacts to recreational facilities are discussed in **Impact 3.4.3**. Implementation of **Mitigation Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.7** through **3.9** would reduce potential construction-related impacts to less than significant levels. Five schools are located within this reach. School operations may be affected by construction activities. Zone 7 would consult with the Livermore Valley Joint Unified School District and Pleasanton Unified School District to coordinate activities if that occurs. Potential impacts to the operation of these schools would be reduced to less-than-significant levels with implementation of **Mitigation Measure 3.4.1e**.

Reach 11

Reach 11 is primarily made up of open space and agricultural lands. No sensitive receptors have been identified in this reach. Therefore, impacts to surrounding land uses from construction activities would be less than significant.

Reach 12

Reach 12 is primarily made up of agricultural lands. No sensitive receptors have been identified in this reach. Therefore, impacts to surrounding land uses from construction activities would be less than significant.

Mitigation Measures

Mitigation Measure 3.4.1a: Construction activities associated with project implementation shall occur Monday through Friday, between 8:00 a.m. and 5:00 p.m. This limitation would reduce disturbance (i.e., dust, noise, traffic) to adjacent land uses. Any construction that disrupts traffic within primary roadways shall be limited to weekdays during non-peak hours (see **Section 3.9, Traffic and Circulation**).

Mitigation Measure 3.4.1b: Zone 7 shall restore private access roads, driveways, and landscaped areas that would be affected by construction activities to their pre-project condition such that adverse effects to the physical conditions of the work sites would not result in continued disturbance or new safety hazards. Restoration of private property shall require negotiations between Zone 7 and private landowners.

Mitigation Measure 3.4.1c: Zone 7 shall restore public road right-of-ways and recreational facilities that would be affected by construction activities to their pre-project condition such that adverse effects to the physical conditions of the work sites would not result in continued disturbance or new safety hazards.

Mitigation Measure 3.4.1d: If project sites are located in a public right-of-way, Zone 7 or its contractors shall obtain and comply with encroachment permits for installation of facilities. In addition, Zone 7 shall provide the local jurisdiction with design drawings for review and comment at appropriate design stages.

Mitigation Measure 3.4.1e: If project locations are located adjacent to schools or community parks and centers, construction schedules shall be negotiated with the

respective school districts and affected agencies in an effort to minimize disturbance to school and community operations and programs. Where construction activities would affect scheduled programs, Zone 7 shall work with affected jurisdictions to establish alternative locations for activities curtailed by project construction. For those activities that are not able to be temporarily relocated due to special facility requirements, Zone 7 shall work with affected jurisdictions to establish alternative scheduling on evenings and weekends.

Additional mitigation measures are provided in **Section 3.7, Air Quality; Section 3.8, Noise; Section 3.9, Traffic and Circulation; Section 3.10, Hazardous Materials; Section 3.11, Public Services and Utilities; and Section 3.13, Visual Quality**. These sections specify measures to reduce dust, noise, access blockage, and public service impacts that would disrupt adjacent land uses.

Impact Significance after Mitigation: Less than significant.

Impact 3.4.2. Recreational Facility Use Disturbance: Project construction could result in disturbance of recreational facility uses. Less than Significant with Mitigation.

Regional and local recreational facilities are located throughout the Livermore-Amador Valley, within the 12 reaches. Trails (multi-use, pedestrian, and bicycle) and park facilities within the planning area are managed by East Bay Regional Park District (EBRPD), Livermore Area Recreation and Parks District (LARPD), and the Cities of Pleasanton, Dublin and Livermore. Impacts are primarily associated with temporary closures or restricted access to recreational facilities (parks or trails) during construction activities. Impacts to recreational facilities include impacts to users as well as partial closures to neighborhood and community parks. The type of impact that may occur if projects are sited in recreational facilities is construction impacts that would disturb recreational use and its users. The projects located at recreational facilities are shown in **Table 3.4-2** below.

No facility would be completely closed to use during project implementation. Direct construction impacts are associated with the partial closure or restricted access to a recreational facility for anywhere from 1 to 2 weeks to 8 months depending on project duration (see **Table 3.4-2**) if project sites are located on or adjacent to park uses. The construction zone would thus accommodate either the proposed project site or staging/storage of equipment, and may limit park/facility access, affect recreational activities or increase the potential for safety hazards. Zone 7 would obtain approval from the appropriate jurisdiction for development of site facilities within park boundaries (see **Mitigation Measure 3.4.2a**). Where playground or playing field facilities are located adjacent to the work zone, the area would be appropriately fenced to minimize safety hazards and signage would be installed to warn users of work activities, and/or to provide detours if an existing pedestrian/bicycle trails are affected. Scheduled recreational activities would be maintained to the extent feasible, and Zone 7 would coordinate with local park agencies and/or facility owners to ensure that minimal disturbance to existing activities occur (see **Mitigation Measure 3.4.2a**).

**TABLE 3.4-2
PROJECTS IN RECREATIONAL AREAS**

Project	Name	Recreational Facility	Jurisdiction/ Ownership	Construction Activities	Project Duration
R.1-1	Altamont Creek Improvements	Springtown Natural Communities Reserve	Private owner	Trail building, sediment basin construction, and sediment removal	2 weeks
R.1-2	Alkali Sink Management	Springtown Natural Communities Reserve	Private owner	Riparian projects, land acquisition	1 month
R.1-3	Springtown Improvements	Springtown Natural Communities Reserve	Private owner	Trail building, creation of low-flow channel, vegetation management	2.5 months
R.1-4	Springtown Golf Course Improvements	Springtown Natural Communities Reserve	Private owner	Sediment basin construction and riparian projects	3 months
R.3-2	Robertson Park Enhancement and Levee Construction Project	Robertson Community Park	City of Livermore	Trail building, vegetation management, bank stabilization, and kiosk construction	8 months
R.4-2	Sycamore Grove Park Trail Connections	Sycamore Grove Park	Livermore Area Parks and Recreation District (LAPD)	Trail building and riparian projects	1 ½ weeks
R.10-3	ADLL Improvement Project 3	Castlewood Country Club	Private owner	Trail building, riparian projects and bank stabilization	6 to 8 months

Construction activities would also affect the visual character of the park area. **Section 3.12, Visual Quality**, discusses the potential for construction of the project to affect surrounding visual resources. Restoration of the work site to integrate with surrounding environment would be implemented following construction. Implementation of **Mitigation Measure 3.4.1c** and measures identified in **Section 3.12, Visual Quality**, would reduce any potential temporary, direct, significant impacts to recreational facilities and their users to less than significant levels.

Indirect impacts are associated with increases in noise, dust, and safety hazards in the vicinity of the construction zone (see **Impact 3.4.1**). Measures identified in **Impact 3.4.1** above, **Sections 3.6, Air Quality, 3.7, Noise, and 3.8, Traffic and Circulation**, would reduce effects of increased noise (e.g., use of muffler on construction equipment), dust (e.g., watering work site for dust control), and pedestrian/bicycle circulation on trails (e.g., provision of warning signage of potential work).

Mitigation Measures

Mitigation Measure 3.4.2a: If projects are located within parks or other recreational facilities, Zone 7 shall notify and coordinate with affected jurisdiction to obtain approval for encroachment. To the extent feasible, construction activities shall be conducted in a

way that does not impair existing recreational uses in parks. In addition, Zone 7 or its contractors shall post signage within affected park areas describing the length of duration, time of construction activities, and contact person. Construction areas would be appropriately fenced, and equipment would be stored within the fence zone, to provide safety to park users.

Impact Significance after Mitigation: Less than significant.

Long-term Operational Impacts

Impact 3.4.3. Adjacent Land Use Disruption: Project implementation could result in long-term disruption to adjacent land uses, including incompatibility with existing land uses and increased dust, noise, traffic and other disturbance to surrounding land uses. Less than Significant.

The primary type of long-term impact applicable to SMMP projects is site-specific incompatibility with existing land uses. A limited number of project sites may potentially experience impacts associated with long-term operation of individual project facilities, such as increased foot traffic from recreational trails, or periodic sediment removal from individual sediment basins.

Once projects are implemented, they would create minimal noise, air, traffic, hazardous material, and visual-related impacts. **Section 3.7, Air Quality, Section 3.8, Noise, Section 3.9, Traffic and Circulation, Section 3.10, Hazardous Materials, and Section 3.13, Visual Quality,** present detailed analyses of the long-term effects of SMMP projects on adjacent land uses. Operational impacts would be localized around each project site. Operational impacts associated with specific projects are discussed below.

A large majority of SMMP projects do not involve facility construction. These projects fulfill goals relating to flood control, habitat restoration, water supply and water quality. Operation of such projects would not cause detrimental impacts to surrounding land uses.

The construction activities that may result in operational impacts to land use are trail building and kiosk construction. New trail construction, improvements, and connections between existing trails are significant components of many SMMP projects. Trail building and construction of educational kiosks could result in increased noise and traffic impacts to surrounding land uses. However increases in these effects are not expected to exceed established levels of significance for these resource areas. These types of construction activities are components of the following projects: R.1-1, R.1-2, R.1-3, R.1-4, R.1-5, R.1-6, R.1-7, R.2-1, R.2-3, R.3-2, R.3-4, R.3-5, R.4-2, R.5-1, R.6-1, R.6-2, R.7-1, R.7-2, R.7-3, R.8-1, R.8-2, R.8-4, R.9-5, R.10-1, R.10-2, R.10-3, R.10-4, R.10-5, and R.11-1. Noise and traffic impacts are addressed in **Sections 3.8, Noise and Section 3.9, Traffic and Circulation.**

Impact 3.4.4. Mineral Resources: Project implementation could result in loss of availability of the Chain of Lakes area, which is a known mineral resource of value to the region. Less than Significant. Less than Significant with Mitigation for Projects R.5-3 and R.6-2.

Major sand and gravel resources are located along the arroyos of the Livermore-Amador Valley. The State Mining and Geology Board designated over 5,800 acres in the planning area as “Regionally Significant Construction Aggregate Resource Areas”. These areas include the 3,280 acres between Pleasanton and Livermore, i.e., the Chain of Lakes area, which is located in the project area (Alameda County, 1993a). The Specific Plan for Livermore-Amador Valley Quarry Area Reclamation (Alameda County, 1981) is a part of the Alameda County General Plan for the 3,280-acre area designated for “sand and gravel quarry” use between Pleasanton and Livermore in the Livermore-Amador Valley Planning Unit General Plan, adopted in 1977. The Specific Plan was adopted on November 5, 1981 (Alameda County, 1981). This Specific Plan contains a coordinated reclamation plan for the quarry area with final reclamation of the entire area anticipated to occur by 2030. Over the 40-year period that sand and gravel resources are expected to last in the quarry area, the pit areas are to be shaped into a “Chain of Lakes” area, which would provide a surface water conveyance and groundwater recharge system that would be dedicated to Zone 7 (Alameda County, 1993a).

The California Department of Conservation, Division of Mines and Geology designates the Chain of Lakes area as MRZ-2(a)1, which is an area where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists (Stinson et al., 1982). However, according to the updated mineral land classification (CDMG, 1996) the Chain of Lakes area is listed as an area with “depleted resources”.

Since the General Plan has been adopted, cities of Pleasanton and Livermore and Alameda County have proposed or approved residential projects near or adjacent to the quarry areas or significant resource areas (including the Chain of Lakes area). The East County Area Plan proposes several preventive measures to help minimize the potential for conflict for future developments and quarry proposals (Alameda County, 1993b). The SMMP has been developed to be consistent with the East County Area Plan as well as the 1981 Specific Plan. As shown in Figure 2-18 in **Chapter 2, Project Description**, the SMMP maintains the use of a bypass channel around the future Lakes E, F and G, and proposes additional channel improvements (diversion channel and drainback channel) to route flows from this bypass channel and Arroyo Las Positas to Cope Lake and Lake G for retention storage. Implementation of these facilities are not anticipated to conflict with current or ongoing mining leases in the Chain of Lakes area. As noted in **Chapter 2, Project Description**, implementation of regional storage at Cope Lake, and channel capacity improvements within the Chain of Lakes area would provide increased flood protection to the Chain of Lakes area. As identified in mitigation below, Zone 7 would continue to coordinate with gravel mining operators and lease holders regarding implementation of regional flood control facilities within the Chain of Lakes area.

¹ (a) indicates the presence of an operating quarry within the mineral deposit is considered proof that the condition that
- the deposit must be composed of material that is suitable as a marketable commodity- is met.

Mitigation Measures

Measure 3.4.4: For Project R.5-3 and Project R.6-2, Zone 7 shall continue to coordinate with gravel mining lease holders and operators regarding design and implementation of regional flood control facilities in the Chain of Lakes area.

Impact Significance after Mitigation: Less than significant.

**TABLE 3.4-3
SUMMARY OF LAND USE IMPACTS BY PROJECT**

Reach/Project	Construction Impacts		Long-term Operational Impacts	
	Impact 3.4.1 Land Use Disturbance	Impact 3.4.2 Recreational Facility Use Disturbance	Impact 3.4.3 Adjacent Land Use Disruption	Impact 3.4.4 Mineral Resources
Reach 1				
R.1-1	LSM	LSM	LTS	n/a
R.1-2	LTS	LSM	LTS	n/a
R.1-3	LSM	LSM	LTS	n/a
R.1-4	LSM	LSM	LTS	n/a
R.1-5	LTS	n/a	LTS	n/a
R.1-6	LTS	n/a	LTS	n/a
R.1-7	LSM	n/a	LTS	n/a
Reach 2				
R.2-1	LSM	n/a	LTS	n/a
R.2-2	LTS	n/a	n/a	n/a
R.2-3	LTS	n/a	LTS	n/a
Reach 3				
R.3-1	LTS	n/a	n/a	n/a
R.3-2	LSM	LSM	LTS	n/a
R.3-3	LSM	n/a	n/a	n/a
R.3-4	LSM	n/a	LTS	n/a
R.3-5	LTS	n/a	LTS	n/a
Reach 4				
R.4-1	LTS	n/a	n/a	n/a
R.4-2	LSM	LSM	LTS	n/a
Reach 5				
R.5-1	LSM	n/a	LTS	LTS
R.5-2	LTS	n/a	n/a	LTS
R.5-3	LTS	n/a	n/a	LSM
Reach 6				
R.6-1	LTS	n/a	LTS	LTS
R.6-2	LSM	n/a	LTS	LSM
Reach 7				
R.7-1	LTS	n/a	LTS	LTS
R.7-2	LSM	n/a	LTS	LTS
R.7-3	LSM	n/a	LTS	LTS
Reach 8				
R.8-1	LSM	n/a	LTS	n/a
R.8-2	LTS	n/a	LTS	n/a
R.8-3	LSM	n/a	n/a	n/a
R.8-4	LSM	n/a	LTS	n/a
Reach 9				
R.9-1	LSM	n/a	n/a	n/a
R.9-2	LSM	n/a	n/a	n/a
R.9-3	LTS	n/a	n/a	n/a
R.9-4	LSM	n/a	n/a	n/a
R.9-5	LTS	n/a	LTS	n/a
R.9-6	LTS	n/a	n/a	n/a
R.9-7	LSM	n/a	n/a	n/a
Reach 10				
R.10-1	LSM	n/a	LTS	n/a
R.10-2	LSM	n/a	LTS	n/a
R.10-3	LSM	LSM	LTS	n/a
R.10-4	LSM	n/a	LTS	n/a
R.10-5	LTS	n/a	LTS	n/a

**TABLE 3.4-3 (continued)
SUMMARY OF LAND USE IMPACTS BY PROJECT**

Reach/Project	Construction Impacts		Long-term Operational Impacts	
	Impact 3.4.1 Land Use Disturbance	Impact 3.4.2 Recreational Facility Use Disturbance	Impact 3.4.3 Adjacent Land Use Disruption	Impact 3.4.4 Mineral Resources
Reach 11				
R.11-1	LTS	n/a	LTS	n/a
R.11-2	LTS	n/a	n/a	n/a
Reach 12				
R.12-1	LTS	n/a	n/a	n/a
R.12-2	LTS	n/a	n/a	n/a

SU = Significant and Unavoidable
LSM = Less than Significant with Mitigation
LTS = Less than Significant
N = No Impact n/a = not applicable

References – and Use

- Alameda County, Specific Plan for Livermore-Amador Valley Quarry Area Reclamation, 1981.
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- Alameda County, *East County Area Plan, Volume 1: Goals, Policies and Programs*, Adopted: May 5, 1994. Last amended: May, 2002.
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- California Division of Mines and Geology (CDMG), Designated Areas Update, Regionally Significant Construction Aggregate Resource Areas in the South San Francisco Bay Production-Consumption Region, Livermore Quadrangle, 1996
- City of Dublin, *General Plan*, Retrieved March 21, 2005 from http://www.ci.dublin.ca.us/Dublin_General_Plan.pdf. Last amended: November, 2002.
- City of Livermore, *General Plan*, Retrieved February 28, 2005 from http://www.ci.livermore.ca.us/general_plan/general_plan.html. 2004.
- City of Pleasanton, *General Plan*, August, 1996.

3.5 Biological Resources

3.5.1 Setting

Regional Setting

The SMMP project sites are located within and adjacent to intermittent and perennial creeks and flood control channels that traverse the alluvial Livermore-Amador Valley floor. As a result, wetlands and associated vegetation are present at most SMMP project sites.

As late as 1880, the major valley drainages converged to form an expansive natural lagoon known as Tulare Lake, in what is now the City of Pleasanton (Hanson, et al., 2004). By 1911, overflow bypass channels were created that diverted Arroyo del Valle and Arroyo Mocho during peak flow periods (Hanson, et al., 2004). By the mid-1900's, major land uses of the valley floor were cattle grazing and agriculture and major drainages were confined within defined channels, but subject to flooding during peak flows. More recently, urban development has displaced agricultural uses across much of the valley floor, and the need to regulate flows has become increasingly important. Lake del Valle accomplished some of the need for flood control. The conversion from agricultural to urban land uses also fragmented the landscape, thus limiting the distribution of wetlands and restricting the once widespread plant and wildlife habitat. Current land uses within the SMMP project area include agriculture, residential, commercial and industrial development, sand and gravel mining, open space, and suburban parks. Many of the general project locations identified for the SMMP projects are within defined creeks or flood control channels with at least one access road at the top of bank. With a few notable exceptions to be discussed in this section, the streams and channels considered in this MEIR are nearly all abutted by urban development.

Existing Environment

This section describes plant communities and associated wildlife habitats, special-status species, and waters of the U.S. in the SMMP area. Natural resources are presented and discussed within each of the 12 SMMP reaches. For the purposes of this discussion, vegetation resources include both common and sensitive plant communities and special-status plant species. Urban landscaping is included as a vegetation type, but is regarded as having marginal wildlife habitat value.

Existing Conditions by SMMP Reach

Existing conditions within each project reach are described in this section as defined by the general boundaries described in **Chapter 2.0, Project Description**. Information on natural habitats within each reach is based on file documents, recent biological surveys, a species list from the U.S. Fish and Wildlife Service (USFWS) (USFWS, 2004c), and a reconnaissance survey of each SMMP reach in fall 2004. Focused “protocol-level” field surveys were not conducted as part of this assessment; however, protocol surveys for California red-legged frog (*Rana aurora draytonii*) were conducted by Environmental Science Associates’ biologists in several of the project reaches between 2000 and 2005, and results are presented herein. A comprehensive list of

special-status plant and wildlife species in the SMMP project area is presented in **Table A.3.5-1** in **Appendix 3.5**. **Table A.3.5-2** in **Appendix 3.5** describes available habitat within each project reach as well as special-status species that are expected within each reach. A discussion of fisheries resources in the SMMP project is provided in **Section 3.6, Fisheries Resources**.

Reach 1

Reach 1 includes the Arroyo las Positas and Altamont Creek drainages, and Springtown Natural Community Reserve. The streams generally flow through residential neighborhoods and undeveloped open space, with gravel access roads and recreational trails at the top of bank in many areas. Within Reach 1, habitat in adjacent developed areas and city parks include urban landscaping, with freshwater emergent wetland, annual grassland, and ruderal habitats along reaches of Altamont Creek. Within the Springtown Natural Community Reserve and further upstream, east of Vasco Road, Altamont Creek flows through a narrow, unimproved channel dominated by cattails, rushes, and sedges. Potential jurisdictional waters and wetlands in Reach 1 occur within Arroyo las Positas, Altamont Creek, and at Springtown Natural Community Reserve.

The aquatic and riparian habitat associated with these creeks support or provide habitat elements for common reptiles and amphibians including western toad (*Bufo boreas*), Pacific chorus frog (*Pseudacris* [= *Hyla*] *regilla*), common garter snake (*Thamnophis sirtalis*), and gopher snake (*Pituophis melanoleucus*). Mammals such as western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Mus musculus*), opossum (*Didelphis marsupialis*), and raccoon (*Procyon lotor*) are expected to utilize streamside and adjacent upland habitats for nesting and foraging.

Grasslands and undeveloped upland habitats support a wide variety of common wildlife species. Blacktail jackrabbit (*Lepus californicus*), Audubon's cottontail (*Sylvilagus audubonii*), and Botta's pocket gopher (*Thomomys bottae*) are common in Reach 1. Small rodents in turn attract raptors (birds of prey) including red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), red-shouldered hawk (*Buteo lineatus*), and northern harrier (*Circus cyaneus*).

Wildlife species also widely use riparian fringes. Reptile species that are typical of the area include western fence lizard (*Sceloporus occidentalis*), western terrestrial garter snake (*Thamnophis elegans*), and western rattlesnake (*Crotalus viridis*). Principal game species in this habitat type include blacktail deer (*Odocoileus hemionus*), California quail (*Callipepla californica*), and mourning dove (*Zenaida macroura*).

High quality riparian woodlands that support willow scrub, such as the general location identified for Project R.1-6 may support ruby-crowned kinglet (*Regulus calendula*), bushtit (*Psaltiriparus minimus*), warbling vireo (*Vireo gilvus*), and yellow-rumped warbler (*Dendroica coronata*), among other common riparian bird species. Other birds that are expected to use the wooded portions of the riparian corridor and adjacent grasslands are Anna's hummingbird (*Calypte anna*), white-breasted nuthatch (*Sitta carolinensis*), house wren (*Troglodytes aedon*), and occasionally loggerhead shrike (*Lanius ludovicianus*). Many passerines (songbirds) use riparian vegetation in urbanized landscapes as stopovers during migration. Migratory songbirds generally frequent such

creek corridors—especially those areas with dense canopy vegetation—and may include yellow warbler (*Dendroica petechia*), common yellowthroat (*Geothlypis trichas*), and orange-crowned warbler (*Vermivora celata*).

Grasslands and alkali wetlands within the Springtown Natural Community Reserve support numerous special-status plant and wildlife species. Chief among these are the federally endangered palmate-bracted bird's-beak (*Cordylanthus palmatus*), California tiger salamander (*Ambystoma californiense*) and California red-legged frog (both federally threatened), western pond turtle (*Emys* [= *Clemmys*] *marmorata*) (a federal and California Species of Concern), and possibly the federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*).

Based on protocol-level California red-legged frog surveys conducted between 2001 and 2005, both California red-legged frogs and western pond turtle are widely distributed throughout all Reach 1 drainages (ESA, 2001a; 2001b; 2002; 2003; 2004a; 2004b; Pittman, pers. obs.). These species occur both upstream and downstream of the steeply channelized, concrete-lined portion of Altamont Creek located west of Vasco Road (ESA, 2001a; 2002; 2004a; 2004b; Pittman, pers. obs.). Within Reach 1, western pond turtles are expected to nest in grasslands and undeveloped upland areas within several hundred feet of Altamont Creek and Realigned Arroyo las Positas, especially within the Springtown Natural Community Reserve. Critical habitat for California red-legged frog was proposed by the USFWS on April 13, 2004 (USFWS, 2004a) and revised on November 3, 2005 (USFWS, 2005), and does not include any Reach 1 projects.

The federally endangered palmate-bracted bird's beak (*Cordylanthus palmatus*) occurs in the Springtown Natural Communities Reserve in close proximity to Projects R.1-1 and R.1-2. Proposed critical habitat for the California tiger salamander does not occur at any of the general locations identified for Reach 1, and is not discussed further in this section. Critical habitat for the vernal pool fairy shrimp (*Branchinecta lynchi*) (Unit 19c) is generally north of Reach 1, and includes portions of the Altamont Hills north and east of the SMMP project area (USFWS, 2003). Critical habitat for this species does not occur elsewhere in the SMMP project area.

Within Reach 1, the riparian corridor at the general location identified for Project R.1-7 has a low potential to support breeding bats. Other potential project areas in Reach 1 do not provide structures, mature trees, or other features that offer suitable nesting cavities. The Bluebell Drive bridge does not provide nesting opportunities for bats. Nesting birds, including Cooper's hawk (*Accipiter cooperii*) and sharp-shinned hawk (*Accipiter striatus*), may also be expected to nest in this area.

Reach 2

Reach 2 is within the Arroyo Seco and Realigned Arroyo las Positas drainages. This realigned portion of Arroyo las Positas supports dense growth of water cress (*Rorippa nasturtium-aquaticum*), water smartweed (*Polygonum* sp.), and cattails, although it lacks woody vegetation. Near Project R.2-1, the banks of this linear earthen channel primarily support non-native annual grassland species such as bristly ox tongue (*Picris echioides*) and wild oats (*Avena fatua*). Similar instream and bank conditions exist at the sites for Projects R.2-2 and R.2-3. Potential jurisdictional waters and wetlands occur within Arroyo Seco and Realigned Arroyo las Positas.

Common wildlife species that were observed or are expected to occur in Reach 2 are similar to those described for Reach 1, with an abundance of pacific trees frogs and western toads. However, Reach 2 channels lack wooded riparian canopy, thus bird diversity is relatively limited. Small mammals including blacktail jackrabbits and Audubon's cottontail are common within Reach 2 and attract a variety of foraging raptors. Raptor nesting sites are absent from the stream channels.

In fall 2000, Zone 7 conducted maintenance activities in Realigned Arroyo las Positas downstream from Vasco Road. At this time, 43 California red-legged frogs were relocated from a small part of the Project R.2-1 project area; indicating that this area is densely populated by this species (Pittman, pers. obs.). Also, several resident burrowing owls (*Athene cunicularia*) lived within 200 feet of the creek, but were displaced in 2000 and 2001 during construction of Payne Sports Park on Patterson Pass Road at Vasco Road (Pittman, pers. obs.). Proposed critical habitat for the California red-legged frog does not include any Reach 2 projects (USFWS, 2005). Both California red-legged frog and western pond turtle are expected to occur within the general locations identified for Projects R.2-2 and R.2-3. The California tiger salamander is not expected at Reach 2 project sites due to the absence of suitable breeding pools and aestivation sites.

Reach 3

Reach 3 projects are located in the upper Arroyo Mocho drainage. Adjacent to the riparian corridor, available habitat is somewhat impacted and includes commercial and residential development, undeveloped grasslands, and ruderal habitat in vacant parcels. This portion of Arroyo Mocho is a seasonal drainage with flows supplied by urban runoff and from planned upstream releases (e.g., from the California Department of Water Resource's South Bay Aqueduct [SBA] when available and scheduled by Zone 7). Habitat varies widely in the riparian corridor, but generally includes freshwater emergent wetlands, western sycamore (*Plantanus racemosa*) and willow riparian woodlands, mule fat (*Baccharis salicifolia*) scrub and coyote brush (*Baccharis pilularis*) scrub, bare unvegetated sand and gravel bars, and aquatic habitat associated with the stream channel. Potential jurisdictional waters and wetlands occur within Arroyo Mocho.

Common wildlife species associated with Arroyo Mocho include those described for Reach 1. The dense riparian woodland and scrub vegetation on this segment of creek likely support a variety of nesting songbirds and raptors. Arroyo Mocho is one of several streams in the SMMP area that has been identified as a candidate for fisheries restoration and enhancement activities following the removal of downstream migration barriers. Fisheries resources in Reach 3 are described in **Section 3.6, Fisheries Resources**.

The lush riparian habitat and perennial water in upper Arroyo Mocho provide suitable habitat for several special-status wildlife species, although their occurrence in Reach 3 has not been reported. Potential breeding habitat for California red-legged frog and western pond turtle occurs near the Stanley Boulevard Bridge, however frogs are likely absent in the area. Surveys of this area in 2001 and 2004 indicate that slow-moving and stagnant pools are solidly dominated by American bullfrog (*Rana catesbeiana*) and lack western pond turtles (ESA, 2001b; 2004a). None

of the general locations identified for Reach 3 projects are within proposed critical habitat for California red-legged frog (USFWS, 2005).

Large trees within the extensive riparian woodland community and degraded bridges may provide suitable roosting habitat for common and special-status bats including Townsend's western big-eared bat (*Corynorhinus townsendii townsendii*), long-legged myotis bat (*Myotis volans*), and Yuma myotis bat (*Myotis yumanensis*). Other special-status bat species identified in **Appendix 3.5** typically roost and nest in caves and rock crevices. Although roosting is not expected within the general locations identified for Reach 3 projects, it may occur sporadically in the region. The riparian community in this portion of Arroyo Mocho generally lacks dense woody thickets that would support San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*).

Reach 4

Reach 4 is associated with Arroyo del Valle and a tributary stream, South Tributary. Downstream from Lake del Valle, Arroyo del Valle flows northwesterly through the 735-acre Sycamore Grove Park and is the park's major hydrologic feature providing wetlands, seasonal ponds and tributary streams. The riparian vegetation in these streams consists of continuous canopy of mature western sycamore and valley oak (*Quercus lobata*), with patches of willow (*Salix* sp.), California black walnut (*Juglans nigra*), and Coast live oak (*Quercus agrifolia*). Potential jurisdictional waters and wetlands occur within Arroyo del Valle and South Tributary.

The Livermore Area Recreation and Park District has become increasingly concerned about the considerable die-off of western sycamore trees in Sycamore Grove Park over the last 30 years, including approximately half the specimens in the grove. Despite the general poor health and lack of regeneration in parts of the grove; some regeneration is occurring at certain locations along the east side of Arroyo del Valle.

The general location identified for Project R.4-2 includes annual grasslands near riparian habitats that could include the presence of special-status amphibians in upland areas. A broad range of wildlife species are associated with Arroyo del Valle and South Tributary, with similar habitat conditions found at the two drainages. These drainages support some of the densest and most diverse wildlife communities in the Livermore- Amador Valley. The diversity of plant species, multilayered vegetation and perennial water (in Arroyo del Valle) provides a variety of foods and microhabitat conditions that are ideal for wildlife. Mature willows, oaks, western sycamores, and other riparian trees provide high-quality raptor nesting habitat.

Cavity-nesting wildlife such as the downy woodpecker (*Picoides pubescens*), hairy woodpecker (*P. villosus*), northern flicker (*Colaptes auratus*), oak titmouse (*Baeolophus griseus*), white-breasted nuthatch (*Sitta carolinensis*), bats, and western gray squirrels (*Sciurus griseus*) require mature stands of trees, as found in riparian woodlands. California grape (*Vitis californicus*), blackberries (*Rubus* spp.), elderberries (*Sambucus* spp.), and oaks produce important fall and winter foods for birds and mammals. Common wildlife species that depend on the nectar, fruits, and seeds of riparian plants include Anna's hummingbird, spotted towhee (*Pipilo maculatus*), California towhee (*Pipilo crissalis*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), opossum (*Didelphis marsupialis*), and gray fox (*Urocyon cinereoargenteus*).

These communities also support an abundance of insect prey that feed on foliage and stems during the growing season. These insects, in turn, support a high density of migratory and resident birds, including the Pacific-slope flycatcher (*Empidonax difficilis*), western wood pewee (*Contopus sordidulatus*), yellow warbler, Townsend's warbler (*D. townsendi*), yellow-rumped warbler, Cassin's vireo (*Vireo cassinii*), warbling vireo, bushtit (*Psaltiriparus minimus*), and house wren (*Troglodytes aedon*). Other bird species typically observed in riparian woodland habitats include dark-eyed junco (*Junco hyemalis*), chestnut-backed chickadee (*Poecile rufescens*), and brown creeper (*Certhia americana*). Riparian woodland areas also support piscivorous or fish-eating birds such as the belted king fisher (*Ceryle alcyon*). Raptors such as sharp-shinned hawk, Cooper's hawk, and red-shouldered hawk nest in the high canopy and feed on smaller birds and amphibians.

Wildlife species from nearby grassland habitats are also expected in the riparian fringe, and include western fence lizard, western terrestrial garter snake, western rattlesnake and wild turkey (*Meleagris gallopavo*). Mammals within this habitat include black-tailed jackrabbit, western harvest mouse, California vole, coyote, and blacktail deer.

The South Tributary includes emergent cattail wetlands that potentially provide breeding habitat for California red-legged frog. In 2003, adult California red-legged frogs were identified at two locations in the South Tributary upstream from the proposed turnout location: at its intersection with the SBA and in a freshwater seep several hundred further upstream (Pittman, pers. obs.; California Department of Fish and Game [CDFG], 2005). California red-legged frogs are also known to occur in Arroyo Del Valle and along South Tributary at the edge of Sycamore Grove Park. Proposed critical habitat for California red-legged frog occurs at the general locations identified for Projects R.4-1 and R.4-2 (USFWS, 2005).

An active California tiger salamander breeding pool is located immediately east of the Zone 7 Del Valle Water Treatment Facility, roughly 1,800 feet east of the general location identified for Project R.4-1 (Gan, 2001). The vernal pools and seasonal ponds within Sycamore Grove Park also provide breeding habitat for this species. Depending on the availability of suitable nearby breeding pools, upland areas in and surrounding this area may provide suitable upland aestivation sites for California tiger salamander.

Reach 4 falls within the known distribution of the western pond turtle and this species is known to occur in Sycamore Grove Park and Arroyo del Valle. South Tributary and stock ponds near its upper reach provide year-round habitat for the western pond turtle. This species may utilize the tributary as a dispersal corridor, moving to and from Arroyo del Valle depending on aquatic conditions. Based on the available habitat, this species is expected to occur wherever there is ponded water in Arroyo Del Valle and its tributaries, including South Tributary.

The dense riparian growth and dense woody thickets in Sycamore Grove Park and South Tributary may potentially support San Francisco dusky-footed woodrat. The upper reaches of South Tributary are generally contiguous with large expanses of San Joaquin kit fox habitat to the south, though the general location identified for Project R.4-1 adjacent to the riparian corridor does not provide habitat for this species. A review of several South Tributary areas in 2003

identified numerous California ground squirrel (*Spermophilus beecheyi*) burrows in grasslands habitat, although larger burrows suitable for kit fox were not observed.

Reach 5

Reach 5 includes portions of Arroyo las Positas and its tributaries located north and south of Kitty Hawk Road near the Las Positas Golf Course. Arroyo las Positas and its tributaries in Reach 5 can be characterized into three categories: heavily grazed native streams (Cottonwood Creek, Collier Creek, and Cayetano Creek), channelized earthen trapezoidal channels that support dense cattail growth (Arroyo las Positas between Kitty Hawk Road and Airway Boulevard), and well-developed natural areas that support mature willow riparian habitat (Arroyo las Positas downstream from Airway Blvd). Due to grazing in Cottonwood Creek, Collier Creek, and Cayetano Creek, riparian vegetation is limited to sparse emergent wetlands, mainly cattails and sedges that line the water's edge.

Arroyo las Positas differs widely upstream and downstream from Airway Blvd., which separates the upstream maintained stream channel from natural areas in Arroyo las Positas Golf Course. Upstream from Airway Blvd and continuing to Kitty Hawk Road, Arroyo las Positas is a wide flood control channel that is dominated almost exclusively by cattails. This stream is not channelized downstream from Airway Blvd, and supports an extensive and diverse willow riparian community within the Las Positas Golf Course and continuing further downstream. Potential jurisdictional waters and wetlands occur in Cotton Creek, Collier Creek, Cayetano Creek and Arroyo las Positas.

Common wildlife species in these streams are typical of aquatic stream habitats in upstream portions of Arroyo las Positas, described previously.

Special-status wildlife species documented or expected to occur in the local project vicinity include: California red-legged frog, which has been documented from Collier Creek, Cayetano Creek, and Arroyo las Positas both upstream and immediately downstream from the project area (CDFG, 2005); burrowing owl, which have been documented near lower Cayetano Creek, and may presumably occur near Collier Creek and Cottonwood Creek; California tiger salamanders, documented from undeveloped grasslands near lower Cottonwood Creek, Collier Creek and Cayetano Creek; and for project components located north of I-580, Congdon's tarplant (*Hemizonia parryi* ssp. *condonii*) (a federal Species of Concern), San Joaquin salt bush (*Atriplex joaquiniana*) and other special-status plants (see **Appendix 3.5**).

Proposed critical habitat for California red-legged frog occurs at the general locations identified for Project R.5-1 (USFWS, 2005). California fairy shrimp (*Linderiella occidentalis*) (a federal Species of Concern) is documented within one mile of the general locations identified for Reach 5 projects; however, vernal pool habitat that would support this species is lacking in Reach 5.

Reach 6

Reach 6 consists of the Chain of Lakes complex located south of Arroyo las Positas Golf Course, including Lakes E, F, G, H, and I. Reach 6 also includes a planned diversion structure that was analyzed in a separate CEQA document in 2002. The seasonally dry portion of Arroyo Mocho adjacent to the Chain of Lakes has a cobble bottom and supports only scant riparian vegetation and limited emergent vegetation. The stream banks are lined with dense stands of bluegum eucalyptus (*Eucalyptus globulus*), which contribute to a general lack of understory species along this stream reach. Potential jurisdictional waters and wetlands occur within Arroyo Mocho and Cope Lake.

The Chain of Lakes complex is highly beneficial to shorebirds, gulls, waterfowl and other avian species that frequent the shallower lakes, such as Cope Lake. These birds presumably feed on the numerous aquatic invertebrates and non-native sport fish in the excavated lakes.

Although not documented from the Chain of Lakes area, great blue heron (*Ardea herodias*) are known to breed in eucalyptus groves that border undisturbed aquatic habitat and could potentially occur in the project area. Breeding colonies of this species are protected by the CDFG. Raptors and a variety of resident and migratory birds may also nest in the eucalyptus grove. Rural grassland communities in the project vicinity may support breeding burrowing owl populations, which have been documented at the Livermore Municipal Airport (CDFG, 2005).

There is a low likelihood that the California red-legged frog would occur in the dry Arroyo Mocho channel based on the lack of native habitats and dry conditions in Arroyo Mocho in Reach 6. The general locations identified for Reach 6 projects are not within proposed critical habitat for California red-legged frog (USFWS, 2004a). California tiger salamanders are probably absent from this area based on the lack of suitable breeding sites within 1.25 miles.

Reach 7

Reach 7 includes the lower portion of Arroyo del Valle, which supports a broad, mature riparian community and has perennial stream flows. This area includes Chain of Lakes A, B, C and D and Shadow Cliffs. Annual grasslands habitat is located on the fringes of Lakes A and B, with similar habitat south of Arroyo del Valle. Potential jurisdictional waters and wetlands occur within Arroyo del Valle.

The lower portion of Arroyo del Valle supports a dense riparian forest with Fremont's cottonwood (*Populus fremontii*), California black walnut, arroyo willow, and western sycamore. Beneath the often dense canopy, California blackberry (*Rubus californica*) and the non-natives periwinkle (*Vinca major*) and English ivy (*Hedera helix*) line the lower bank areas. Beyond the canopy, banks support dense patches of fennel (*Foeniculum vulgare*), poison hemlock (*Conium maculatum*), and non-native grasses including pampas grass (*Cortaderia selloana*), Harding grass (*Phalaris aquatica*), and wild oats. The channel banks are very steep and the channel depth is relatively deep in much of Arroyo del Valle. A gravel road and residential development border the channel to the north through the lower portion of the stream. Residential and commercial developments border the channel to the south. Near the Chain of Lakes, the stream channel is

bordered by undeveloped annual grasslands habitat and the Chain of Lakes complex. Arroyo del Valle has a dense riparian canopy and deep, slow-moving water for most of the year.

Although development has encroached to the fringe of riparian habitat in the lower portions of this reach, the wildlife community is complex, and similar to that described in the riparian communities in Reach 4. The entire reach of Arroyo del Valle within Reach 7 provides nesting habitat for passerine birds and raptors.

California red-legged frog surveys conducted in lower Arroyo del Valle in 2001, 2002, 2003, and 2004, did not identify this species but detected numerous bullfrogs in the warm, slow-moving waters (ESA, 2001b; 2002; 2003; 2004). California red-legged frogs should be considered present, although based on survey results, the species is considered to have a low likelihood of occurrence in this area. The general locations identified for Projects R.7-1 and R.7-2 are within proposed critical habitat for California red-legged frog (USFWS, 2005).

The entire length of Arroyo del Valle provides habitat for western pond turtle, which may nest in upland areas and bask along stream banks. The mature cottonwood woodlands may also support bat roosting.

Arroyo del Valle is one several streams in the SMMP area that has been identified for fisheries restoration activities (i.e., stream corridor restoration). Fisheries resources are described in detail in **Section 3.6, Fisheries Resources**.

Reach 8

Reach 8 is located within maintained flood control channels in the cities of Pleasanton and Dublin. These include lower Arroyo Mocho and Arroyo de la Laguna, lower Tassajara Creek, and lower Chabot Canal. Potential jurisdictional waters and wetlands occur in each of these streams. These areas can be characterized as earthen, channelized, trapezoidal channels that measure between 15 and 30-feet wide at the base of slope and 60 to 100-feet wide at the top of bank. Upstream from its confluence with Arroyo las Positas, Arroyo Mocho is normally dry in summer and fall months; however, this portion of the stream is subject to erratic water releases related to gravel mining activities.

The distribution of wetland vegetation is restricted in these drainages due to seasonally intense flows, regular maintenance, and channel designs that promote a relatively uniform channel bottom. Typical wetland vegetation is restricted to a narrow fringe of annual emergent species such as cattails, water cress, and curly dock (*Rumex crispus*), which grow along the channel edges. A number of low-growing subdominant plants occur intermittently in these channels and include umbrella sedge (*Cyperus eragrostis*), rabbit's foot grass (*Polypogon monspeliensis*), and water smartweed. There is no woody streamside vegetation in any of the Reach 8 drainages. Slow-moving water in these streams during summer and fall months promotes thick algal blooms that may cover between 20 to 80 percent of the water surface.

Upland habitats vary, but typical dominants in these areas are Harding grass, fennel, wild oats, Italian ryegrass (*Lolium multiflorum*), Italian thistle (*Carduus pycnocephalus*), cockle burr (*Xanthium strumarium*), and wild radish (*Raphanus sativus*).

The extensive flood-control channels in Reach 8 are active breeding sites for mallard (*Anas acuta*), black-crown night heron (*Nycticorax nycticorax*), and red-winged black-bird (*Agelaius phoeniceus*), and provide year-round habitat for these and other birds such as great egret (*Ardea alba*) and snowy egret (*Egretta thula*). Killdeer (*Charadrius vociferous*) nesting occurs frequently in this area on infrequently used bare gravel access roads (Pittman, pers. obs.). Barn swallow (*Hirundo rustica*), cliff swallow (*Petrochelidon pyrrhonota*), and black phoebe (*Sayornis nigricans*) opportunistically nest under bridges throughout the lower flood control channel network.

During California red-legged frog surveys between 1997 and 2004, the streams in Reach 8 were observed to have generally uniform bottom contours with few pools, though isolated pockets with deeper water (greater than 12 inches) are able to persist through fall months (Pittman, pers. obs.).

Focused biological surveys were conducted in Arroyo Mocho, Tassajara Creek, and Chabot Canal in 1997; with additional surveys between 2001 and 2004 in Reach 8 streams including Arroyo de la Laguna (ESA, 1997; 2001a; 2002; 2003; 2004). These studies found that the lower stream channels are principally dominated by non-native fish and wildlife species, although numerous native species are also present. During peak winter flows, bullfrog larvae were able to persist in the many concrete energy dissipation structures along these streams. In late winter when flows subsided, bullfrogs utilized the main channels for breeding.

California red-legged frogs have not been identified in the past 25 years in any of the City of Pleasanton's major urbanized creeks or flood control channels, and they are presently not reported from the City of Dublin's flood control channels (CDFG, 2005). Although the aquatic habitat appears outwardly suitable for California red-legged frog, based on consecutive focused surveys, the lower portions of these flood control channels provide only poor quality aquatic habitat for this species. The general locations identified for proposed projects in Reach 8 are not located within proposed critical habitat for California red-legged frog (USFWS, 2005).

The western pond turtle is not documented in the lower reaches of streams in Reach 8, however should be presumed present in areas with suitable aquatic habitat. Such habitat is available in Arroyo Mocho and Arroyo de la Laguna based upon numerous red-eared slider turtle (*Pseudemys scripta*) observations in Arroyo de la Laguna and nearby Alamo Canal (see Reach 9, below) (Pittman, pers. obs.).

Reach 9

Reach 9 includes Alamo Canal and its tributaries in the cities of Pleasanton and Dublin. These areas of Alamo Canal can be characterized as earthen, channelized, trapezoidal channels that measure between 15 and 30-feet wide at the base of slope and 30 to 100-feet wide at the top of bank. Potential jurisdictional waters and wetlands occur in Alamo Canal and each tributary.

Ecological conditions in Alamo Canal and South San Ramon Creek are similar for projects R.9-1, R.9-3, R.9-5, R.9-6, and R.9-7. In these areas, South San Ramon Creek and Alamo Creek are large channelized, trapezoidal perennial streams that vary between 15 to 30 feet wide. During focused wildlife surveys in 2003 and 2004, these silt-lined drainages varied in depth from 1- to 2-feet deep during summer months. Sparse riparian vegetation provides about 5 percent water coverage along the shoreline and is limited primarily to umbrella sedge and other sedges, rabbit's foot grass, and water smartweed. Floating algae covers between 0 to 40 percent of the water surface through the year (ESA, 2003; 2004a). Industrial and commercial development comes within 15 feet of the top of bank throughout much of this reach. Undeveloped areas with annual grasslands dominate upland habitats near the general location identified for Project R.9-1. Upland habitats and bank vegetation in these areas consist primarily of wild oats, Harding grass, and ryegrass. Woody vegetation does not occur in the channels, on banks, or in upland areas along these project reaches. The general location identified for Project R.9-6 provides somewhat deeper habitat, particularly in portions of Line G-1-1 north of Stoneridge Drive. This flood control channel has generally poor wildlife conditions, but supports waterfowl breeding throughout its length and supports red-eared slider turtles north of Stoneridge Drive.

Project R.9-2 is located on flood control Line F-4. This narrow, low-quality channel is roughly 4- to 6-feet wide at the toe of slope and receives runoff from residential areas located north of Alamo Canal. This narrow drainage channel immediately abuts neighboring residences. The east side of the channel supports a narrow gravel access road. Emergent vegetation is mostly absent from this small drainage and floating algae covers substantial portions of water surface during summer and fall months. The creek banks are vegetated with ryegrass, wild oats, poison hemlock, and other non-native species. This drainage is separated from Alamo Canal by a large concrete apron that inhibits wildlife movement between the two drainages. Wildlife benefits in this drainage are considered poor. Wildlife species in Line F-4 include mosquito fish (*Gambusia affinis*), crayfish, and piscivorous birds that prey on these species. Mallard breeding occurs in the lower 1,000 feet of this drainage.

Line J-3 (Project R.9-3) is a small trapezoidal channel with restricted flows and sparse vegetation. The channel walls are concrete, with a native gravel stream bottom. Woody vegetation does not occur in this portion of the drainage.

The general location identified for Project R.9-4 at Line T is a seasonal drainage that supports a complex riparian forest community. Canopy species in this area include valley oak (*Quercus lobata*), big-leaf maple (*Acer macrophyllum*), California buckeye, California bay laurel (*Umbellularia californica*), and willow. Within the channel, understory species on stream banks include mint (*Salvia* sp.), dwarf nettle (*Urtica urens*), poison oak (*Toxicodendron diversilobum*), and California blackberry, with narrow-leaved cattail, umbrella sedge, and water smartweed near the waterline.

With the exception of the general location identified for Project R.9-4, Reach 9 drainages are characterized as slow-moving perennial streams with carp (*Cyprinus carpio*), crayfish, and other warm water species present in the larger streams (South San Ramon Creek and Alamo Canal) and mosquito fish in the small canals. Waterfowl nest and roost throughout the channel system.

As in Reach 8, the extensive flood-control channels in Reach 9 are active breeding sites for a variety of waterfowl and songbirds. During protocol-level surveys in Reach 9 drainages between 2001 and 2004, California red-legged frogs were not identified in lower Alamo Creek or any of its tributaries (ESA, 2001; 2002; 2003; 2004a). Based on survey results and the absence of frog source populations within one mile, this species is unlikely to occur in Reach 9 drainages; however, it should not be excluded from further consideration in this area. Habitat for California tiger salamander does not occur in this reach due to the absence of suitable breeding sites and source populations. Reach 9 projects are not located within proposed critical habitat for California red-legged frog (USFWS, 2005). The larger channels in Reach 9 provide suitable breeding and basking habitat for western pond turtle.

Reach 10

Reach 10 includes the entire length of Arroyo de la Laguna from Interstate-680 (I-680) to its downstream confluence with Alameda Creek. Downstream from I-680, this broad, warm water stream supports several distinct habitats including mature riparian forest, an extensive sycamore riparian woodland, and willow scrub. A broad alluvial floodplain is present downstream from the Castlewood Golf Course and continues into Alameda Creek. Potential jurisdictional waters and wetlands occur along the entire reach of Arroyo de la Laguna.

Mixed riparian forest and sycamore riparian forest occur throughout Arroyo de la Laguna, however, the mixed forest is most extensive in the upper-third of Arroyo de la Laguna in areas where the flows are defined within a permanent channel (e.g., near the general location identified for Projects R.10-1 and R.10-2). Riparian forests occupy the area from the edge of the creek (i.e., ordinary high water) to the top of bank. It is dominated by various species of willows, including arroyo willow (*Salix lasiolepis*), red willow (*S. laevigata*), and black willow (*S. goodingii*), in association with several other riparian trees, such as alder (*Alnus rhombifolia*), California black walnut (*Juglans californica*), big-leaf maple (*Acer macrophyllum*), and buckeye (*Aesculus californicus*). Black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) and sycamore also form a major component of this community.

Sycamore riparian woodland occurs on the banks and terraces along the lower two-third portion of Arroyo de la Laguna (the general location identified for Projects R.10-3 through R.10-5). The lower and upper terraces are dominated by large California sycamore, Fremont cottonwood, and willow, white alder, big-leaf maple, and California black walnut. The understory consists of a mix of riparian shrubs, such as mulefat and California blackberry with non-native grasses and primarily non-native herbaceous species, including ripgut brome (*Bromus diandrus*), bur clover (*Medicago polymorpha*), stinging nettle (*Urtica dioica* ssp. *holoserica*), white sweetclover (*Melilotus alba*), wild radish (*Raphanus sativus*), and vetch (*Vicia* sp.).

Willow riparian scrub consists of dense, nearly impenetrable stands of willows and many of the same woody species. This vegetation occurs in intermittent patches along the immediate shoreline of Arroyo de la Laguna, and is most extensive on broad gravel bars. Willow riparian scrub occupies sites that are more frequently disturbed by high flows and reconfiguration of the channel

bed and banks, which often precludes the development of mature trees and greater structural complexity in the canopy.

Riparian woodland (includes mixed riparian, willow riparian scrub, and sycamore riparian woodland) habitats provide food, water, migration and dispersal corridors, breeding sites, and thermal cover for wildlife and can support many resident and migratory wildlife species. The common wildlife species that were observed and are expected to occur in Arroyo de la Laguna are similar to those described for Reach 4 in Sycamore Grove Park.

Focused surveys for California red-legged frog in upper Arroyo de la Laguna and downstream in Alameda Creek near Sunol Dam (SFPUC, 2003) indicate that California red-legged frogs actively breed in off-channel ponds near the creek. Though red-legged frogs may occur throughout this drainage, favorable breeding is generally located in off-channel pools and ponds in the lower two-third of Reach 10, roughly downstream from Verona Road. Cobble-lined reaches near Project R.10-5 may support foothill yellow-legged frog (*Rana boylei*), a federal and California Species of Concern. Projects R.10-3, R.10-4, and R.10-5 are not located within proposed critical habitat for California red-legged frog (USFWS, 2005).

Suitable breeding sites for California tiger salamander do not occur in the Arroyo de la Laguna riparian corridor, though breeding sites may be available outside of the corridor near the general location identified for Projects R.10-4 and R.10-5. Pending further investigation of grazed rural lands surrounding these project areas, grassland habitats near the riparian corridor are considered to provide potential upland aestivation sites for California tiger salamander.

The California Natural Diversity Database (CNDDB) (CDFG, 2005) identifies western pond turtle in and near Alameda Creek, and this species presumably occurs throughout Arroyo de la Laguna. Turtle basking and breeding habitat occurs throughout Reach 10 in Arroyo de la Laguna, particularly in portions of the stream that provide deep pools with available basking areas on rocks and logs (such as near the Castlewood Drive bridge).

As identified for Reach 4, the mature riparian forest in lower Arroyo de la Laguna provides excellent breeding habitat for a wide variety of resident and migratory birds, and raptors.

The dense riparian growth and dense woody thickets along Arroyo de la Laguna may potentially support San Francisco dusky-footed woodrat. Mature sycamore and cottonwood trees that line the riparian corridor, as well as the many railroad bridges provide suitable nesting sites for common and special-status bats.

Reach 11

The general location identified for projects within Reach 11 include an abandoned railroad alignment, existing unmaintained roads beyond the upper banks of Alameda Creek, and Sinbad Creek. These areas are in close proximity to Alameda Creek. Potential jurisdictional waters and wetlands occur in Alameda Creek and Sinbad Creek.

With the exception of existing roads and right-of-ways (e.g., the railroad), the stream corridor supports a diverse and undisturbed riparian woodland. Beyond the riparian corridor in this area, habitats include coyote brush scrub and northern coastal scrub, with elements of the riparian forest on steep, north-facing slopes. Black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) is a major component of the riparian community in portions of Alameda Creek in Reach 11. These 80 to 100-foot tall trees exceed the lower continuous canopy, adding a layer of habitat structure that is not seen in other project reaches and is not often part of riparian habitats in the region. Below the tree canopy, a relatively dense stratum of shrubs and sapling trees forms a third layer of structure consisting of California blackberry (*Rubus ursinus*), mulefat (*Baccharis salicifolia*), California wild rose (*Rosa californica*), sedge rush (*Juncus* spp.), and western sword fern (*Polystichum munitum*). This community supports very little herbaceous understory due to low light conditions at the soil surface (suppressing seed germination). This early seral community may succeed to any of several riparian woodland or forest types in the absence of flooding disturbance.

For a discussion of common wildlife species associated with the Alameda Creek riparian corridor and Sinbad Creek, please see the discussion of Sycamore Grove Park (Reach 4) and Arroyo de la Laguna (Reach 10), which provide similar wildlife habitat.

California red-legged frog breeding has been recently documented adjacent to Alameda Creek in “sag ponds” within the riparian corridor, located upstream from Sunol Dam (SFPUC, 2003). Due to the swift current and seasonally flashy flows in Alameda Creek, successful breeding in the stream channel would be expected only during years with low winter stream flows. Foothill yellow-legged frogs are found throughout Alameda Creek and Niles Canyon (Trihey & Associates, Inc. 2001). Habitat for this species is generally confined to the direct stream channel and associated riparian corridor. The general locations identified for Projects R.11-1 and R.11-2 are not within proposed critical habitat for California red-legged frog (USFWS, 2005).

Alameda Creek does not provide breeding habitat for California tiger salamander due to its swift current. However, some grassland areas along the creek provide potential upland aestivation habitat for this species. The distribution of potential breeding sites in the area, such as stock ponds was not assessed.

The CNDDDB (2005) reports the presence of western pond turtle near Alameda Creek and this species presumably occurs throughout larger streams in the area. Turtle basking and breeding habitat occurs throughout Reach 11.

Although chaparral/scrub suitable habitat occurs within one mile, the project corridor generally provides only sparse habitat for the federally threatened Alameda whipsnake (*Masticophis lateralis euryxanthus*). This species has been observed to travel far from its typical northern scrub habitat (USFWS, 2000). Scrub habitat occurs in small clusters on the steep slopes above and immediately south of Alameda Creek. Habitat for the species is outside the general location identified for project activities. Designated critical habitat for the Alameda whipsnake was withdrawn on May 15, 2003 by U.S. District Judge Anthony Ishii and has not been reinstated.

As identified for Reach 4, the mature riparian forest provides excellent breeding habitat for a wide variety of resident and migratory birds, and raptors. Species that may nest in the riparian corridor or aquatic habitats associated with Alameda Creek include tricolored blackbird (*Agelaius tricolor*), Bell's sage sparrow (*Amphispiza belli belli*), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), and loggerhead shrike.

At least one great blue heron nesting colony is present on the banks of Alameda Creek (Pittman, pers. obs.). At this location any created trail would likely traverse the opposite (north) side of Alameda Creek within 250-feet of the heron colony. Great blue heron nesting colonies are particularly sensitive to human disturbance.

The dense riparian growth and dense woody thickets of Alameda Creek most likely support San Francisco dusky-footed woodrat. During the surveys, at least five massive woodrat stick nests were observed in the riparian woodlands upstream from Sunol Dam (B. Pittman, pers. obs.). Presence of woodrat was not verified, however, this species should be presumed present within the vegetated riparian corridor.

Mature sycamore and cottonwood trees, exposed rock outcrops, and the large dams and railroad bridges in this project area provide suitable nesting sites for common and special-status bats. Habitat for the following special-status bats occurs in the Alameda Creek corridor: Yuma myotis bat (*Myotis yumanensis*), greater western mastiff bat (*Eumops perotis californicus*), small-footed myotis bat (*Myotis ciliolabrum*), long-eared myotis bat (*Myotis evotis*), and fringed myotis bat (*Myotis thysanodes*).

Reach 12

Reach 12 includes two unmaintained seasonal streams in the rural hills separating the Livermore-Amador Valley from the Central Valley. Both of these streams support willow scrub habitat that traverse grazed and ungrazed annual grasslands habitat. Potential jurisdictional waters and wetlands occur in both drainages.

California annual grassland is the most common vegetation community in the Altamont Hills and is often found in areas that have been grazed or otherwise converted to crop agriculture. This community is widespread in Reach 12 and varies from disturbed ruderal vegetation to relatively intact grassland communities. The most common species found in this community include wild oats, ripgut brome (*Bromus diandrus*), yellow star thistle (*Centaurea solstitialis*), fescue (*Vulpia myurus*), filaree (*Erodium* sp.), and mustards (*Brassica* sp. and *Hirschfieldia* sp.). Native wildflowers may also occur within the annual grassland community and these species may include fiddleneck (*Amsinkia* sp.), lupine (*Lupinus* sp.), popcorn flower (*Plagiobothrys* sp.), and California poppy (*Eschscholzia californica*).

Arroyo willow habitat occurs in dense stands along the stream banks in both reaches. This vegetation community is characterized by riparian scrub dominated by arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*).

The curve-footed hygrotus diving beetle (*Hygrotus curvipes*) is a federal Species of Concern that may potentially occur in the drainages adjacent to the general location identified for Projects R.12-1 and R.12-2. This beetle is known to occur in both fresh and brackish waters of small mineralized ponds, alkali vernal pools, and intermittent creek channels. This species has been collected from small, drying, mineralized pools formed by winter rains, and small ponds and pools in intermittent streams.

Suitable aquatic habitat that may support California red-legged frog and California tiger salamander occurs at the general location identified for Projects R.12-1 and R.12-2. These species are expected to breed in the myriad local stock ponds, with red-legged frogs aestivating in project area stream corridors and California tiger salamander distributed in small mammal burrows in grasslands. Portions of seasonal drainages with standing or running water may also be used by western pond turtles, which migrate locally between pools and ponds. This species may potentially occur in intermittent drainages in Reach 12. The general locations identified for Projects R.12-1 and R.12-2 are within proposed critical habitat for California red-legged frog (USFWS, 2005).

The grassland and willow riparian habitat in this area may support numerous special-status bird species. Those species that may be associated with the riparian corridor include short-eared owl (*Asio flammeus*), a state Species of Special Concern that inhabits freshwater and saltwater marshes and grasslands with nearby tall vegetation and good cover; loggerhead shrike, a federal and state Species of Concern that nests in dense thickets; and tricolored blackbird, an infrequent colonial nester that breeds near fresh water, preferably in emergent wetlands with tall, dense cattails or tules but also in thickets. Birds associated with grasslands may include California horned lark (*Eremophila alpestris actia*), a California Species of Special Concern that nests in short grasslands, and northern harrier, a state Species of Concern that nests on the ground near aquatic habitats.

Burrowing owl habitat is considered excellent in Reach 12 due to the abundant California ground squirrel populations located throughout the area. This species should be presumed present near the general location identified for Reach 12 projects.

San Joaquin kit fox has the potential to occur throughout Reach 12, based on the local abundance of prey species, the availability of subterranean refugia sites, and site contiguity with occupied habitat for this species. Grassland habitat with an abundance of small mammal activity was identified in the general location of Reach 12 projects.

The distribution of special-status plants within grasslands habitat in Reach 12 is not known. A focused botanical survey should be conducted of project areas in Reach 12 for all the species identified in **Appendix 3.5**.

3.5.2 Regulatory Framework

A discussion of local, state and federal regulations that pertain to biological resources in the SMMP project area is presented in **Appendix 3.5**.

3.5.3 Biological Resources Impacts and Mitigation Measures

Significance Criteria

Based on policy and guidance provided by CEQA (Public Resources Code Section 21001 and CEQA Guidelines), an impact of the proposed project would be considered significant at the MEIR level if it causes one or more of the following effects:

- Adverse substantial effect to any species identified as a threatened, endangered, candidate, sensitive, or special-status species in local or regional plans, policies, regulations or by lists of species of concern from the CDFG, the USFWS or as defined by Section 15380 of the CEQA Guidelines;
- Adverse substantial effect to habitat (including habitats for rare and endangered species as defined by Fish and Game Code 903) or other sensitive natural community identified in local or regional plans, policies, regulations or by lists compiled by CDFG or USFWS;
- Adverse substantial effect to federally protected wetlands (including but not limited to marshes and riparian areas) as defined by Section 404 of the Clean Water Act, or riparian and marsh areas under the jurisdiction of CDFG as defined by Fish and Game Codes 1601–1603;
- Substantial interference with movement of any native resident or migratory fish or wildlife species or with established migration or dispersal corridors;
- Removal or damage to any protected tree;
- Damage to a resource that is subject to the U.S. Army Corps of Engineers (Corps) permit requirements under Section 404 of the federal Clean Water Act and that may provide valuable wildlife habitat, such as habitat for special-status plant or animal species; or
- Conflicts with any applicable habitat conservation plan.

Impacts and Mitigation Measures

Nearly all of the biological resource impacts from the proposed SMMP projects would be incurred during the project implementation (i.e., construction) phase of the SMMP, with few exceptions. However, in a few instances a potential impact is expected to remain following construction and taper off over time, and in other cases the magnitude may increase. As an example of the former case, as vegetation gaps in the stream network become vegetated over time, the effects of habitat fragmentation are expected to diminish. Still other impacts may increase over time. For example, the creation of a sediment detention basin may create habitat for non-native wildlife such as bullfrogs within established California red-legged frog habitat; however, such non-native species may not have the opportunity to colonize the created basin for many years, thus delaying the impact to the native species. The anticipated timing of potential impacts, either during construction or later operations, is presented in the impact heading.

The intent of the SMMP is to be as self-mitigating as possible for incurred wetland and riparian impacts. Thus, for areas where bank improvements or sediment removal are proposed, the use of

environmentally-based stream and bank stabilization techniques, on-site wetland enhancements, and riparian vegetation planting have been incorporated. With regard to instream wetlands and riparian habitat, such enhancements may produce long-term habitat benefits for many areas. The result may be tree-lined riparian corridors and riparian habitat where they presently do not exist. At the same time, the SMMP would fundamentally alter, and in many cases permanently remove habitat elements which many aquatic species depend upon. As the primary example, breeding habitat for the California red-legged frog occurs at only a few isolated locations on the Livermore-Amador Valley floor, many of which are identified for stream management under the SMMP. The degree of care taken in designing, implementing, and maintaining the SMMP would dictate the local distribution and continued survival of this species on the valley floor. Thus, beyond wetland and riparian planning aspects, the presence of sensitive species would influence final SMMP project designs so that project benefits consider the full spectrum of wetland functions and values. Anticipated impacts to biological resources are considered below.

Construction Impacts

Impact 3.5.1. Wetlands and Riparian Vegetation: During construction activities, SMMP improvements could impact in-stream wetlands and riparian vegetation during sediment removal and vegetation management. Category 1 Projects: Less than Significant with Mitigation; Category 2 Projects: Significant and Unavoidable.

Impacts from the construction of SMMP projects include temporary disturbance to or permanent loss of wetlands or wetland functioning and incremental degradation of wetland or riparian (streamside) habitats. Wetland functions and values in the SMMP area vary from relatively small, poor quality unlined channels (e.g., Line F-4, Project R.9-2) to major streams and creeks with mature riparian vegetation. With the exception of several trail system improvements, virtually every SMMP project has an instream construction element that would impact either wetlands or riparian habitat. This discussion of wetland and riparian impacts does not provide a separate analysis of each SMMP project. Rather, projects have been divided into one of two categories based on the intensity of the impact, as follows:

Category 1: Minimal to Moderate Impacts to Wetlands or Riparian Habitat. This impact class describes projects that would have few, if any impacts upon the function and values of instream wetlands or riparian habitats. Category 1 impacts would be temporary and/or relatively minimal in size and would not affect stream functions and values such as groundwater recharge, groundwater discharge, flood flow alteration, sedimentation and bank stabilization, nutrient removal and transportation, wildlife diversity and abundance, or habitat for special-status species. Such projects include establishing trails (a possible riparian impact), removing instream drop structures to improve fish passage, stream enhancement, minor bank protection projects, and phased sediment removal or bank stabilization activities (e.g., Projects R.8-2 through R.8-4). Impacts in this category are designated as “N” (no impact), “LTS” (less-than-significant impact) or “LSM” (less-than-significant impact with mitigation) respectively in **Table 3.5-2** and are considered to be generally less-than-significant, or significant but fully mitigable. Such projects may temporarily compromise wetland functions and values; however, such values are generally not permanently lost and if reduced are mitigable.

Category 2: Extensive Impacts to Wetlands or Riparian Habitat. This class describes projects that would have severe, long-term adverse impacts upon stream functions and values. Such projects include major stream realignments (e.g., Project R.5-3), creation of straight, uniform low-flow channels that generally lack habitat elements and structural diversity required by native aquatic species (8,000 linear feet for Project R.9-6), and those with major concrete-lining of channels (e.g., Projects R.8-2, R.9-2, and R.9-3). Such projects have a long-term impact on the stream's ability to support basic wetland functions and values. Projects that cause the permanent fill or extensive alteration to major stream sections that result in permanent reduction to habitat functions and values, or compromised habitat values over the long-term would have a significant impact.

Implementation of **Mitigation Measures 3.5.1a and 3.5.1b**, including the creation and implementation of a comprehensive Wetland Mitigation Plan would reduce the potential impact of the Category 1 projects to less than significant at the MEIR level. The SMMP includes creation of approximately 28 acres of on-stream and off stream wetland, dedication of 22 acres for habitat conservation, and dedication of 146 acres of land for floodplain management. However, it is estimated that approximately 52 acres of wetland mitigation would be required for sediment removal projects, depending upon final project design and mitigation ratios established during permitting. For at least four Category 2 projects, the impact would remain significant and unavoidable. For Projects R.8-2, R.9-2 and R.9-3, a substantial area and length of instream wetlands would be permanently filled due to concrete-lining without direct compensation for wetland losses. Project R.5-3 involves a major realignment of Arroyo las Positas; however, relative to instream wetlands and riparian habitat, with mitigation there would be no net loss of wetland functions and values. **Table 3.5-2** at the end of this section summarizes the impact conclusion for wetlands and riparian habitat for the SMMP projects.

For several SMMP projects, although substantial wetland and riparian impacts would be incurred during construction, follow-up stream restoration and riparian planting activities in stream reaches that presently support only minimal riparian vegetation (e.g., Project R.8-3 in Arroyo Mocho and R.8-4 in Arroyo de la Laguna) could result in a net long-term gain in riparian habitat and wetland functions and values at these locations.

Mitigation Measures

Mitigation Measure 3.5.1a: Where feasible, Zone 7 shall avoid and minimize disturbance of in-stream wetlands and riparian vegetation in the SMMP project area as a focus of project design and construction.

The preferable form of mitigation recommended by the Corps and CDFG is avoidance of jurisdictional waters and riparian vegetation. All excavation activities associated with recontouring stream banks, instream sediment removal, removal of structures, or native vegetation management would be limited to the minimum area necessary to complete the work. Identification and protection of wetlands and drainages would be implemented consistent with the provisions of **Mitigation Measure 3.5.1b**.

Mitigation Measure 3.5.1b: Zone 7 shall compensate for the loss of jurisdictional waters through the development and implementation of a comprehensive Wetland Mitigation Plan. The Wetland Mitigation Plan shall include one or more of the following mitigation strategies, in descending order of importance.

1. *Restoration, rehabilitation, or enhancement of drainages and wetlands in areas on-site that remain unaffected by project activities or off-site at one or more suitable locations within the project region:*

Onsite restoration, rehabilitation, and enhancement: Streams and wetland habitat in the SMMP project area have suffered varying degrees of degradation due to past stream management, straightening and channelization, and the removal of riparian habitat. Onsite wetland habitat could be restored, rehabilitated, or enhanced as mitigation for losses to function with a focus on restoring or enhancing function of degraded stream reaches.

Offsite restoration, rehabilitation and enhancement can consist of either rebuilding or re-establishing former waters or rehabilitation of degraded waters. The former activity results in a net increase in acreage, while the latter does not. However, both aspects of restoration result in a net increase in wetland functions. While enhancement activities do not result in an increase in acreage, their objective is to provide a net gain in wetland or riparian function. Under this strategy, restoration, rehabilitation, or enhancement activities would optimally occur on lands that are protected and not subject to future flood control maintenance, such as the Springtown Natural Community Reserve or East Bay Regional Park lands. Such lands would contain streams and/or wetlands in need of restoration or enhancement and capable of having functions similar to or higher than those lost due to development as a result of SMMP projects.

2. *Creation of onsite or offsite drainages or wetlands at a minimum of a 1:1 functional equivalency or acreage ratio (as verified by the Corps):*

Onsite wetland creation: New drainages or wetlands, as appropriate, could be created onsite, in areas protected from development that would replace lost functions including drainage, flood water detention, and support of wetland dependent plants and animals.

Offsite wetland creation: Wetlands could also be created in suitable off-site locations, including a project-specific or otherwise designated mitigation bank. The following guidelines shall be adhered to whether created wetlands are located on- or off-site:

- i. Corps guidelines encourage the selection of a mitigation site with natural hydrology and soils suitable for supporting wetland or riparian vegetation; therefore, an analysis of local watersheds, runoff patterns that would contribute water to the wetlands, and local soils shall be conducted prior to wetland design.
- ii. Created wetlands or drainages shall be excavated topographic depressions designed to fill with and/or convey seasonal rainfall and local runoff.
- iii. Following excavation, wetlands or drainages shall be seeded or planted with appropriate native wetland plants of local genetic stock and then allowed to establish naturally.

- iv. Wetlands or drainages shall be created within larger upland areas left in a natural state as a buffer and a buffer zone of a minimum of 50 feet from wetland borders shall be preserved.
 - v. One purpose of these wetlands or drainages will be to provide natural habitat values. Therefore, landscaped ponds shall not be considered acceptable mitigation for loss of wetland habitat.
 - vi. Long-term vegetation maintenance shall be provided in the form of weeding, watering, and replanting as necessary.
 - vii. Created wetlands or drainages shall be monitored for a minimum of 5-years to ensure that wetland conditions are achieved (i.e., successful establishment of native wetland plants and hydrologic regime) in accordance with the conditions of State and/or Federal permit approvals.
 - viii. Mitigation and monitoring reports shall be prepared annually.
3. *Purchase of credits in an authorized mitigation bank acceptable to the Corps, CDFG and USFWS.* The purchase of mitigation bank credits and the addition of land or other contribution to an already existing mitigation bank may result in greater overall habitat and resource value than would smaller parcels of land set aside for mitigation at the margins of developed areas within the project area.
 4. *Contributions in support of restoration and enhancement programs located within the project region,* such as the Alameda Creek Fisheries Restoration Workgroup; or regionally based organizations, such as The Nature Conservancy; or supporting appropriate state and federal conservation efforts such as CDFG or USFWS conservation efforts in the region. For example, under certain circumstances the Corps has determined that greater resource protection and conservation benefits may be achieved by gathering funds in lieu of actual required mitigation actions and allocating such in-lieu fees to independent conservation projects that will offset wetland impacts resulting from the authorized activity (U.S. Army Corps of Engineers, 2000).

According to the recent guidance from the Corps (U.S. Army Corps of Engineers, 2002), compensatory mitigation should be based, if feasible, on functional equivalency. While the Corps has traditionally used acreage as the standard measure for determining impacts and required mitigation, the agency is now renewing its focus on wetland function and encouraging the use of functional assessment methods to measure impacts and mitigation. In any one case, the same approach must be used to determine losses and gains, in terms of amounts, types, and locations, for describing both impacts and compensatory mitigation. Therefore, for each project a functional assessment should be made by qualified professionals using techniques generally accepted by experts in the field and fully considering the ecological functions included in the 404 (b)(1) Guidelines. The objective of such an assessment is to provide, at a minimum, a one-to-one functional replacement for losses in wetland function, including an adequate margin of safety to reflect anticipated success. In cases where functional assessment is not practicable or feasible or where definitive information on the functions of a particular wetland or stream is lacking, a minimum one-to-one acreage may be used as a reasonable surrogate for no net loss of functions.

A focus on replacing wetland functions, rather than simply calculating the acreage affected by development, will in most cases provide a more accurate and effective way to achieve the environmental performance objectives of the Corps' no net loss policy and provide greater opportunity for development of a balanced mitigation package that may contain multiple components, including both on-site and off-site components as described below. For SMMP creek rerouting projects or stream widening projects, the banks or channel bottom will require extensive replanting and/or wetland creation. Restoration has been demonstrated to be more feasible and successful than creation of wetlands. Therefore, in any wetland mitigation plan, restoration should be emphasized first, then enhancement, and lastly creation or preservation, when no other options exist.

In the event that potential impacts to jurisdictional waters are anticipated, compensation for loss of jurisdictional waters would be based on a verified wetland delineation of the area in question. During the permit application process for specific project components with identified impacts on jurisdictional waters, Zone 7 shall consult with the Corps, CDFG, and the Regional Water Quality Control Board (RWQCB) regarding the most appropriate assessment and mitigation methods to adequately address losses to wetland function that may occur as a result of the proposed project. A Wetland Mitigation Plan would be developed during the permit process, prior to project implementation and would include one or more of the mitigation plan strategies identified in **Impact 3.5.1** discussion. The Plan would be submitted to permitting agencies for their approval. When technically feasible, mitigation work proposed in existing wetlands or drainages on- or off-site in the project region shall occur prior to commencement of construction activities at the project site, or immediately thereafter. Purchase of mitigation bank credits and contributions towards restoration or enhancement programs also shall be made prior to project implementation.

Impact Significance after Mitigation: Less than significant with mitigation for all Category 1 projects and potentially beneficial for several projects that result in long-term net wetland or riparian habitat enhancement. Significant and unavoidable for Category 2 Projects R.8-2, R.9-2 and R.9-3 due to permanent, unmitigable wetland losses. Additionally, the overall unmitigated loss of wetland habitat for the SMMP is estimated at roughly 24 acres. Therefore, impacts related to wetland loss are considered significant and unavoidable at the MEIR level.

Impact 3.5.2. Heritage And Other Significant Trees: Construction of proposed facilities could result in impacts to heritage or other significant trees in the SMMP area. Less than Significant with Mitigation.

Trees considered significant by project area municipalities or the County of Alameda may be damaged or removed during SMMP implementation. Such trees include heritage trees, street trees, and ancestral trees that occur within the project area. Such large trees provide important wildlife habitat and are used as nesting sites for raptors and songbirds, roosting sites for bats, and foraging areas for birds. Standing deadwood supports particularly high quality habitat for birds and wildlife because nesting and foraging opportunities increase with the deterioration of the aging tree. If removed from riparian corridors during maintenance projects, such trees take decades to replace through regrowth. A comprehensive tree survey of the SMMP area has not

been conducted, thus the full extent of tree removal is not known. Impacts to trees and riparian habitat that are subject to CDFG regulation are considered in Impact 3.5.1.

Implementation of **Mitigation Measures 3.5.2a and 3.5.2b** would reduce impacts to less-than-significant. **Table 3.5-2** at the end of this chapter, summarizes the impact conclusion for heritage and significant trees for SMMP impacts.

Mitigation Measures

Mitigation Measure 3.5.2a: For projects where the removal of heritage or other significant trees is eminent, Zone 7 shall conduct a tree survey of each project area and retain such trees in the project area to the extent possible.

Mitigation Measure 3.5.2b: As appropriate, permits shall be obtained from the county and local municipalities to remove trees. As required by local municipalities or the County, mitigation may include replacing disturbed or removed trees or compensating the County for the appraised value of the impacted trees, or replanting trees at the same location following construction. Maintenance of the replanted trees until established may be required to ensure survival.

Impact Significance after Mitigation: Less than significant.

Impact 3.5.3. Riparian Vegetation: Construction of the proposed hardscape bank protection at three locations (Chabot Canal, Line F-4, and Line J channels) would cause a loss of riparian vegetation functions and values. This could permanently impact the quality and availability of wildlife habitat following construction. Significant and Unavoidable.

Three SMMP projects propose hardscape bank protection over approximately 10,200 linear feet (l.f.) and are expected to cause an incremental loss or degradation of riparian functions and values (**Table 3.5-1**). Because such functions and values are intimately tied to habitat quality and suitability for fish and wildlife, projects that employ wide-ranging use of hardscape bank stabilization can significantly diminish or eliminate habitat suitability for many native wildlife species. For such projects, the loss of riparian functions and values is both permanent and significant.

While there has not been a direct analysis of the modification and decline of riparian communities in the Livermore-Amador Valley, studies suggest that significant stream alterations started in the early 1900's with the introduction of agriculture and stream channelization, and more recently due to urbanization (Hanson, et al., 2004). Although most of the streams in the Valley have been channelized, use of hardscape bank protection and concrete-lining has been infrequent. The three projects where concrete lining methods are proposed are located on relatively small flood control channels that lack woody riparian vegetation (**Table 3.5-1**). These streams have been already heavily impacted by channelization and management activities. Even so, with the exception of Line F-4, these streams provide important connectivity between the upstream watershed and downstream areas.

**TABLE 3.5-1
SMMP PROJECTS WITH CONCRETE-LINING OF CHANNEL**

Project Number	Project Element
R.8-2 – Chabot Canal Improvement	Concrete-lining 3,100 l.f. of Chabot canal upstream of I-580.
R.9-2 – Line F-4 Concrete Lining	Concrete lining 5,000 l.f. of channel.
R.9-3 – Line J-1, J-3, and J-5 Improvements	Concrete line 2,100 l.f. of channel.

SOURCE: RMC, 2005

Although degraded, these streams provide a wide range of biological functions that include providing foraging and nesting habitat for native birds, and use as migration corridors by terrestrial wildlife species. The streams are important in their ability to sustain native wildlife in urban areas where they would not otherwise persist. Species that would potentially be impacted by the proposed measures include fish (generally limited to mosquito fish in these stream reaches; B. Pittman, pers. obs.), songbirds such as barn swallow, cliff swallow, brewer's blackbird, red-winged blackbird, and black phoebe, amphibians such as western toad and pacific treefrog, and mammals such as raccoon and opossum.

Concrete lining would create a permanent change that would eliminate or severely reduce the potential for future vegetation growth at modified locations. In-stream riparian vegetation, typically cattails and emergent sedges in these streams, would be removed along with escape and breeding cover for aquatic organisms such as undercut banks and overhanging vegetation. Such removal would eliminate shade and vegetation that provide escape and breeding cover, and food sources for wildlife.

Under the SMMP, concrete lining accounts for roughly 7 percent of proposed bank improvements (10,200 l.f. of bank versus 61,500 l.f. of bio-technical stabilized bank and 76,300 l.f. of riparian vegetation planning and vegetation management). Because habitat functions and values would be permanently lost at these locations, with implementation of **Mitigation Measure 3.5.3a** the potential impact would remain significant and unavoidable. **Table 3.5-2** at the end of this chapter summarizes the impact conclusion for SMMP project impacts resulting in the loss of habitat functions and values.

Mitigation Measures

Mitigation Measure 3.5.3a: To the extent practicable, Zone 7 shall avoid and minimize use of hardscape elements in stream design, provide habitat elements such as detention basins within hardscaped areas to support native wildlife species, and/or research and implement stream stabilization opportunities that meet the fundamental goals of providing bank stabilization while maintaining fundamental stream functions.

It is anticipated that impacted stream functions and values will be permanently lost at Projects R.8-2, R.9-2 and R.9-3, and would be replaced through off-site compensation or mitigation at other sites within the SMMP area. The direct impacts of these hardscape bank protection projects would remain significant and unavoidable.

Additional mitigation for habitat losses would be provided as described in **Mitigation Measures 3.5.1a and 3.5.1b**.

Impact Significance after Mitigation: Significant and unavoidable for Projects R.8-2, R.9-2 and R.9-3. Even with implementation of Mitigation Measures 3.5-3a and 3.5-3b, the potential impact would remain significant and unavoidable due to the habitat loss. Therefore, this impact is considered significant and unavoidable at the MEIR level.

Impact 3.5.4. Breeding Raptors and Birds: Construction of proposed facilities could result in disturbance to breeding raptors and passerine birds protected under the migratory bird treaty act and other statutes. Less than Significant with Mitigation.

Raptors and passerine birds are expected to nest in and adjacent to the project corridors throughout the SMMP area. Nesting sites include trees, riparian corridors, streamside vegetation, shrubs, and open grasslands. Fish and Game Code Sections 3503 and 3503.5, and the Migratory Bird Treaty Act protect raptors and passerines and their eggs and nests from incidental “take.” Disturbance due to construction could result in reproductive failure for raptors and songbirds within the SMMP area. This could be a significant impact.

Implementation of **Mitigation Measure 3.5.4a** would reduce this potential impact to less-than-significant. **Table 3.5-2** summarizes the impact conclusion for SMMP projects that could potentially impact breeding birds.

Mitigation Measures

Mitigation Measure 3.5.4a: Zone 7 shall Identify and protect active songbird and raptor nests during construction with appropriate buffers and avoidance. Potential construction disturbance impacts will be reviewed at the project-level for specific facilities proposed under the SMMP and additional mitigation measures shall be implemented as appropriate. At a minimum, the following measure will be implemented to address potential impacts to nesting songbirds and raptors in the vicinity of the construction sites.

- To the extent feasible, construction activities in or near active stream channels shall avoid the songbird and raptor nesting season between March 15 and August 15. If construction must occur during this period, sites shall be surveyed by a qualified biologist to verify the presence or absence of nesting birds or raptors. If the survey indicates the potential presence of nesting birds or raptors, survey results would be coordinated with CDFG and suitable avoidance measures would be developed and implemented. Construction shall observe the generally recommended CDFG avoidance guidelines, which are maintaining a minimum of 500-foot buffer zone surrounding active raptor nests and a 250-foot buffer zone surrounding nests of other birds. Unless direction from CDFG specifies otherwise, buffer zones shall remain until young birds have fledged.

Impact Significance after Mitigation: Less than significant.

Impact 3.5.5. Special-status Species Or Critical Habitat: Construction of proposed facilities could result in direct immediate impacts to special-status plant and/or wildlife species, or designated or proposed critical habitat for listed species. Significant and Unavoidable.

For the purpose of this analysis, unless shown to be absent, special-status species are presumed present in all portions of the SMMP area that provide at least moderate quality habitat. Special-status species with the greatest potential to be directly impacted during SMMP construction are identified in **Tables A.3.5-1 and A.3.5-2 in Appendix 3.5**. Additionally, projects in Reach 5 traverse areas that are proposed by the USFWS as critical habitat for California red-legged frog (USFWS, 2004a; 2004b). Construction impacts associated with most proposed SMMP projects that result in impacts to aquatic or semi-aquatic species and their habitat as a result of temporary increases in sedimentation and turbidity and accidental release of hazardous materials are addressed in **Section 3.2, Hydrology and Water Quality** and **Section 3.10, Hazardous Materials**.

Potential construction-related impacts to special-status species include temporary or permanent modification of habitat, severance of connectivity between adjoining habitats (see the Impact 3.5.6 discussion), direct mortality by equipment, loss or degradation of designated critical habitat, entrapment or mortality during construction, general disturbance due to noise or vibration during earthmoving or other construction activities. Additional impacts on special-status species could occur as a result of increased human intrusion along new trails, increased erosion of newly denuded habitats, the introduction of invasive wildlife species (see the Impact 3.5.7 discussion), disruption of migratory corridors, sedimentation, filling and disturbance of aquatic habitats, and general reduction in biological diversity.

Because SMMP projects are being conducted in support of existing infill projects in areas that are generally developed, they generally do not support the planned conversion of undeveloped rural land in the region. As a result, they are not believed to have significant cumulative region-wide impacts on special-status species or general biological resources.

Impacts to proposed critical habitat for special-status species may consist of permanent or temporary modification or loss of areas that have high conservation value for listed amphibians. The overall cumulative effect of the projects under the SMMP upon designated or proposed critical habitat is considered less-than-significant. This is because very few of the projects occur within critical habitat (Reaches 1 and 5 only) and are in general only located on the fringes of designated habitat units.

With implementation of **Mitigation Measure 3.5.5a**, this potential impact would remain significant and unavoidable. This impact remains significant after mitigation because habitat impacts at several locations are expected to have permanent effects on species distribution capabilities within primary migration routes and habitat availability. For example, Projects R.1-3, R.2.2 and R.5-3 could eliminate or permanently modify several core habitat areas such that they no longer support California red-legged frogs. In recent years, habitat for this species was severely curtailed in Arroyo las Positas downstream from Las Positas Golf Course during a stream realignment project similar to Project R.5-3. Without adequate protection, implementation

of Project R.5-3 could eliminate a large proportion of remaining red-legged frog habitat in Arroyo las Positas downstream from I-580 and potentially eliminate a trans-highway species movement corridor. **Table 3.5-2** at the end of this chapter summarizes the impact conclusion for SMMP project impacts to special-status species and/or critical habitat.

Mitigation Measures

Mitigation Measure 3.5.5a: Zone 7 shall protect special-status plant and wildlife species by minimizing habitat impacts during project design, consulting with resource agencies, and implementing protective measures. At the time of project certification, Zone 7 shall agree to comply with mitigation measures to protect special-status plant and wildlife species. Zone 7 will be required to implement measures that avoid, minimize, and compensate for significant impacts to special-status species and their habitat. Typical measures that may be included in the review of SMMP projects include:

- In support of the CEQA, RWQCB, CDFG and USFWS permitting processes for individual SMMP projects, biological and wetland surveys shall be conducted as part of the environmental review process to determine the presence and extent of sensitive habitats and/or species in vicinity of each project. Surveys shall follow established methods and shall be undertaken at times when the subject species is/are most likely to be identified. In cases where impacts to state- or federal-listed plant or wildlife species are imminent, formal protocol-level surveys may be required on a species-by-species basis to determine the local distribution of these species. Consultation with the USFWS and/or CDFG shall be conducted at an informal level for the SMMP projects that could impact federal or State candidate, threatened, or endangered species, or designated critical habitat for these species to determine the need for further consultation or permitting actions.
- Project designs shall be reconfigured, whenever possible, to avoid impacts to sensitive wetland or biological resources and minimize disturbances to wetland and riparian corridors. Projects shall minimize ground disturbances and construction footprints near areas with special-status species to the extent practicable.
- To the extent practicable, project activities located within or upstream from active amphibian breeding habitat shall be completed during the period that best avoids disturbance to plant and wildlife species present (e.g., May 15 to October 15).
- Individual projects shall minimize the use of in-water construction methods in areas that support sensitive fish, amphibians, or aquatic reptiles, especially when they are known to be present.
- In the event that equipment needs to operate in any watercourse with flowing or standing water, a qualified biological resource monitor shall be present at all times to alert construction crews to the possible presence of California red-legged frog, western pond turtle, salmonids (provided that access is available), or other aquatic species at risk during construction operations.
- A qualified biologist shall locate sensitive resources and Zone 7's contractors shall fence off before construction activities begin and, where required, shall inspect areas to ensure that barrier fencing, stakes, and setback buffers are maintained during construction.

- For work sites located adjacent to special-status plant or wildlife populations, a biological resource education program shall be provided for construction crews and contractors (primarily crew and construction foremen) as required before construction activities begin.
- Biological monitoring shall be conducted particularly in areas near identified habitat for federal- and state-listed species. A “no take” approach shall be taken as feasible during construction near special-status plant and wildlife species habitats.

Impact Significance after Mitigation: Significant and unavoidable at the MEIR level. Implementation of the above mitigation measure may or may not eliminate or reduce the impacts of individual projects to a less-than-significant level. It is anticipated that the SMMP projects that would reroute streams and create low-flow channels that reduce pooling within streams, and the large amount of stream channel that will be affected will cause a substantial short-term reduction in the quality and availability of habitat for special-status wildlife species, particularly amphibians and aquatic reptiles. Therefore, this impact is considered significant and unavoidable at the MEIR level.

Long-term Operational Impacts

Impact 3.5.6. Habitat Fragmentation: Sediment removal and vegetation management activities could fragment wildlife habitat and corridors resulting in long-term impacts to common and special-status plant and wildlife species. Less than Significant with Mitigation.

Over the life of the SMMP, more than five miles of channel and ten miles of bank under Zone 7 jurisdiction will be modified for flood protection or erosion control. It is anticipated that there will be incremental loss of riparian habitat during implementation of the SMMP, with a resulting cumulative impact to wildlife. Modifications to streams and channels have the potential to block or fragment wildlife access, or permanently eliminate known wildlife corridors.

Wildlife and plants live and occupy habitat where environmental conditions are appropriate to the species' life history requirements. The area where an organism lives must be large enough to support individuals and close enough to others of the same species to support populations. When such populations are distributed along linear stream corridors and surrounded by developed lands, the stream corridor fulfills dual function as both primary habitat for the species and as the species' movement corridor. Stream maintenance projects that severely modify instream habitat typically alter the ability of these areas to support common and special-status plants and wildlife species, and also have the potential to temporarily or permanently reduce movements within the stream system. Activities that isolate habitat patches by severing their connectivity to adjacent habitats are known as habitat fragmentation.

When implemented over long reaches of streams, project elements that change the basic habitat structure and composition of these areas create barriers to wildlife movement. Such activities include vegetation management, creation of low-flow channels, removal of suitable habitat elements (e.g., in the case of California red-legged frogs, deeper pools), and sediment removal. Using Project R.8-3 as an example, proposed sediment removal would create a gap that

temporarily isolates one portion of the watershed from another portion. Given that the created channel would have little native wildlife habitat values for perhaps many years, there could be two effects: first, the biological connectivity between these areas would be temporarily severed, and second, the size of the remaining habitat patches in the stream would be reduced. In severe cases, the habitat in adjoining areas may be too small to support individuals or may be too small or isolated to support populations. However, the SMMP includes built-in mitigation measures that recognize the need to spatially and temporally phase their implementation. With phasing being incorporated into individual projects, the previously noted adverse effects would be reduced if not avoided.

To facilitate the analysis of habitat fragmentation impacts, the SMMP projects have been categorized into two categories based on the intensity of the fragmentation impact. A final determination of impacts will need to be conducted during the project level analysis based on the incorporation of sufficient measures in the project design to reduce or eliminate impacts. The following criteria should be used as a guideline in determining such impacts:

Category 1: Minimal Potential for Fragmentation Impacts. Such projects would not reduce wildlife movements within the stream system, isolate existing habitat fragments, or reduce the size of existing habitats. These relatively low- to moderate impact projects would include such activities as culvert or bridge replacement projects, minimally-impacting trail projects, and minor bank stabilization projects. Impacts in this category may have no habitat fragmentation impacts, or if so, impacts would be short-lived without substantial modifications to project design.

Category 2: High Potential for Fragmentation Impacts. This category describes projects that, without mitigation or incorporated design elements to address impacts, would have severe, long-term adverse impacts relative to habitat fragmentation. Such projects include major stream realignments, sediment removal or bank stabilization projects that are generally greater than several hundred feet in length, concrete-lining of channel bottoms and sides, and the creation of impassible barriers to wildlife movement (whether barriers are structural features or long sections of barren, unvegetated habitat). For projects with potentially high fragmentation impacts, the incorporation of design elements to specifically address fragmentation impacts would almost always reduce such impacts to a less-than-significant level.

Implementation of **Mitigation Measure 3.5.6a** would reduce the potential impact to less than significant. **Table 3.5-2** at the end of this chapter summarizes the impact conclusion for habitat fragmentation impacts by individual SMMP projects.

Mitigation Measures

Mitigation Measure 3.5.6a: Whenever feasible, Zone 7 shall incorporate design elements into individual Category 2 projects, as determined during the individual project screening phase, to emphasize the retention of basic wildlife habitat elements within active project areas and retain habitat continuity during construction. Examples of several effective methods to reduce the effects of habitat fragmentation include:

1. Incorporating wildlife habitat elements into project designs to encourage native wildlife species to immediately use completed and restored project areas. Such design elements may include the use of downed trees or willow wattles for bank stabilization and cover, avoiding small patches of high quality wildlife habitat during construction, and the incorporation of aquatic cover (i.e., deep-water pools).
2. Temporal phasing of large-scale grading, habitat removal, or low-flow channel creation projects so that lengthy or greatly impacting projects do not create impassible obstacles to wildlife movement. As an example, the creation of low-flow channels and bank stabilization for Project R.8-3 are components of the same project, but could possibly be carried out in separate years to retain basic minimal wildlife habitat elements within the stream corridor at all times. Similarly, stream modifications for Project R.8-4 could be conducted after the project area for Project R.8-3 has been restored to minimize cumulative effects of these projects.
3. Spatial phasing of projects to assist in retaining wildlife habitat benefits. Using Project R.8-3 again as an example, elements within a project can be phased in to minimize the presence of large gaps in vegetation or aquatic habitat. Such a design could incorporate channel improvements on alternating 1,000-foot sections of creek, or phase improvements so that a single bank is graded and restored before the second bank is graded. This would also reduce cumulative impacts among nearby projects.
4. Revegetating and restoring impacted stream reaches as quickly as possible following disturbance using native plant species and long-term habitat management programs to ensure the return of habitat functions and values.

To the extent that simple phasing can be applied both spatially and temporally to project design, the above mitigation measure would substantially reduce the potential of projects to fragment wildlife habitat and create barriers to wildlife movement. For stream reaches and associated upland areas that provide minimal plant and wildlife habitat values, habitat enhancement activities following project implementation may improve habitat contiguity for wildlife and provide a long-term improvement to wildlife movement corridors.

Impact Significance after Mitigation: Less than Significant. Effects may be beneficial for Projects R.1-6 and R.1-7 and R.3-2 following SMMP implementation, as habitat improvements are expected to enhance the existing habitat connectivity.

Impact 3.5.7. Invasive Species: Long-term facility operation activities may facilitate the introduction and establishment of invasive wildlife species, primarily bullfrogs, following project implementation. Less than Significant with Mitigation.

Following sediment removal within channels or the creation of sediment retention basins, aquatic conditions may be created that favor the range expansion of invasive non-native wildlife species in the SMMP area. Of concern is the inadvertent establishment of American bullfrog (*Rana catesbeiana*) in created sediment basins and to a lesser extent non-native fish species in stream reaches where they presently do not occur. Bullfrogs are known to displace and prey upon native wildlife species, and particularly the federally threatened California red-legged frog. Bullfrog habitat expansion has been identified as a key obstacle to the recovery of the California red-

legged frog (USFWS, 2002). Following SMMP implementation, if hydrologic changes result in water ponding for longer durations there may be inadvertent creation of aquatic habitat that supports bullfrogs and bullfrog breeding in portions of Arroyo Mocho, Arroyo las Positas and other streams. Design considerations can be built into projects throughout the SMMP area to address this issue. Active management (i.e., through non-native species management planning) is another means to reduce bullfrog distribution, however, this approach should only be implemented in limited areas with significant ecological benefits and values, such as providing habitat for California red-legged frog. The implementation of specific design elements that encourage native wildlife species and a non-native species management program would reduce this impact to a less-than-significant.

Implementation of **Mitigation Measures 3.5.7a and 3.5.7b** would reduce impacts to less than significant. **Table 3.5-2** at the end of this chapter summarizes the impact conclusion on invasive species for the SMMP projects.

Mitigation Measures

Mitigation Measure 3.5.7a: When appropriate, Zone 7 shall incorporate design elements into the SMMP projects that discourage the establishment of non-native wildlife species in sensitive areas. A primary element for bullfrog control based on guidance provided in the USFWS *Recovery Plan for the California Red-legged Frog* (USFWS, 2002) is the capacity to seasonally drain in-stream sediment detention basins to discourage bullfrog breeding. Other examples include waste management programs along created public trails, discouraging the public from feeding raccoons and feral pets, and animal removal if predator populations appear to be significantly detrimental to the native species breeding success and survival. Such design elements may curb bullfrog expansion into areas with populations of California red-legged frog include Arroyo Seco (Projects R.2-1 and R.2-3) and upper realigned Arroyo las Positas (Project R.2-2). Altamont Creek and Arroyo las Positas near the Springtown Natural Community Reserve (Projects R.1-1 through R.1-7) are other high priority natural areas where design elements should work to reduce habitat for non-native wildlife species.

Mitigation Measure 3.5.7b: For select projects that could substantially expand bullfrog populations near sensitive California red-legged frog populations, Zone 7 shall implement a non-native predator control program in coordination with state and federal agencies. Arroyo del Valle is specifically identified in the 2002 Recovery Plan (USFWS, 2002) as a site that requires control or elimination of non-native predators. For Projects R.2-1 through R.2-3 and Projects R.1-1 through R.1-7, if after Mitigation Measure 3.5.7a has been applied the project is still expected to create a substantial bullfrog population source, then a specific program shall be created in coordination with the USFWS and CDFG to address and reduce bullfrog populations. Such a program shall include periodic amphibian surveys and removal of bullfrogs, and may require state and/or federal approval prior to implementation.

Impact Significance after Mitigation: Less than significant.

Impact 3.5.8. Resource Protection or Habitat Conservation Plans. Implementation of the SMMP may impact adopted resource protection or habitat conservation plans. No Impact.

No adopted resource management plans have been developed or apply to lands that are currently considered in this MEIR, therefore no conflicts exist with such plans. If such plans were developed at a later time, Zone 7 projects that are within resource planning areas would be assessed on an individual basis to ensure consistency with adopted plans. As such, no impact is anticipated. No mitigation is required.

**TABLE 3.5-2
SUMMARY OF BIOLOGICAL RESOURCES IMPACTS BY PROJECT**

Reach/Project	Construction Impacts					Long-term Operational Impacts		
	Impact 3.5-1 Wetlands And Riparian Vegetation	Impact 3.5-2 Heritage And Other significant Trees	Impact 3.5-3 Riparian Vegetation	Impact 3.5-4 Breeding Raptors and Birds	Impact 3.5-5 Special-status Species Or Critical Habitat	Impact 3.5-6 Habitat Fragmentation	Impact 3.5-7 Invasive Wildlife Species	Impact 3.5-8 Resource Protection Or Habitat Conservation Plans
Reach 1								
R.1-1	LSM	N	LSM	LSM	LSM	LTS	LSM	N
R.1-2	LSM	N	LSM	LSM	LSM	N	N	N
R.1-3	LSM	N	LSM	LSM	SU	SU	LSM	N
R.1-4	LSM	N	LSM	LSM	SU	SU	N	N
R.1-5	LSM	N	LSM	LSM	LSM	LSM	N	N
R.1-6	LSM	N	LSM	LSM	LSM	LSM/B	LSM	N
R.1-7	LSM	N	LSM	LSM	LSM	LSM/B	N	N
Reach 2								
R.2-1	LSM	N	LSM	LSM	SU	SU	N	N
R.2-2	LSM	N	LSM	LSM	LSM	N	N	N
R.2-3	LSM	N	LSM	LSM	LSM	N	N	N
Reach 3								
R.3-1	LTS	N	LTS	LSM	LSM	N	N	N
R.3-2	LSM	N	LSM	LSM	LSM	LSM/B	LSM	N
R.3-3	LTS	LSM	LTS	LSM	LSM	N	N	N
R.3-4	LSM	LSM	LSM	LSM	LSM	N	N	N
R.3-5	LSM	N	N	LSM	LSM	N	N	N
Reach 4								
R.4-1	LSM	N	LSM	LSM	LSM	N	N	N
R.4-2	LTS	LSM	LTS	LSM	LSM	N	N	N
Reach 5								
R.5-1	N	N	N	LSM	LSM	LTS	N	N
R.5-2	LSM	N	LSM	LSM	SU	LSM	LSM	N
R.5-3	LSM	LSM	SU	LSM	SU	SU	N	N
Reach 6								
R.6-1	LSM	LSM	LSM	LSM	LSM	LSM	N	N
R.6-2	LSM	LSM	LSM	LSM	LSM	LSM	N	N
Reach 7								
R.7-1	LSM	LSM	LSM	LSM	LSM	N	N	N
R.7-2	N	N	N	LSM	LSM	N	N	N
R.7-3	LSM	LSM	LSM	LSM	LSM	N	N	N

TABLE 3.5-2 (continued)
SUMMARY OF BIOLOGICAL RESOURCES IMPACTS BY PROJECT

Reach/Project	Construction Impacts					Long-term Operational Impacts		
	Impact 3.5-1 Wetlands And Riparian Vegetation	Impact 3.5-2 Heritage And Other significant Trees	Impact 3.5-3 Riparian Vegetation	Impact 3.5-4 Breeding Raptors and Birds	Impact 3.5-5 Special-status Species Or Critical Habitat	Impact 3.5-6 Habitat Fragmentation	Impact 3.5-7 Invasive Wildlife Species	Impact 3.5-8 Resource Protection Or Habitat Conservation Plans
Reach 8								
R.8-1	LSM	N	LSM	LSM	LSM	LTS	LTS	N
R.8-2	SU	N	LSM	LSM	LSM	N	N	N
R.8-3	LSM/B	N	LSM	LSM	LSM	LSM	N	N
R.8-4	LSM/B	N	LSM	LSM	LSM	LTS	N	N
Reach 9								
R.9-1	LSM	N	LSM	LSM	LSM	LSM	N	N
R.9-2	SU	N	SU	LSM	N	LTS	N	N
R.9-3	SU	N	SU	LSM	N	LTS	N	N
R.9-4	LSM	LSM	LSM	LSM	LSM	N	N	N
R.9-5	LSM	N	LSM	LSM	LSM	N	N	N
R.9-6	LSM	LSM	LSM	LSM	LSM	N	N	N
R.9-7	LSM	N	LSM	LSM	LSM	LTS	N	N
Reach 10								
R.10-1	LSM	LSM	LSM	LSM	LSM	N	N	N
R.10-2	LSM	LSM	LSM	LSM	LSM	N	N	N
R.10-3	LSM	LSM	LSM	LSM	LSM	N	N	N
R.10-4	LSM	LSM	LSM	LSM	LSM	N	N	N
R.10-5	LSM	LSM	LSM	LSM	LSM	N	N	N
Reach 11								
R.11-1	LSM	LSM	LSM	LSM	LSM	N	N	N
R.11-2	LSM	N	LSM	LSM	LSM	N	N	N
Reach 12								
R.12-1	LSM	LSM	LSM	LSM	LSM	N	N	N
R.12-2	LSM	LSM	LSM	LSM	LSM	N	N	N

Key to Abbreviations:

SU = Significant and Unavoidable

PS = Potentially Significant

LTS = Less than Significant

S = Significant

B = Beneficial

LSM = Less than Significant with Mitigation

N = No Impact

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3.6 Fisheries Resources

3.6.1 Setting

Regional Setting

The SMMP project area is located within and adjacent to intermittent and perennial creeks, and flood control channels that traverse the alluvial Livermore-Amador Valley floor in the Alameda Creek watershed. The vegetation along channel banks and in upland areas is a mosaic of riparian woodlands, annual grasslands, upland and riparian scrubs, alkali sinks (in specific areas) and developed lands (see **Section 3.5, Biological Resources**).

The Alameda Creek watershed, like others on the central and southern California coast, is subject to periodic droughts. Alameda Creek is usually a perennial stream in the upper parts of the watershed, but in the Sunol Valley, a high rate of infiltration normally results in a dry creek during the summer months (Gunther et al., 2000). Many of the tributaries that supply flows to Alameda Creek are historically intermittent and can become isolated from the mainstem beginning in early to mid-summer. This is especially true of streams, both natural and channelized, draining the Livermore-Amador Valley. In addition to fluctuations in stream flows caused by varying levels of surface water runoff, flows in Alameda Creek tributaries also vary greatly with rising and falling water tables and water supply activities such as State Water Project releases (Gunther et al., 2000) and groundwater recharge releases from Del Valle Reservoir.

The SMMP project area is located within the eastern portion of the Alameda Creek watershed and extends primarily across the Arroyo de la Laguna (ADLL) sub-basin, including large portions of the Arroyo Mocho and Arroyo del Valle watersheds, with one potential project (R.11-1) located along the Niles Canyon portion of Alameda Creek. See **Section 3.5, Biological Resources**, for an overview of the land use history of the SMMP project area, as related to biological resources and drainages within the project area. Many of the SMMP projects would be within defined creeks or flood control channels.

Aquatic Habitats and Resources

The Alameda Creek watershed encompasses approximately 633 square miles and flows from its headwaters at Oak Ridge south to South San Francisco Bay. The Alameda Creek watershed has been historically divided into three distinct reaches. Thirteen native fish species have been collected in non-tidal portions of Alameda Creek during the past century (Gunther, et al., 2000). Many of the species observed in the creek are those that are typical of streams in the region including steelhead/rainbow trout (*Onchorhynchus mykiss*), California roach (*Hesperoleucus symmetricus*), Sacramento sucker (*Catostomus occidentalis*), Sacramento pikeminnow (*Ptychocheilus grandis*, previously known as Sacramento squawfish), Pacific lamprey (*Lampetra tridentata*), and prickly sculpin (*Cottus asper*).

In recent years, small numbers of adult Chinook salmon (*Oncorhynchus tshawytscha*) have been recovered in the Alameda Creek Flood Control Channel, as well as other San Francisco Bay

streams not previously known to support salmon runs. It is generally believed that management of hatchery production has resulted in salmon straying to streams that have not traditionally supported them (Gunther, et al., 2000). Furthermore, the National Marine Fisheries Service (NMFS) determined in 1999 that listing the Central Valley fall and late fall-run Evolutionarily Significant Unit (ESU) of Chinook salmon, which includes streams in Alameda County, was not warranted (NMFS, 1999).

In addition to native fishes, the Alameda Creek watershed now supports populations of introduced fish species including bluegill (*Lepomis machrochirus*) and largemouth bass (*Micropterus salmoides*). These introduced species have increased in abundance and distribution throughout the watershed in the past decades (Gunther et al., 2000).

Central California Coast Steelhead

Current Status

There are two Distinct Population Segments (DPS) of the salmonid species *Oncorhynchus mykiss*: one anadromous (i.e., spends part of its life cycle in the ocean) and one resident (i.e., completes its entire life cycle in fresh water). The former is referred to as steelhead while the latter is typically referred to as rainbow trout. In watersheds where the two forms co-occur, the offspring of resident fish may migrate to sea, and the offspring of anadromous fish may remain in streams as resident fish. In fact, genetic studies have indicated greater differences among geographically separated *O. mykiss* populations of the same life-history form than between anadromous and resident life-history forms in the same geographic area (NMFS, 2004).

In a 1996 status review of the species, NMFS determined that resident rainbow trout and steelhead in the same area generally share a common gene pool and concluded that both the resident and anadromous forms should be included in the corresponding Evolutionarily Significant Unit (ESU) listing under the Federal Endangered Species Act (FESA) in certain cases where both forms co-occur below human-made barriers (NMFS, 1997a). However, resident populations occurring upstream of long-standing *natural* barriers (e.g., large water falls), and those populations that have resulted from the introduction of non-native (e.g. hatchery) rainbow trout, were not considered part of the ESU in the initial listing of the species in 1997 (NMFS, 1997a). In the case of resident populations occurring upstream of impassable *human-caused* migration barriers (e.g., dams), NMFS determined that insufficient information was available at the time to merit their inclusion in steelhead ESUs and that these populations would need to be evaluated on a case-by-case basis.

On June 14, 2004, NMFS issued a proposed rule on listing determinations for 27 ESUs of west coast salmonids (NMFS, 2004) following an updated, comprehensive status review of steelhead and salmon species. The proposed ruling states that recent genetic tests of the resident *O. mykiss* population occurring in the Alameda Creek watershed upstream of “Rubber Dam 1” are genetically similar enough to the anadromous form of the central California coast (CCC) steelhead ESU to warrant their inclusion in the ESU (NMFS, 2004), and thus its status as a federal threatened species. However, recent information regarding the genetic make-up of the

resident *O. mykiss* population in the Arroyo Mocho subbasin suggests that this particular population may have originated from hatchery stock (Nielsen, 2003).

In its final listing determination of west coast steelhead, however, the NMFS decided to segregate *O. mykiss* into two DPSs, anadromous steelhead and resident trout, and listed only the anadromous steelhead as a threatened DPS (NMFS, 2006). Due to the presence of migration barriers located in the lower Alameda Creek watershed, threatened CCC steelhead currently do not have access to the SMMP project area.

Critical habitat for CCC steelhead was originally designated in February 2000 (NMFS, 2000a). However, in 2002, NMFS withdrew the critical habitat designation pending further economical impact analyses (NMFS, 2002). In 2005, NMFS issued revised final critical habitat designations for areas that are known or assumed to be occupied by anadromous steelhead (NMFS, 2005). At that time, NMFS deferred a decision on critical habitat in the Alameda Creek watershed until a final decision on the listing status of the species had been made. As discussed above, the final listing determination concluded that resident *O. mykiss* would not be federally listed. Accordingly, the final critical habitat designations are restricted to the species' anadromous range, and are coextensive with the steelhead-only DPS delineations described in the final listing determination (NMFS, 2006). As such, critical habitat is currently not designated in the Alameda Creek watershed.

While the SMMP project area does not currently support the threatened CCC steelhead DPS and critical habitat has not been designated in the Alameda Creek watershed, the wording of both the final listing determination (NMFS, 2006) and the final critical habitat designation (NMFS, 2005) suggests that the SMMP project area would be considered to support listed steelhead and designated critical habitat if and when migration barriers in the lower watershed are removed or remediated. As such, this MEIR considers the possibility of listed steelhead and critical habitat occurring in the SMMP project area in the future.

Central California Coast Steelhead Habitat Requirements

Steelhead typically migrate to marine waters in the spring after spending one or more years in freshwater. They typically reside in marine waters two to three years prior to returning to their natal stream in winter and spring to spawn as four or five year olds. Unlike salmon, steelhead are iteroparous, meaning they can spawn more than once before they die. Steelhead require cool (ideally less than 20°C), clean water in streams that contain adequately sized spawning gravels, instream cover, and riparian shading. The presence of migration barriers in the form of dams, grade control structures, culverts, or water diversion structures significantly limit steelhead access to historic habitat in the upper reaches of central California coast watersheds.

Recent reconnaissance level fisheries habitat assessments have been conducted in the SMMP project area (Gunther et al., 2000; Hanson et al., 2004). These studies have concluded that Alameda Creek (Niles Canyon), upper Arroyo Mocho (upstream of Mines Road), and upper Arroyo del Valle (immediately downstream of Del Valle Reservoir) are the only reaches within the SMMP project area that contain suitable year-round steelhead habitat. However, management actions would be required on Arroyo Mocho and Arroyo del Valle to realize the spawning and

rearing potential of these reaches (Hanson et al., 2004). Most other stream reaches within the SMMP project area are characterized by low and varying summer and fall stream flows, high water temperatures, and limited spawning gravels (Gunther et al., 2000). Habitat conditions within the entire Arroyo las Positas drainage were determined to be unsuitable for steelhead spawning and rearing (Hanson et al., 2004). Existing fisheries habitat conditions within the project area are further described below.

Central California Coast Steelhead Occurrence within the SMMP Project Area

The historical occurrence of steelhead in much of the Alameda Creek watershed is well documented (e.g., Gunther et al., 2000; Hanson et al., 2004). However, numerous migration barriers on Alameda Creek and its tributaries have made the vast majority of the watershed, including the SMMP project area, inaccessible to the species. Plans for removing and/or remediating a number of these barriers, such as the Sunol and Niles dams owned by the SFPUC, are currently being developed and steelhead may in the future be able to access spawning and rearing habitats in the upper watershed.

The historic occurrence of steelhead within parts of the SMMP project area is currently the subject of some debate. Analyzing available historical data on channel connectivity, flood frequency, and fish catches, Hanson et al. (2004) conclude that the “Arroyo Mocho channel form would have made adult steelhead migration unlikely prior to channelization based upon historical geomorphic conditions within the lower reaches of the Arroyo Mocho channel,” and “historically, steelhead passage in Arroyo del Valle occurred infrequently in response to high flow events that provided suitable surface water connectivity between Arroyo del Valle and lower Alameda Creek”. Furthermore, recent genetic analyses of resident trout in the Alameda Creek watershed concluded that Arroyo Mocho trout are more closely related to hatchery fish of the Mount Whitney strain than to the central California coast steelhead DPS (Nielsen, 2003). However, the analyses point out that a long-standing natural resident trout population may have derived from the same genetic source as the fish used to found the Mount Whitney strain (Nielsen, 2003).

Pacific Lamprey

The Pacific lamprey (*Lampetra tridentata*) is a Federal Species of Concern. However, on December 27, 2004, the U.S. Fish and Wildlife Service (USFWS) issued its finding that the formal listing of the species is currently not warranted (USFWS, 2004).

Pacific lampreys are known to occur in the Alameda Creek watershed. The species has been observed in the flood control channel of Alameda Creek (Gunther et al., 2000) and upstream of Niles Dam (SFPUC, 2002). However, recent surveys did not find lampreys upstream of the Sunol Dam (SFPUC, 2002).

The Pacific lamprey is anadromous. Like salmon, they are born in freshwater streams, migrate out to the ocean, and return to fresh water as mature adults to spawn. Lampreys enter streams between July to October and spawning takes place the following spring in low gradient sections of water, with gravel and sandy bottoms. Adults die after depositing about 10,000 to 100,000 extremely small eggs in their nest. Juvenile lamprey stay burrowed in the mud for four to six

years, moving only rarely to new areas. After a two-month metamorphosis, they emerge as adults. During high flow periods in late winter or early spring, the new adults migrate to the ocean, returning to spawn in freshwater after two to three years.

While in freshwater Pacific lampreys are often found to coexist with steelhead and salmon, indicating the similar habitat requirements of the two species. Thus, habitat destruction and alterations have also had similar effects on the species. Due to the dependence of juveniles on muddy bottoms, backwater areas, and low gradient areas, lampreys are susceptible to loss of wetlands, side channels, and back waters resulting from agricultural and forestry practices, as well as urban developments such as channelization for flood control.

Due to the migratory behavior of the species, lamprey distribution within watersheds is also affected by barriers. It is unclear why Pacific lampreys have been observed upstream of Niles Dam, but they have not been observed within the SMMP project area and are unlikely to occur there as long as downstream barriers continue to impede their migration.

SMMP Project Area Stream Channels and Associated Fisheries Habitat

This section describes the existing stream channels and associated fisheries habitat characteristics of the SMMP project area. Individual project reach designations, as defined by the boundaries described in **Chapter 2.0, Project Description**, are included within each drainage discussion (see **Section 3.5, Biological Resources**, for a description of both aquatic conditions, and the condition of adjacent areas within the project area). Information on natural habitats within the existing natural and channelized streams is based on file documents, recent biological surveys, and a reconnaissance survey of each SMMP project area drainage in fall 2004. Focused species or habitat field surveys were not conducted as part of this assessment. This discussion focuses primarily on steelhead habitat requirements due to (a) the listing status of the species, and (b) the fact that most native coldwater fish species typically thrive in conditions that meet steelhead habitat requirements.

Alameda Creek within Niles Canyon

Alameda Creek within Niles Canyon is a broad, deep stream with a varied combination of riffles, pools, and runs. The extent of riparian vegetation varies greatly in this reach. Aquatic habitat appear suitable for both steelhead spawning and rearing, although summer water temperatures are expected to be relatively high, with daily peak temperatures consistently exceeding 20°C, frequently exceeding 22°C, and occasionally reaching up to 28°C (Gunther et al., 2000). Although rare, rainbow trout and Pacific lamprey were encountered in this reach during surveys conducted in 1998 and 1999 (Trihey & Associates, 2001). Migration barriers currently present in this reach include the Sunol and Niles dams, as well as a U.S. Geological Service (USGS) gauging station. However, Alameda Creek in Niles Canyon has the potential to provide migratory, spawning, and rearing habitat for steelhead.

Sinbad Creek, a tributary to lower Alameda Creek in the town of Sunol, is regarded as potential steelhead habitat based on historic occurrences, but habitat values may be marginal since resident trout have not persisted in the creek (Gunther et al., 2000). Historic photographs suggest that coho

salmon (*Oncorhynchus kisutch*) also occurred in this tributary (Leidy et al., 2003). Alameda Creek between the Stonybrook Creek confluence upstream to the ADLL confluence is included in SMMP Reach 11.

ADLL

The majority of ADLL is probably unusable for steelhead except as a migration corridor (Gunther et al., 2000), although the lower reaches near its confluence with Alameda Creek may provide some seasonal habitat. Substrates throughout ADLL are dominated by fine sand and silt particles, pools are infrequent and presumably shallow, and water temperatures are expected to be high.

SMMP Reach 10 extends along ADLL from its confluence with Alameda Creek upstream to the confluence of Arroyo del Valle. This section of the creek has a somewhat natural meander and contains some riparian vegetation. A small portion of ADLL lies in SMMP Reach 8 and the upstream reaches of the drainage, including Alamo Creek and Canal, Dublin Creek, and South San Ramon Creek, make up SMMP Reach 9. Most of the channels upstream of Arroyo del Valle have been channelized and contain little or no riparian vegetation.

Arroyo del Valle

Arroyo del Valle drains approximately 160 square miles, the majority of which is located upstream of the Del Valle Reservoir. The accessible portion of Arroyo del Valle below the reservoir offers no significant steelhead spawning habitat, however Hanson et al. (2004) have identified the reach immediately below Del Valle reservoir as potential rearing habitat, although management in the form of downstream barrier removals and habitat enhancements would be required to realize the potential of this reach as steelhead habitat. Channelization, extensive sedimentation, loss of natural channel features, and high summer water temperatures characterize the stream (Gunther et al., 2000). Stream flows in Arroyo del Valle are controlled by releases from the reservoir. These releases are managed for groundwater recharge and also comply with Zone 7's water rights permit for a "live stream". Arroyo del Valle between the ADLL confluence and Stanley Boulevard contains moderate to full riparian shading. Little shading, elevated water temperatures, backwater conditions, and heavy sedimentation characterize the wide, impounded channel area through Shadow Cliffs Regional Park (Gunther et al., 2000).

The lower and mid portions of the stream comprise SMMP Reach 7 while the upper reaches of Arroyo del Valle and South Tributary are located within SMMP Reach 4.

Arroyo Mocho

Arroyo Mocho drains approximately 37 square miles. In its lower reaches between the confluence with ADLL and Stanley Boulevard, Arroyo Mocho is characterized by an incised, trapezoidal flood control channel, virtually no riparian vegetation, significant sedimentation, and locally heavy instream vegetation. Based on the predominantly silty substrate and overall lack of habitat complexity, this reach would only serve as migratory corridor for steelhead.

This section of Arroyo Mocho also flows through the area known as the Chain of Lakes (SMMP Reach 6). This seasonally dry portion of Arroyo Mocho has a cobble bottom and supports only

scant riparian vegetation and limited emergent vegetation. The stream banks are lined with a narrow strip of dense stands of bluegum eucalyptus (*Eucalyptus globulus*), which contribute to a general lack of understory species along this stream reach. Some willows (*Salix* sp.) are present along the channel in the vicinity of Cope Lake and Lake H.

Lower Arroyo Mocho has two northern tributaries; Chabot Canal and Tassajara Creek, which are included in SMMP Reach 8. Chabot Canal is a channelized flood control channel with no steelhead fisheries habitat. Tassajara Creek enters Arroyo Mocho and is a mostly natural channel draining areas south of Mount Diablo. The lowermost section of the creek is a flood control channel while the upper reaches consist of a fairly natural channel with a thin riparian buffer and a series of pools and riffles. No rainbow/steelhead were found in this creek during limited surveys in 1994 and informal surveys indicate that the watershed does not presently support a *O. mykiss* population (Leidy et al., 2003).

Through the City of Livermore, Arroyo Mocho is an urban stream with areas of rock gabion, riprap, and concrete slopes constraining the channel. Riparian cover is highly variable with some areas exhibiting almost complete coverage and others containing practically none. Some fairly natural segments in this area contain gravel and cobble stream substrates (Gunther et al., 2000). Although summer water temperatures in this reach are unsuitable for steelhead rearing (Hanson et al., 2004), the combination of gravel and cobble substrates, some channel complexity, and riparian cover suggest that this reach could provide potential steelhead spawning habitat in the future (if perennial flows existed); a goal of the SMMP. Between the City of Livermore and the South Bay Aqueduct (SBA) turnout, Arroyo Mocho becomes more natural with riffle-run habitats and gravel-cobble substrates (Gunther et al., 2000). Based on habitat characteristics, this reach could potentially serve as both spawning and rearing habitat, in addition to being a migratory corridor. However, stream flows in this area are greatly influenced by erratic releases from the existing SBA turnout depending upon the requirements of the Zone 7 artificial recharge program. The portion of Arroyo Mocho between the Chain of Lakes and the SBA turnout falls within SMMP Reach 3.

Upstream of Mines Road, Arroyo Mocho typically contains low summer flows but suitable water temperatures. Rainbow trout have been captured in this reach and potential spawning and rearing habitat for steelhead is present (Gunther et al., 2000). Primary habitat areas identified as suitable for steelhead rearing by Hanson et al. (2004) within upper Arroyo Mocho are all located upstream of the SMMP project area. Along with upper Alameda Creek and Niles Canyon, upper Arroyo Mocho has been classified as providing the greatest potential for restoring a viable steelhead population within the entire Alameda Creek watershed (Gunther et al., 2000).

Arroyo las Positas

Arroyo las Positas is a tributary to Arroyo Mocho and drains approximately 80 square miles of the northeast portion of the Alameda Creek watershed. The Arroyo las Positas sub-basin contains a number of tributaries, including Arroyo Seco, Altamont Creek, Acetone Creek, Collier Creek, and Cottonwood Creek. Arroyo las Positas flows primarily east to west through the City of

Livermore, including the Las Positas Golf Course. SMMP Reaches 1, 2, and 5 are within the Arroyo las Positas drainage.

The watershed is characterized by heavily incised channels through mainly commercial, agricultural, and ranch lands. All channels stream reaches in this watershed are either flood control channels or traverse heavily grazed grasslands. The predominant substrate size is fine silts and riparian vegetation is essentially non-existent. Base flows in these channels are generally low and dependant upon releases from the Lawrence Livermore National Laboratory (Gunther et al., 2000).

Habitat conditions within the Arroyo las Positas watershed are unsuitable for steelhead spawning and rearing (Gunther et al., 2000; Hanson et al., 2004). Although migration through the channels would be possible, there is no spawning habitat available in the upper watershed. Presence of steelhead in Arroyo las Positas in the future is unlikely, however, given the lack of suitable habitat, adult steelhead migrating up Arroyo Mocho may at times stray into lower Arroyo las Positas.

3.6.2 Regulatory Framework

A discussion of local, state and federal regulations that pertain to fisheries and other biological resources in the SMMP project area are presented in **Appendix 3.6**.

3.6.3 Fisheries Impacts and Mitigation Measures

Significance Criteria

Based on policy and guidance provided by CEQA (Public Resources Code Section 21001 and CEQA Guidelines), an impact of the proposed project would be considered significant if it causes one or more of the following effects:

- Adverse substantial effect to any species identified as a threatened, endangered, candidate, sensitive, or special-status species in local or regional plans, policies, regulations or by lists of species of concern from the CDFG, the USFWS¹ or as defined by Section 15380 of the CEQA Guidelines;
- Adverse substantial effect to habitat (including habitats for rare and endangered species as defined by Fish and Game Code 903) or other sensitive natural community identified in local or regional plans, policies, regulations or by lists compiled by CDFG or USFWS;
- Adverse substantial effect to federally protected wetlands (including but not limited to marshes and riparian areas) as defined by Section 404 of the Clean Water Act, or riparian and marsh areas under the jurisdiction of CDFG as defined by Fish and Game Codes 1601–1603;
- Substantial interference with movement of any native resident or migratory fish or wildlife species or with established migration or dispersal corridors;

¹ NMFS has jurisdiction over anadromous salmonids.

- Damage to a resource that is subject to Corps permit requirements under Section 404 of the federal Clean Water Act and that may provide valuable wildlife habitat, such as habitat for special status plant or animal species; or
- Conflicts with any applicable habitat conservation plan.

Impacts and Mitigation Measures

As discussed above, neither CCC steelhead nor Pacific lampreys are currently known to occur in the SMMP project area. Critical Habitat for steelhead is also currently not designated in the area. However, ongoing efforts to remove or remediate existing migration barriers in the Alameda Creek watershed, may significantly alter the existing status and distribution of fisheries resources in the project area in the future. As such, both special-status fish species, as well as Critical Habitat for CCC steelhead, may become present in the project area by the time individual SMMP projects are implemented. Therefore, it will be important to determine the current status and distribution of these species, as well as the status of their habitat, during the design and permitting phases of most SMMP projects. **Table 3.6-1** provides a summary of the types of fisheries impacts that may occur during the implementation of each of the SMMP projects.

Construction Impacts

Impact 3.6.1. Special-status Fish Species: Construction and maintenance activities associated with most proposed SMMP projects could result in impacts to special-status fish species and their habitat. Less than Significant with Mitigation.

Implementation of most SMMP projects would include construction activities within stream channels and/or upland areas in close proximity to channels. Instream construction activities would be required for projects that involve sediment removal, sediment basin construction, channel widening, low-flow and meandering channel creation, bank stabilization, fish barrier removal and/or modification, bridge work, culvert work, grade control construction, and possibly habitat pond construction. Projects requiring construction activities in upland or floodplain areas include trail construction, the construction of education/classroom structures and kiosks, bridge work, and wetland creation.

Furthermore, maintenance activities requiring instream and upland activities include sediment removals from sediment basins, bank stabilization, vegetation removal, trail repairs, wetland and season pond maintenance, and maintenance of flood control structures.

Most of these construction and maintenance activities would require some degree of ground clearing, excavation, backfilling, earthmoving, stockpiling and/or compaction, grading, and concrete work. These activities may result in the following significant impacts to special-status fish species:

Short-term increases in sedimentation and turbidity. Increased sedimentation rates could result if fine sediment is discharged to streams or mobilized within channels during project activities. Increased sedimentation may adversely affect water quality and channel substrate

composition. Specific rates of sedimentation are dependant upon the duration, volume, and frequency at which sediments are contributed to the surface water flow. Substantial sedimentation rates may smother fish eggs and fish food (i.e., benthic invertebrates), degrade spawning habitat, and fill pools. Furthermore, suspended sediments increase the turbidity of the water. High rates of turbidity can result in direct mortality or deleterious sublethal effects (e.g., gill abrasion, decreased visibility during foraging) to fish. Due to the mobility of suspended sediments and turbidity, these impacts could extend beyond the SMMP project area to downstream reaches of Alameda Creek. Thus, these impacts would be considered significant even if special-status fish species and critical habitat are not present within a specific project area at the time of project implementation.

Accidental spills and use of hazardous materials. Equipment refueling, fluid leakage, and maintenance activities within or near stream channels pose a risk of accidental water contamination that may result in injury or death to special-status fish species. Many commonly used hydraulic fluids contain organophosphate ester additives that are toxic to salmonids and other fish species. Acute lethal and sublethal effects have been documented in salmonids in particular (as opposed to warm water species). Leaks or spills of petroleum hydrocarbon products found in construction equipment have similar effects on fish. Vegetation removal may involve the use of herbicides that could potentially harm special-status fisheries species.

Furthermore, when surface water comes into contact with uncured concrete, either through accidental spills of concrete or through contact with recently-poured structures (i.e., bridge abutments, grade control structures, culverts), alkaline substances in the concrete may leach into the water, resulting in potential increases in the natural hydrogen ion concentration (pH). Rapid changes in the pH of the stream water can have adverse effects on fish, particularly if the pH concentration is raised above 9.

Direct injury or mortality resulting from equipment use and dewatering activities. During instream construction activities, special-status fish species may be crushed by earth moving equipment, construction debris, and worker foot traffic. It is therefore necessary to isolate the work area from actively flowing water through the use of coffer dams and dewatering pumps. However, dewatering activities can lead to fish becoming concentrated or stranded in residual wetted areas. Thus, if special-status fish species are known to or assumed to occur in the project area, capture and relocation procedures need to be implemented prior to construction. Capture and relocation efforts, in turn, may also result in injury or mortality to fish if not conducted by a qualified biologist according to established guidelines. Capture and relocation of CCC steelhead requires an incidental “take” authorization from NMFS.

Temporary loss, alteration, or reduction of habitat. In-channel construction activities, the use of construction equipment in stream channels, workspace dewatering, and clearing of riparian vegetation for work site access may result in temporary impacts to the habitat of special-status fisheries species. Potential adverse impacts that may occur include alterations of the stream substrate composition and channel integrity. Riparian vegetation is an important component of steelhead habitat, providing channel shading, bank stability and complexity, instream cover in the form of large woody debris, and an important source of organic matter and food. The temporary

loss of riparian vegetation may result in increased soil erosion, elevated water temperatures, and loss of fisheries habitat complexity.

Mitigation Measures

Mitigation Measure 3.6.1a: Implementation of **Mitigation Measures 3.2.1a and 3.2.1b** (see **Section 3.2, Hydrology and Water Quality**, implementation of a SWPPP and erosion control measures), as well as Best Management Practices (BMPs) for construction activities, would reduce potential impacts to special-status fisheries species and habitat resulting from sedimentation, turbidity, and hazardous materials. Due to the potential downstream extent of sediment, turbidity, and hazardous materials-related impacts, this mitigation measure will be implemented regardless of the status and distribution of special-status fisheries resources within the SMMP project area at the time of individual project construction. Specific measures aimed at protecting fisheries resources include:

- All instream construction activities will be conducted during the low-flow period of April 15 through October 15. If feasible, all instream work will be conducted during times when channels are dry.
- If construction in dry channels is not possible, water from around the section of the work site that is within the actively flowing channels will be diverted. This will reduce the potential for sediment or other pollutants to enter the waterways and to impact downstream resources. The diversions will consist of cofferdams installed in a manner that would not block more than two-thirds of the total stream width at any given time to allow for continued fish passage during construction.
- Sediment curtains will be placed downstream of the construction or maintenance zone to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone.
- Silt fencing will be installed in all areas where construction occurs within 100 feet of known or potential steelhead habitat.
- Spoil sites (concrete wash areas) will be located so they do not drain directly into the waterways. If a spoil site drains into a water body, catch basins will be constructed to intercept sediment before it reaches the channels. Spoil sites will be graded to reduce the potential for erosion.
- A spill prevention plan for potentially hazardous materials will be prepared and implemented. The plan will include the proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting of any spills. If necessary, containment berms will be constructed to prevent spilled materials from reaching the creek channels.
- Equipment and materials will be stored as far from waterways as feasible. No debris such as trash and spoils will be deposited within wetlands. Staging and storage areas for equipment, materials, fuels, lubricants and solvents will be located outside of the stream channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream will be positioned over drip pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream will be checked and maintained daily, to prevent leaks of materials that

if introduced to water could be deleterious to aquatic life. Vehicles will be moved away from the stream prior to refueling and lubrication.

- Proper and timely maintenance for vehicles and equipment will be provided to reduce the potential for mechanical breakdowns leading to a spill of materials into or around the creeks. Maintenance and fueling will be conducted in an area that meets the criteria set forth in the spill prevention plan (i.e., away from the creeks).
- Herbicides used for instream vegetation management will be limited to formulations approved for aquatic use and will be applied by certified workers in accordance with the manufacturer's specifications.
- Fresh concrete will be isolated from wetted channels for a period of 30 days after it is poured. If a 30-day curing period is not feasible, a concrete sealant approved for use in fisheries habitat may be applied to the surfaces of the concrete structure. If a sealant is used, the manufacturer's guidelines for drying times will be followed before reestablishing surface flows within the work area.
- To the extent feasible (i.e., in cases where a change in channel configuration is *not* the goal or objective of the project), project sites will be restored to pre-construction channel conditions, including streambed composition, compaction, gradient, and low flow channels. Large woody debris will be retained or restored where possible. Channel banks will be returned to original grade slope and appropriate bank stabilization techniques will be implemented to reduce the potential for erosion and sedimentation. A plan and/or specification describing pre-project conditions and restoration methods will be prepared prior to construction.
- Project sites shall be revegetated with an appropriate assemblage of native upland vegetation, and if necessary, riparian and wetland vegetation, suitable for the area. A plan and/or specification describing pre-project conditions, restoration and monitoring success criteria will be prepared prior to construction.

Mitigation Measure 3.6.1b: This mitigation measure will be implemented for projects involving instream construction activities in areas known to support CCC steelhead and/or Pacific lampreys at the time of project planning and design. If special-status fish species are known or suspected of occurring within the SMMP project area prior to the onset of construction or maintenance activities for individual projects, the following additional measures will be implemented to reduce the likelihood of direct injury or mortality to CCC steelhead and Pacific lamprey:

- All instream activities will be restricted to low-flow periods of June 15 through October 15. If the channel is dry, work can occur as early as June 1. Restricting activities to this work window will minimize impacts to migrating adult and smolt steelhead.
- Prior to construction of a diversion (coffer dams) and placement of sediment curtains (see **Mitigation Measure 3.6.1a**), a qualified biologist will conduct fish relocation activities, and immediately release captured fish to a suitable habitat near the project site. Capture and relocation measures will be conducted in accordance with the *Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act* (NMFS, June 2000b).

- If groundwater is encountered, or if water remains within the work site after flows are diverted, it will be pumped out of the construction area and into a retention basin constructed of hay bales lined with filter fabric. The pump(s) will be screened according to NMFS fish screening criteria for anadromous salmonids (NMFS, 1997b) in case individual fish eluded prior capture and relocation efforts.
- A qualified biological monitor will be on site during all instream construction and maintenance activities. The biological monitor will be authorized to halt the activities if impacts to special-status fisheries species are evident.

Impact Significance after Mitigation: Less than significant.

Impact 3.6.2. Steelhead Migration And Non-native Predator Species: The construction of instream structures such as sediment basins, culverts, bridges, and on-channel wetlands may result in barriers to steelhead migration and increases in the abundance and distribution of non-native predator species. Less than Significant with Mitigation.

Although the removal or remediation of existing fish migration barriers within the project area forms a part of some of the proposed SMMP projects, several of the SMMP projects propose to place structures within channels that contain potential critical steelhead habitat (primarily migratory habitat with limited rearing and/or spawning suitability). Unless designed to incorporate adequate fish passage accommodations, these structures may inadvertently result in new migration barriers. Streams known to contain at least some degree of suitable steelhead habitat within the SMMP project area are ADLL, Arroyo del Valle, and Arroyo Mocho. Therefore, only projects proposing to install instream structures in these drainages are assumed to have the potential to adversely affect steelhead.

Construction of the proposed sediment detention basin (Project R.3-4) and an on-channel wetland (Project R.3-2) on Arroyo Mocho may result in barriers to fish migration. Both structures would contain some type of weir to maintain sufficient water depth and reduce water velocities. Such weirs can impede fish passage, particularly during low-flow conditions. Furthermore, the reduced water velocities, elevated water temperatures, and often perennial hydrology of such impoundments may attract non-native predator species such as bull frogs. Juvenile steelhead migrating downstream through the sediment basin and created wetland may become susceptible to increased predation by non-native aquatic species.

The proposed removal of two existing low-flow crossings on Arroyo Mocho and subsequent replacement with elevated ford design and/or clear span bridge design crossings could also result in potential fish barriers unless designed to allow for year-round stream flow and fish passage.

Projects R.4-2, R.7-1, R.7-3, and R.10-1 propose to construct bridges across channels that provide potential steelhead migratory habitat. Bridges constructed with a natural stream bottom do not present fish passage impediments. However, bridges constructed with various types of concrete aprons covering the natural stream bottom may impede fish passage, particularly during low flow conditions.

Grade control structures proposed under several SMMP projects will be designed to be “fish-friendly” so as to not impede fish passage. The replacement of existing grade control structures with ones specifically designed to improve fish passage are discussed further under Impact 3.6.5 below.

Mitigation Measures

Mitigation Measure 3.6.2a: All proposed instream structures within ADLL, Arroyo del Valle, and Arroyo Mocho will be designed and constructed in manner that will not impede fish passage. Weirs, culverts, bridges, and grade control structures will be designed according to guidelines presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al., 1998), including the recently added section entitled *Fish Passage Evaluation at Stream Crossings* (CDFG, 2003). Implementation of this mitigation measure would reduce potential impacts to steelhead passage to less than significant.

Mitigation Measure 3.6.2b: Implementation of **Mitigation Measures 3.5.5a and 3.5.5b** (see **Section 3.5, Biological Resources**) at projects R.3-2 and R.3-4 would reduce potential non-native predator impacts to special-status fisheries species to less than significant.

Impact Significance after Mitigation: Less than significant.

Long-term Operational Impacts

Impact 3.6.3. Special-status Fish Species: Operation of the Arroyo Mocho Bypass and Regional Storage at Chain of Lakes project (R.6-2) and the Arroyo las Positas Diversion project (R.5-3) could result in direct impacts to special-status fish species. Less than Significant with Mitigation.

The proposed Arroyo Mocho Bypass and Regional Storage at Chain of Lakes project (R.6-2) and the proposed Arroyo las Positas Diversion project (R.5-3) include water diversion components aimed at regional flood control through detention storage. Project R.6-2 would divert flood flows from Arroyo Mocho into a new conveyance channel that would either direct flows around the Chain of Lakes into the widened section of Arroyo Mocho at El Charro Road, or direct flows into Cope Lake or Lake G for detention. A similar diversion and bypass channel would be constructed under Project R.5-3 to direct flood flows from Arroyo las Positas to Cope Lake or Lake G for detention.

Arroyo Mocho within the project area may provide migratory habitat for steelhead in the future. Although Arroyo las Positas does not provide suitable steelhead habitat, migrating adults may at times stray into its lower reaches. Thus, the proposed diversions from both streams into the Chain of Lakes could potentially result in the entrainment of CCC steelhead into the lakes. Furthermore, migrating steelhead may become attracted to the outlet of the drainback channel, located in the widened portion of Arroyo Mocho downstream of the Chain of Lakes, during periods when retained or bypassed flows are reconveyed into Arroyo Mocho. Steelhead may enter the drainback channel via the outlet and thus become trapped in the Chain of Lakes.

Steelhead entering the bypass channel, drainback channel, and the lakes could potentially become trapped. While fish in the bypass and drainback channels may have opportunities to exit the Chain of Lakes system voluntarily, individuals that enter the lakes would likely not be able to exit because approximately 75 percent of the water detained in the lakes would have to be actively pumped back into the drainback channel after the threat of flooding has subsided. The trapping of steelhead is considered a “take” of a listed species under FESA.

Project R.6-2 includes design features aimed at reducing the likelihood of steelhead entering the bypass channel and the Chain of Lakes. The diversion on Arroyo Mocho will consist of a 300 to 400-foot long overflow weir. The weir has been designed to minimize the hydraulic head across the structure in an attempt to reduce the potential for steelhead to overtop it. However, even with this design feature, the maximum estimated water depth across the top of the weir could amount to up to 1.7 feet for a 400-foot weir and 2 feet for a 300-foot weir (RMC, 2004). Considering that adult steelhead require a minimum water depth of only 0.6 feet for unimpeded migration (Bjornn and Reiser, 1991), the estimated water depths across the weir are not expected to prevent adult steelhead from entering the bypass channel and lakes.

However, most fish species, including salmonids, typically remain closer to the bottom of the water column than the top, particularly when in high water velocity conditions such as those that occur during storm flows. The exact channel depth below the top of the weir is not known at this time, but it is assumed that the water depth *over* the weir will be significantly less than the depth of the channel *below* the overspill. Therefore, fish present in the vicinity of the weir during diversion events will be far more likely to occupy portions of the water column below the top of the weir, thus reducing the likelihood of entrainment. Furthermore, salmonids are known to migrate during the falling leg of the hydrograph (i.e., when peak flows have subsided). Therefore, steelhead may not be migrating past the weir during times when diversions are occurring. On the other hand, steelhead that are in the vicinity of the diversion during storm flow events may seek refuge from high velocity flows in Arroyo Mocho by entering the bypass channel.

Project R.5-3 currently does not include design features aimed at minimizing the likelihood of steelhead entrainment.

Juvenile steelhead are expected to be more susceptible to entrainment than adults via the two diversions into the Chain of Lakes. This is due to the fact that the natural instinct of smolts (outmigrating juveniles) is to swim *with* the current whereas upmigrating adults naturally swim *against* the current. Therefore, it would be easier for smolts to misinterpret flows into the Chain of Lakes as providing the “correct” path to the ocean. Conversely, adults would be expected to be more likely than juveniles to enter the Chain of Lakes via the drainback outlet since this will present the against-the-flow swimming direction adults are seeking during upmigration.

The magnitude of the potential entrainment impact on steelhead (i.e., how many individuals of the species are likely to be harmed during the proposed activities) cannot be quantified or estimated at this time. Such quantifications require some level of population estimates within the affected area or the sub-basin. Since steelhead are currently not present in the subject watersheds, such population estimates are not available. The resident rainbow population in upper Arroyo

Mocho has been sampled several times since 1944 and data on that population, if available, could be used as a rough estimate of the potential size of future steelhead populations in the project area. However, while a summary of the results of these surveys (Leidy et al., 2003) provides some average fish size and abundance data, no estimates of population size (i.e., number of individuals per area) appear to be available at this time.

While screening the diversions (see **Mitigation Measure 3.6.3a** below) would significantly reduce the likelihood of steelhead entrainment, the potential for residual “take” will remain (i.e., screens may fail, overtop, or otherwise malfunction) and thus formal consultation with NMFS would be necessary. If screening the diversions is not feasible, a formal consultation will also need to be conducted. During this consultation, Zone 7 would seek an incidental “take” authorization, which would permit a given amount of “take”. Conditions that may be required under an incidental take permit would likely include, but not be limited to, the following:

- The development and implementation of a monitoring plan to evaluate the effectiveness of the screens;
- The development of a rescue program designed to capture and relocate steelhead that have entered the Chain of Lakes; and
- Off-site mitigation.

Mitigation Measures

Mitigation Measure 3.6.3a: During the final design and project-level environmental review phase for projects R.5-3 and R.6-2, Zone 7 shall investigate potential methods for screening the diversion structures to exclude fish from the proposed artificial channels and the detention/recharge lakes. Potentially feasible screening alternatives include traditional straight-faced screens, if it is determined that the sweeping velocities past the screens are sufficiently high to prevent fish impingement and debris build-up, or rotating drum screens. If screening the diversions is deemed feasible, the length of the weir may also be reduced.

Alternatively, steelhead could be prevented from inadvertently entering the Chain of Lakes via the Arroyo las Positas diversion (R.5-3) through the construction of a positive fish barrier downstream of the diversion. This could be achieved through constructing a drop structure. The maximum known jumping height of average-sized adult steelhead is approximately 11 feet if the appropriate hydraulic conditions exist (Bjornn and Reiser, 1991). One of these essential conditions is presence of a plunge pool with a water depth of at least 125 percent of the vertical jumping distance (i.e., the distance from the water level in the pool to the crest of the structure). Thus, the vertical height of a drop structure that would be necessary to constitute a barrier depends largely on the water depth and hydraulic conditions below the structure. As discussed above, Arroyo las Positas does not offer suitable steelhead habitat and blocking steelhead access to this drainage would not be considered an adverse impact to the species. Furthermore, the outlet of the drainback channel shall also be designed as a positive fish barrier to prevent steelhead from entering the Chain of Lakes. The design of the fish screens and drop structure shall be coordinated with technical staff at NMFS.

Impact Significance after Mitigation: Less than significant.

Impact 3.6.4. Hydrology-Related Impacts to Special-status Species: Operation of the Sycamore Grove Recharge Bypass project on the South Tributary of Arroyo del Valle (R.4-1) could result in water quality and hydrology-related impacts to special-status fish species. Less than Significant with Mitigation.

Under project R.4-1, existing summer-time water releases from Del Valle Reservoir into the main stem of Arroyo del Valle would be reduced and replaced by SBA water releases into South Tributary (tributary to Arroyo del Valle). This project would result in the restoration of a more natural hydrology (i.e., dry channel during summer and fall months) in Arroyo del Valle upstream of the South Tributary confluence and thus reduce ongoing adverse impacts to Sycamore Grove. The proposed discharge capacity, release volumes, frequencies, seasons, and operations at these two locations have not been determined; however, flow releases of up to 10 cubic feet per second are anticipated to be supported by the South Tributary without effects to current stream channel morphology. Please refer to **Section 3.2, Hydrology and Water Quality**, for a detailed discussion of Project R.4-1.

Suitable water temperatures for steelhead in California range from about 10°C to 20°C. Water temperature monitoring conducted on Arroyo del Valle during the summer of 2002 showed that summer temperatures in most reaches of this stream are unsuitable and potentially lethal for juvenile steelhead (Hanson et al., 2004). Only the reach immediately below Del Valle Reservoir contains suitable water temperatures (Hanson et al., 2004; Gunther et al., 2000) due to the fact that releases to the stream are made from the bottom elevations of the reservoir where water temperatures are typically low. The proposed reduction in the volume of water releases from the reservoir may result in an overall reduction of suitable steelhead habitat below the dam. Furthermore, the reduced release volumes would likely result in warmer water temperatures below the dam. Thus, the proposed project may reduce or eliminate the only viable steelhead rearing habitat in Arroyo del Valle.

The replacement of some recharge releases from Del Valle Reservoir with SBA releases to South tributary would likely have no adverse impacts on the aquatic habitat values of the reaches of Arroyo del Valle other than the area immediately below the dam. Even though the water temperatures of the SBA releases are typically higher than those of the reservoir releases, existing summer and fall water temperature in the recharge reaches of Arroyo del Valle are already unsuitable for steelhead rearing.

South Tributary upstream of Highway 84 currently contains relatively natural aquatic habitat. However, flows in the upstream portions are largely seasonal and an existing drop structure constitutes an approximately 15-foot tall migration barrier. The proposed SBA releases to the channel may create year-round flows and result in aquatic habitat improvements. If the drop structure was removed or otherwise made passable to fish, the proposed SBA releases to the channel may improve steelhead rearing habitat in this reach. Under conditions of low flows and high water temperatures (such as those of the proposed SBA releases), trout have increasing difficulty obtaining sufficient food to meet metabolic costs. However, researchers found that in Uvas Creek (Santa Clara County), a relatively warm stream with summer maximum water temperature of 23 to 25°C, steelhead move into higher velocity microhabitats in riffles and runs

where sufficient food can be obtained to sustain the higher metabolic rates induced by elevated water temperatures (Gunther et al., 2000). Thus, under augmented flow conditions, trout can occupy warmer habitats than may otherwise be possible (Gunther et al., 2000) and the proposed SBA releases may create limited rearing habitat in South Tributary.

The potential reduction or elimination of suitable steelhead rearing habitat in Arroyo del Valle downstream of the reservoir through the reduction of reservoir releases, and subsequent increases in water temperatures, under Project R.4-1 would be considered a significant impact. The potential for SBA releases to increase stream flows and therefore result in potential steelhead rearing conditions in South Tributary, even if water temperatures are slightly in excess of the typical steelhead tolerance range, would be considered beneficial impacts to special-status fisheries resources. The evaluation of whether the potential beneficial impacts of this recharge project would outweigh their potential adverse impacts, or vice versa, is largely dependent upon the hydrologic, geomorphologic, and riparian responses of the reaches to the proposed releases. Future release volumes and frequencies have not been established, so habitat responses cannot be estimated at this time.

Mitigation Measures

Mitigation Measure 3.6.4a: Given the uncertainties about the overall effects of the proposed releases on fisheries resources, Zone 7 shall develop and implement aquatic habitat assessment studies of Arroyo del Valle immediately below the reservoir and of South Tributary. The assessment will quantify steelhead habitat potentially lost in Arroyo del Valle due to proposed reductions in releases, and habitat potentially gained in South Tributary due to SBA releases. The assessment will include an evaluation of the feasibility of removing or remediating the existing migration barrier on South Tributary upstream of Highway 84 and make recommendations on potential habitat improvement measures.

- If the assessment concludes that the proposed project will result in no net loss (or a net gain) in potential steelhead habitat, recommendations made in the habitat assessment report (including barrier removal if feasible) will be implemented.
- If the assessment concludes that the proposed project will result in a net loss of potential steelhead habitat, Zone 7 will negotiate suitable habitat replacement options with NMFS and CDFG.

Impact Significance after Mitigation: Less than significant.

Impact 3.6.5. Fish Resources: Implementation of habitat protection and enhancement projects, including fish barrier removal projects, would have beneficial impacts on the fisheries resources of the SMMP project area. Beneficial.

A number of proposed SMMP projects include project components that are specifically aimed at improving steelhead passage in ADLL (R.10-3 and R.10-5), Arroyo del Valle (R.7-3), and Arroyo Mocho (R.3-4, R.3-5, R.6-1, and R.8-3). In some instances, existing barriers will be removed entirely; in other cases, barriers such as drop structures will be replaced with passable

grade control structures such as boulder vortex weirs. As discussed above, barriers to fish migration located in Alameda Creek downstream of the project area have received a considerable amount of attention over the past decade and their future removal or remediation is likely. Meanwhile, suitable steelhead habitat exists in upper Arroyo Mocho and, to a lesser extent, in Arroyo del Valle below the reservoir. Therefore, the SMMP project area has the potential to serve primarily as a steelhead migration corridor in the future. Removing barriers within the project area would assure that if downstream barriers are removed, steelhead would have access to suitable habitat in the upper watersheds.

Hanson et al. (2004) cite high summer and fall water temperatures as one of the primary limiting factors to steelhead habitat suitability in the project area. Although water temperatures are typically higher in low gradient valley reaches than in high gradient canyon reaches even in largely undeveloped watersheds, the lack of a dense riparian cover in many reaches of the project area exacerbates high water temperature conditions. Projects R.3-2, R.3-4, R.6-1, R.7-3, R.8-3, R.8-4, and R.10-1 through R.10-5 incorporate some type of riparian habitat enhancement within reaches that may support steelhead in the future. Once established, the proposed increases in riparian cover may help to lower summer and fall water temperatures within the project area. Furthermore, dense riparian vegetation typically promotes bank stability and increases aquatic habitat complexity (i.e., allows for the formation of undercut banks and the recruitment of large woody debris for fish cover). Riparian enhancements are also proposed for a number of stream reaches that have been determined to contain no suitable steelhead habitat, primarily in the Arroyo las Positas watershed. Although these enhancements are not expected to directly improve steelhead habitat quality within the project reaches, the likely increases in channel shading may help to lower the temperatures of stream flows entering Arroyo Mocho and ADLL.

The SMMP includes several projects that are primarily aimed at grade control and bank stabilization. Although fisheries habitat protection and enhancement is not the primary focus of these projects, the overall effect may have beneficial impacts on special status fisheries resources. Grade control structures and bank stabilizations can provide direct environmental benefits to a stream. For example, physical aquatic habitat diversity has been shown to be higher in stabilized reaches than in reaches without grade control structures (Biedenharn and Hubbard, 2001). The higher diversity values are attributed to the scour holes and low-flow channels created by the grade control structures. Grade control structures may also result in the accumulation of gravel, which can improve the spawning habitat for salmonids (Biedenharn and Hubbard, 2001).

Many traditional types of bank protections (i.e., rip-rap, concrete lining) have the potential to adversely impact special-status fisheries habitat by reducing the extent of riparian cover, eliminating instream fish cover features such as undercut banks, and reducing hydraulic channel complexity. However, “fish-friendly”, bio-engineered bank stabilization methods, such as log crib walls, typically have fewer impacts on aquatic habitats and in many cases can actually improve sensitive habitats by reducing erosion and sedimentation, and increasing the stability and density of riparian vegetation.

The placement of various types of rock vanes (e.g., J-hook vanes) for grade control and stream bank protection under projects R.8-3, R.8-4, R.10-1, R.10-4, and R.10-5 are typically considered

an environmentally superior alternative to more traditional hardscape bank protections and concrete drop structures.

Appropriately designed and constructed barrier removals, bank stabilizations, grade controls, and riparian plantings would have long-term beneficial impacts on special-status fish species, particularly steelhead. Short-term adverse impacts associated with the implementation of such projects are discussed with mitigation measures under **Impact 3.6.1** above, and the implementation of **Mitigation Measure 3.6.5a** above would reduce potential long-term impacts of grade control structures on fish passage to less than significant.

Mitigation Measures

Implement **Mitigation Measure 3.6.5a**.

Impact Significance after Mitigation: Beneficial.

**TABLE 3.6-1
SUMMARY OF FISHERIES RESOURCES IMPACTS BY PROJECT**

Reach/Project	Construction Impacts		Long-term Operational Impacts		
	Impact 3.6.1 Special-status Fish Species	Impact 3.6.2 Steelhead Migration And Non-native Predator Species	Impact 3.6.3 Special-status Fish Species	Impact 3.6.4 Hydrology-related Impacts To Special-status species	Impact 3.6.5 Fish Resources
Reach 1					
R.1-1	LSM	n/a	n/a	n/a	n/a
R.1-2	LSM	n/a	n/a	n/a	n/a
R.1-3	LSM	n/a	n/a	n/a	n/a
R.1-4	LSM	n/a	n/a	n/a	n/a
R.1-5	LSM	n/a	n/a	n/a	n/a
R.1-6	LSM	n/a	n/a	n/a	n/a
R.1-7	LSM	n/a	n/a	n/a	n/a
Reach 2					
R.2-1	LSM	n/a	n/a	n/a	n/a
R.2-2	LSM	n/a	n/a	n/a	n/a
R.2-3	LSM	n/a	n/a	n/a	n/a
Reach 3					
R.3-1	LSM	n/a	n/a	n/a	n/a
R.3-2	LSM	LSM	n/a	n/a	B
R.3-3	LSM	n/a	n/a	n/a	n/a
R.3-4	LSM	LSM	n/a	n/a	B
R.3-5	LSM	n/a	n/a	n/a	B
Reach 4					
R.4-1	LSM	n/a	n/a	LSM	n/a
R.4-2	LSM	LSM	n/a	n/a	n/a
Reach 5					
R.5-1	LSM	n/a	n/a	n/a	n/a
R.5-2	LSM	n/a	n/a	n/a	n/a
R.5-3	LSM	n/a	LSM	n/a	n/a
Reach 6					
R.6-1	LSM	n/a	n/a	n/a	B
R.6-2	LSM	n/a	LSM	n/a	n/a
Reach 7					
R.7-1	LSM	LSM	n/a	n/a	n/a
R.7-2	LSM	n/a	n/a	n/a	n/a
R.7-3	LSM	LSM	n/a	n/a	B
Reach 8					
R.8-1	LSM	n/a	n/a	n/a	n/a
R.8-2	LSM	n/a	n/a	n/a	n/a
R.8-3	LSM	n/a	n/a	n/a	B
R.8-4	LSM	n/a	n/a	n/a	B
Reach 9					
R.9-1	LSM	n/a	n/a	n/a	n/a
R.9-2	LSM	n/a	n/a	n/a	n/a
R.9-3	LSM	n/a	n/a	n/a	n/a
R.9-4	LSM	n/a	n/a	n/a	n/a
R.9-5	LSM	n/a	n/a	n/a	n/a
R.9-6	LSM	n/a	n/a	n/a	n/a
R.9-7	LSM	n/a	n/a	n/a	n/a
Reach 10					
R.10-1	LSM	LSM	n/a	n/a	B
R.10-2	LSM	n/a	n/a	n/a	B
R.10-3	LSM	n/a	n/a	n/a	B
R.10-4	LSM	n/a	n/a	n/a	B
R.10-5	LSM	n/a	n/a	n/a	B
Reach 11					
R.11-1	LSM	n/a	n/a	n/a	n/a
R.11-2	LSM	n/a	n/a	n/a	n/a

TABLE 3.6-1 (Continued)
SUMMARY OF FISHERIES RESOURCES IMPACTS BY PROJECT

Reach/Project	Construction Impacts		Long-term Operational Impacts		
	Impact 3.6.1 Special-status Fish Species	Impact 3.6.2 Steelhead Migration And Non-native Predator Species	Impact 3.6.3 Special-status Fish Species	Impact 3.6.4 Hydrology-related Impacts To Special-status species	Impact 3.6.5 Fish Resources
Reach 12					
R.12-1	LSM	n/a	n/a	n/a	n/a
R.12-2	LSM	n/a	n/a	n/a	n/a

LSM = Less than Significant with Mitigation
LTS = Less than Significant
B = Beneficial
N = No Impact n/a = Not Applicable

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3.7 Air Quality

3.7.1 Setting

Regional Setting

Climate and Meteorology

The primary factors that determine air quality are the location of air pollutant sources and the amount of pollutants emitted. However, meteorological and topographic conditions also are important. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

The SMMP project area is within the airshed regulated by the Bay Area Air Quality Management District (BAAQMD). The project area is primarily located in the Livermore-Amador Valley, which is a sheltered inland valley. The mountains of the Coast Range on the west side of this valley are 1,500 to 2,000 feet high, which is high enough to block much of the marine air from reaching the valley. As such, air pollution potential is high, especially in the summer and fall. This valley not only traps locally generated pollutants, but can also receive ozone and ozone precursors from urbanized areas to the west and south (e.g., San Francisco, Oakland, and San Jose) or from San Joaquin Valley, depending on the wind direction (BAAQMD, 1999).

Wind speeds in the project area rank as some of the lowest in the Bay Area, with annual average wind speeds of 4.7 miles per hour (mph). Air temperatures are cooler in winter and warmer in summer because the valley is further from the moderating effect of large water bodies, and because the Coast Range blocks marine air flow. During winter, daily maximum temperatures are in the mid 50's. During the summer, average daily maximum temperatures are in the high 80's to 90 degrees. Average minimum temperatures in winter are in the low to mid 40's. Shielded by the Coast Range to the west, rainfall amounts are relatively low with an annual average of 18.5 inches (BAAQMD, 1999).

Regulatory Agencies

The California Air Resources Board (CARB), California's state air quality management agency, regulates mobile emissions sources and oversees the activities of regional/county air districts. The CARB is responsible for establishing emissions standards for on-road motor vehicles sold in California. The BAAQMD also regulates air pollutant emissions from stationary sources in the Bay Area air basin. Each agency regulates air quality through its permit authority over most types of stationary emission sources and through its planning and review activities. Depending upon the construction activities and equipment used for the projects under the SMMP, Zone 7 would consult with the BAAQMD.

Plans, Policies, and Standards

Regulation of air pollution is achieved through both national and state ambient air quality standards and emissions limits for individual sources of air pollutants. The federal Clean Air Act requires the U.S. Environmental Protection Agency (USEPA) to identify National Ambient Air Quality Standards (national standards) to protect public health and welfare. National standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulate matter (PM₁₀ and PM_{2.5})¹ and lead. These pollutants are called “criteria” air pollutants because standards have been established for each of them to meet specific public health and welfare criteria set forth in the federal Clean Air Act. California has adopted more stringent ambient air quality standards for the criteria air pollutants (referred to as State Ambient Air Quality Standards or state standards) and has adopted air quality standards for some pollutants for which there is no corresponding national standard. **Table 3.7-1** presents both state and national standards.

Under amendments to the federal Clean Air Act, the USEPA has classified air basins or portions thereof, as either “attainment” or “nonattainment” for each criteria air pollutant, based on whether or not the national standards have been achieved. In 1988, the state legislature passed the California Clean Air Act, which is patterned after the federal Clean Air Act to the extent that it also requires areas to be designated as “attainment” or “nonattainment,” but with respect to the state standards rather than the national standards.

Alameda County is included in the nine-county San Francisco Bay Area air basin. The entire Bay Area air basin is designated as “nonattainment” for the state standards for ozone and PM₁₀ (BAAQMD, 2004). Urbanized areas within the Bay Area Air Basin are “nonattainment” for the national 8-hour-average carbon monoxide standard. The Bay Area Air Basin is “attainment” or “unclassified” for the other criteria air pollutants.

Existing Environment

BAAQMD’s regional air quality monitoring network provides information on ambient concentrations of criteria air pollutants. Monitored ambient air pollutant concentrations reflect the number and strength of emissions sources and the influence of topographic and meteorological factors. The closest BAAQMD monitoring station in the SMMP project area is located at 793 Rincon Avenue in Livermore.

Table 3.7-2 presents a five-year summary of air pollutant (concentration) monitoring data collected at these stations. Pollutant concentrations measured at these stations should be generally representative of background air pollutant concentrations in the SMMP project area.

¹ PM₁₀ and PM_{2.5} include particulate matter that is less than or equal to 10 microns and 2.5 microns in size respectively, where a micron is one-millionth of a meter.

**TABLE 3.7-1
STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS**

Pollutant	Averaging Time	State^a	National^b	Attainment Status^d
Ozone	1 hour	0.09 ppm ^c	0.12 ppm	N
	8 hour	NA ^d	0.08 ppm	U
Carbon Monoxide	1 hour	20 ppm	35 ppm	A
	8 hour	9 ppm	9 ppm	A
Nitrogen Dioxide	1 hour	0.25 ppm	NA	A
	Annual	NA	80 µg/m ³ ^c	A
Sulfur Dioxide	1 hour	0.25 ppm	NA	A
	24 hour	0.04 ppm	0.14 ppm	A
Particulate Matter (PM2.5)	24 hour	NA	65 µg/m ³	U
	Annual Arithmetic Mean	12 µg/m ³	15 µg/m ³	U
Particulate Matter (PM10)	24 hour	50 µg/m ³	150 µg/m ³	N/U
	Annual Arithmetic Mean	20 µg/m ³	50 µg/m ³	A
Sulfates	24 hour	25 µg/m ³	NA	A
Lead	30 day	1.5 µg/m ³	NA	A
Hydrogen Sulfide	1 hour	0.03 ppm	NA	A
Vinyl Chloride (chloroethene)	24 hour	0.010 ppm	NA	A
Visibility Reducing Particles	8 hour	see note ^e	see note ^f	NA

^a California standards for ozone, carbon monoxide, sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM10, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded.

^b National standards other than for ozone, particulates and those based on annual averages, are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations are 0.08 ppm or less.

^c ppm = parts per million by volume; µg/m³ = micrograms per cubic meter.

^d A=Attainment; N=Nonattainment; U=Unclassified; NA = Not Applicable.

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

^f USEPA encourages state and tribal communities to participate in regional planning organizations to address visibility.

SOURCE: BAAQMD, 2003. Bay Area Attainment Status as of January 2003.

Ozone

Ozone is not usually emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NOx). ROG and NOx, which are emitted directly into the atmosphere, are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursor presence for approximately three hours in a stable atmosphere with strong sunlight. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production.

**TABLE 3.7-2
ANNUAL AIR POLLUTANT SUMMARY FOR THE SMMP PROJECT AREA (1999–2004)**

Pollutant	Concentrations, by Year ^a						
	Std. ^b	1999	2000	2001	2002	2003	2004
Ozone							
Highest 1-hour-average concentration, ppm ^c	0.09	0.03	0.15	0.11	0.16	0.13	0.11
Number of state violations ^d		0	7	9	10	10	5
Highest 8-hour-average concentration, ppm ^c	0.08	NA	0.11	0.9	0.11	0.09	0.08
Number of federal violations ^d		NA	2	2	6	3	0
Carbon Monoxide							
Highest 1-hour-average concentration, ppm	20	5.2	4.5	5.8	4.8	3.7	0.11
Number of federal violations ^d		0	1	0	2	1	0
Number of state violations ^d	9	0	7	9	10	10	5
Highest 8-hour-average concentration, ppm	9.0	0.3	0.11	0.09	0.11	0.09	0.08
Number of violations ^d		0	2	2	6	3	0
Suspended Particulate (PM2.5)							
Highest 24-hour-average concentration, µg/m ³ ^c	65	63	56	107.5	62	42	35.3
Number of national violations ^d		0	0	1	0	0	0
State annual average, µg/m ³	12	NA	20.9	11.9	14	9	NA
Suspended Particulate (PM10)							
Highest 24-hour-average concentration, µg/m ³	50	28	74.2	114	66	33	29
Number of state violations ^d		NA	11.5	NA	NA	0	NA
State annual average, µg/m ³	20	NA	22	NA	2	19	NA

^a Monitoring data for calendar year 1999 was collected from the Old First Street station in Livermore, which closed in 2000. Monitoring data for years 2000 - 2004 collected from Rincon Avenue station in Livermore.

^b State standard, not to be exceeded.

^c ppm: parts per million; µg/m³: micrograms per cubic meter.

^d Number of violations refers to the number of days in a given year during which standards were exceeded.

NOTE: **Bold** values are in excess of applicable standard. NA = Not Available.

SOURCES: BAAQMD, *Air Quality Data Summaries*, 1999, 2000, 2001, 2002, 2003, 2004.

Carbon Monoxide

Ambient carbon monoxide concentrations are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Carbon monoxide concentrations are also influenced by wind speed and atmospheric mixing. The data in **Table 3.7-2** show a downward trend in carbon monoxide concentrations and indicate that background carbon monoxide concentrations do not approach the state standards, even during stagnant wintertime conditions. However, carbon monoxide concentrations in the vicinity of congested intersections and freeway segments would be expected to be higher than the monitoring data in **Table 3.7-2**. Carbon monoxide concentrations are expected to continue to

decline in the future due to existing controls and programs as well as the continued retirement of older, more polluting vehicles from the mix of vehicles on the road network.

Suspended Particulate Matter (PM_{2.5} and PM₁₀)

PM_{2.5} consists of particulates 2.5 microns (a micron is one one-millionth of a meter) or less in diameter and PM₁₀ consists of particulates 10 microns or less in diameter, which can be inhaled and cause adverse health effects. Particulates in the atmosphere result from many kinds of dust- and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Some of these operations, such as demolition and construction activities, primarily contribute to increases in local concentrations, while others, such as vehicular traffic, affect regional concentrations of particulate matter. **Table 3.7-2** indicates that background PM₁₀ concentrations have decreased over the past five years, although violations of the state 24-hour-average standard still occur on occasion. PM₁₀ concentrations in the Bay Area air basin are expected to increase in the future due to the predicted overall increase in the number of vehicle-miles traveled and the associated increase in entrained paved road dust.

Sensitive Receptors

In general, some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include susceptibility, pre-existing health problems, proximity to the emissions source, or duration of exposure to air pollutants. Land uses such as schools, hospitals, and convalescent homes are considered to be sensitive to poor air quality, because infants and children, the elderly, and people with health afflictions especially respiratory ailments are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also considered to be sensitive to air pollution, because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Such receptors are located in the immediate vicinities of the general locations identified for potential SMMP projects. Refer to **Figure 3.4-1** in the Land Use Section for additional information.

3.7.2 Regulatory Framework

A discussion of local, state and federal regulations that pertain to air quality in the SMMP project area is presented in **Appendix 3.7**.

3.7.3 Air Quality Impacts and Mitigation Measures

Significance Criteria

CEQA Guidelines indicate that a project may be deemed to have a significant effect on the environment if it would 1) conflict with or obstruct implementation of the applicable air quality plan, 2) violate any ambient air quality standard or contribute substantially to an existing or projected air quality violation, 3) result in a cumulatively considerable net increase of any criteria pollutant for which the project regions is non-attainment, 4) expose sensitive receptors to substantial

pollutant concentrations, or 5) create objectionable odors affecting a substantial number of people (Governor's Office of Planning and Research, 2004).

For construction-phase dust impacts, BAAQMD recommends that significance be based on a consideration of the control measures to be implemented (BAAQMD, 1999). If appropriate mitigation measures are implemented to control respirable particulate matter (PM₁₀) emissions, then the impact would be less than significant. BAAQMD Guidelines contain a list of feasible control measures for construction-related PM₁₀ emissions. The BAAQMD Guidelines also indicate that construction-related emissions of criteria pollutants are accounted for in the BAAQMD's emission inventory that is the basis for regional air quality plans; thus, construction-related emissions are not expected to impede attainment or maintenance of ozone or carbon monoxide standards in the Bay Area air basin. Therefore, construction-related emissions of criteria air pollutants are not analyzed further.

BAAQMD Guidelines also include significance criteria for evaluating operational-phase emissions associated with projects. There would be essentially no emissions during the operational phase (i.e., once construction is completed) except for intermittent testing and use of emergency generators. Permits would be required for the emergency generators if greater than 50 horse power. Additionally, all new diesel engines would be subject to the BAAQMD's risk management program. This program allows for three levels of emission control:

- 1) The project is acceptable if the annual emissions would result in an incremental cancer risk equal to or less than one in a million.
- 2) The project is acceptable if the engine emits less than 0.15 grams per brake horsepower-hour (gm/bhp-hr) and the annual emissions would result in an incremental cancer risk equal to or less than ten in a million.
- 3) The project is acceptable if the engine emits less than 0.15 gm/bhp-hr, followed by a catalyst-based diesel particulate filter, and the annual emissions would result in an incremental cancer risk equal to or less than one hundred in a million.

Impacts and Mitigation Measures

Construction Impacts

Impact 3.7.1. Criteria Air Pollutants Emissions: Construction and demolition activities associated with project construction would generate short-term emissions of criteria air pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions. Less than Significant with Mitigation.

Construction or demolition activities associated with the SMMP projects could generate substantial amounts of fugitive dust and PM₁₀ emissions within the proximity of individual project construction sites. Construction activities could include construction of trails, bridges and undercrossings, sediment basins, ponds and wetlands, and culverts; which could require striping, site clearing, materials transport, grading, off-haul, stockpiling, excavation, contouring, pavement removal, and concrete work/paving. An educational center is a component of SMMP project R.3-2.

For the educational structure, construction activities may include materials transport, foundation and structural work, trenching, limited grading, and site clearing.

Projects that include substantial construction activities, including sediment basin construction, wetland creation, and habitat pond construction, would require extensive excavation. Other activities, such as bank stabilization, construction of an education/classroom structure, and widening of channels would also require excavation, although significantly lesser in scope. Trail construction and most of the bank stabilization efforts would require minimal grading, paving, and other activities which would disturb the surface soil. All of these construction activities would require some degree of backfilling, earthmoving, grading, stockpiling and/or compaction, which may expose areas of soil previously been covered with vegetation, to erosion.

Project construction activities would result in temporary, intermittent increases in air emissions, specifically fugitive dust and PM10. Construction air emissions at the SMMP project area would fluctuate depending on the size of ground disturbance and equipment used for an individual project. Primary sources of fugitive dust during construction would include excavation, earth movement, grading, and wind erosion from exposed surfaces. Larger-diameter dust particles (i.e., greater than 30 microns) generally fall out of the atmosphere within several hundred feet of project construction sites, and represent more of a soiling nuisance than a health hazard. The smaller-diameter particles (e.g., PM10) generally remain airborne until removed from the atmosphere by moisture and are associated with adverse health effects.

Construction equipment, on-road heavy-duty trucks, and construction-worker commute vehicles would also generate criteria air pollutant emissions. Heavy-duty trucks would likely be used to transport excavated soil materials from the construction area to disposal or deposition sites established by the contractor. Emissions from construction-worker commute trips would be negligible compared to emissions from heavy-duty hauling trucks. Criteria pollutant emissions of ROG and NOx from these sources would incrementally add to regional atmospheric loading of ozone precursors during the construction period. BAAQMD Guidelines recognize that construction equipment emits ozone precursors, but indicate that such emissions are not expected to impede attainment or maintenance of ozone standards in the Bay Area Air Basin (BAAQMD, 1999).

BAAQMD recommends that significance with respect to construction impacts be based on inclusion of feasible control measures for PM10, and not on quantification of emissions and comparison to thresholds. According to the BAAQMD, if all of the control measures indicated below are implemented (as appropriate, depending on project size), then air emissions from construction activities are considered less than significant (BAAQMD, 1999). See **Table 3.7-3** for a summary of construction-related air quality impacts for each SMMP project.

Mitigation Measures

Mitigation Measure 3.7.1a: At a minimum, contractor(s) shall include the following BAAQMD Basic Control Measures as applicable²:

- Water all active project construction sites at least twice daily, and more often on days when winds exceed 10 to 15 mph.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard.
- Pave, apply water three times daily, or apply non-toxic chemical soil stabilizers on all unpaved access roads, parking areas, and staging areas at project construction sites.
- Sweep daily with water sweepers all paved access roads, parking areas, and staging areas at project construction sites.
- Sweep streets daily with water sweepers if visible soil material is carried onto adjacent public streets.

Mitigation Measure 3.7.1b: For projects with construction areas greater than 4 acres in size, contractor(s) shall include the following additional measures as applicable:

- Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
- Enclose, cover, water twice daily or apply (non-toxic) chemical soil stabilizers to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

Mitigation Measure 3.7.1c: For projects located adjacent to sensitive receptors, contractor(s) shall include the following measures as applicable:

- Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving a project construction site.
- Install wind breaks or plant trees/vegetative wind breaks at windward side(s) of construction areas.
- When winds (instantaneous gusts) exceed 25 mph, water more frequently.
- Limit the area subject to excavation, grading, and other construction activity at any one time.

² Control measures for construction emissions of PM₁₀ were selected from BAAQMD's *CEQA Guidelines for Assessing the Air Quality Impact of Projects and Plans*.

- Designate a person or persons to monitor the dust control program and order increased watering, as necessary, to prevent transport of dust offsite. The name and telephone number of such persons shall be provided to the BAAQMD prior to the start of construction.

Impact Significance after Mitigation: Less than significant.

Long-term Operational Impacts

Impact 3.7.2. Pumps and Other Electrical Components: Emissions associated with long-term operation of SMMP components would be limited to electrical demands associated with pumps, testing and potential use of emergency generators, and from increased employee trips. Emissions from these sources would not be substantial and would not exceed significance criteria of the BAAQMD. Less than Significant.

No operational emissions would result from implementation of projects proposed under the SMMP. Indirect vehicle emissions from worker vehicle trips would not be substantial (less than 1 pound per day for any pollutant) and would not substantially contribute to project operational emissions. Consequently, project operations would not have a significant impact on regional air quality. No mitigation would be required. See **Table 3.7-3** for a summary of operations-related air quality impacts for each SMMP project.

Impact 3.7.3. Odor: Project operation could result in operational odor emissions. Less than Significant.

Implementation of projects proposed under the SMMP would result in negligible odor emissions. Consequently, project operations would not have a significant impact and no mitigation is required. See **Table 3.7-3** for a summary of operations-related odor emissions impacts for each SMMP project.

**TABLE 3.7-3
SUMMARY OF AIR QUALITY IMPACTS BY PROJECT**

Reach/Project	Construction Impact	Long-term Operational Impacts	
	Impact 3.7.1	Impact 3.7.2	Impact 3.7.3
	Criteria Air Pollutants Emissions	Pumps And Other Electrical Components	
Reach 1			
R.1-1	LSM	LTS	LTS
R.1-2	LSM	LTS	LTS
R.1-3	LSM	LTS	LTS
R.1-4	LSM	LTS	LTS
R.1-5	LSM	LTS	LTS
R.1-6	LSM	LTS	LTS
R.1-7	LSM	LTS	LTS
Reach 2			
R.2-1	LSM	LTS	LTS
R.2-2	LSM	LTS	LTS
R.2-3	LSM	LTS	LTS
Reach 3			
R.3-1	LSM	LTS	LTS
R.3-2	LSM	LTS	LTS
R.3-3	LSM	LTS	LTS
R.3-4	LSM	LTS	LTS
R.3-5	LSM	LTS	LTS
Reach 4			
R.4-1	LSM	LTS	LTS
R.4-2	LSM	LTS	LTS
Reach 5			
R.5-1	LSM	LTS	LTS
R.5-2	LSM	LTS	LTS
R.5-3	LSM	LTS	LTS
Reach 6			
R.6-1	LSM	LTS	LTS
R.6-2	LSM	LTS	LTS
Reach 7			
R.7-1	LSM	LTS	LTS
R.7-2	LSM	LTS	LTS
R.7-3	LSM	LTS	LTS
Reach 8			
R.8-1		LTS	LTS
R.8-2	LSM	LTS	LTS
R.8-3	LSM	LTS	LTS
R.8-4	LSM	LTS	LTS
Reach 9			
R.9-1	LSM	LTS	LTS
R.9-2	LSM	LTS	LTS
R.9-3	LSM	LTS	LTS
R.9-4	LSM	LTS	LTS
R.9-5	LSM	LTS	LTS
R.9-6	LSM	LTS	LTS
R.9-7	LSM	LTS	LTS
Reach 10			
R.10-1	LSM	LTS	LTS
R.10-2	LSM	LTS	LTS
R.10-3	LSM	LTS	LTS
R.10-4	LSM	LTS	LTS
R.10-5	LSM	LTS	LTS

TABLE 3.7-3 (continued)
SUMMARY OF AIR QUALITY IMPACTS BY PROJECT

Reach/Project	Construction Impact	Long-term Operational Impacts	
	Impact 3.7.1 Criteria Air Pollutants Emissions	Impact 3.7.2 Pumps And Other Electrical Components	Impact 3.7.3 Odor
Reach 11			
R.11-1	LSM	LTS	LTS
R.11-2	LSM	LTS	LTS
Reach 12			
R.12-1	LSM	LTS	LTS
R.12-2	LSM	LTS	LTS

SU = Significant and Unavoidable
 LSM = Less than Significant with Mitigation
 LTS = Less than Significant
 N = No Impact

References – Air Quality

Bay Area Air Quality Management District (BAAQMD), *Particulate Monitoring Matter Network Description for the Bay Area Air Quality Management District Planning*, BAAQMD Meteorology and Data Analysis Section Air Monitoring Section Technical Services, April 10, 1998.

Bay Area Air Quality Management District (BAAQMD), *BAAQMD CEQA Guidelines, Assessing the Impacts of Projects and Plans*, available online at http://www.baaqmd.gov/pln/ceqa/ceqa_guide.pdf, April 1996, Revised December 1999.

Bay Area Air Quality Management District (BAAQMD), *Air Quality Data Summaries*, 1999, 2000, 2001, 2002, 2003, available online at http://www.baaqmd.gov/pio/aq_summaries/index.asp, accessed May 13, 2004.

Bay Area Air Quality Management District (BAAQMD), *Ambient Air Quality Standards and Attainment Status*, available online at http://www.baaqmd.gov/pln/air_quality/ambient_air_quality.asp, accessed May 22, 2004.

Governor's Office of Planning and Research, *CEQA: California Environmental Quality Act Statutes and Guidelines*, as amended January 1, 2004.

3.8 Noise and Vibration

3.8.1 Setting

Regional Setting

Noise

Pressure waves traveling through air exert a force registered by the human ear as sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) that is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing and 120 dB to 140 dB corresponding to the threshold of pain. Noise, defined as unwanted or disagreeable sound, is usually objectionable because it is disturbing or annoying.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum (20 hertz (Hz) to 20,000 Hz). As a result, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the decreased sensitivity of the human ear to low and extremely high frequencies in comparison to the better sensitivity of the human ear to mid-range frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard method of frequency de-emphasis and is typically applied to community noise measurements. In practice, the level of a sound source is measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. All of the noise levels reported herein are A-weighted unless otherwise stated.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. Noise level is a measure of noise at a given instant in time. Community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources such as aircraft flyovers, moving vehicles, sirens, etc., which are readily identifiable to the individual. These successive additions of sound to the community noise environment cause changes in the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. The time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

Leq:	The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. Leq is the constant sound level that contains the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).
Lmax:	The instantaneous maximum noise level for a specified period of time.
L10:	The noise level that equals or exceeds the Leq, 10 percent of the specified time period. L10 is often considered the maximum noise level averaged over the specified time period.
L90:	The noise level that equals or exceeds the Leq 90 percent of the specified time period. L90 is often considered the background noise level averaged over the specified time period.
DNL or Ldn:	24-hour day and night A-weighted noise exposure level that accounts for greater sensitivity of most people to nighttime noise by weighting noise levels at night (“penalizing” nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noise.
CNEL:	Similar to the DNL, the Community Noise Equivalent Level (CNEL) adds a 5 dBA “penalty” for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10 dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

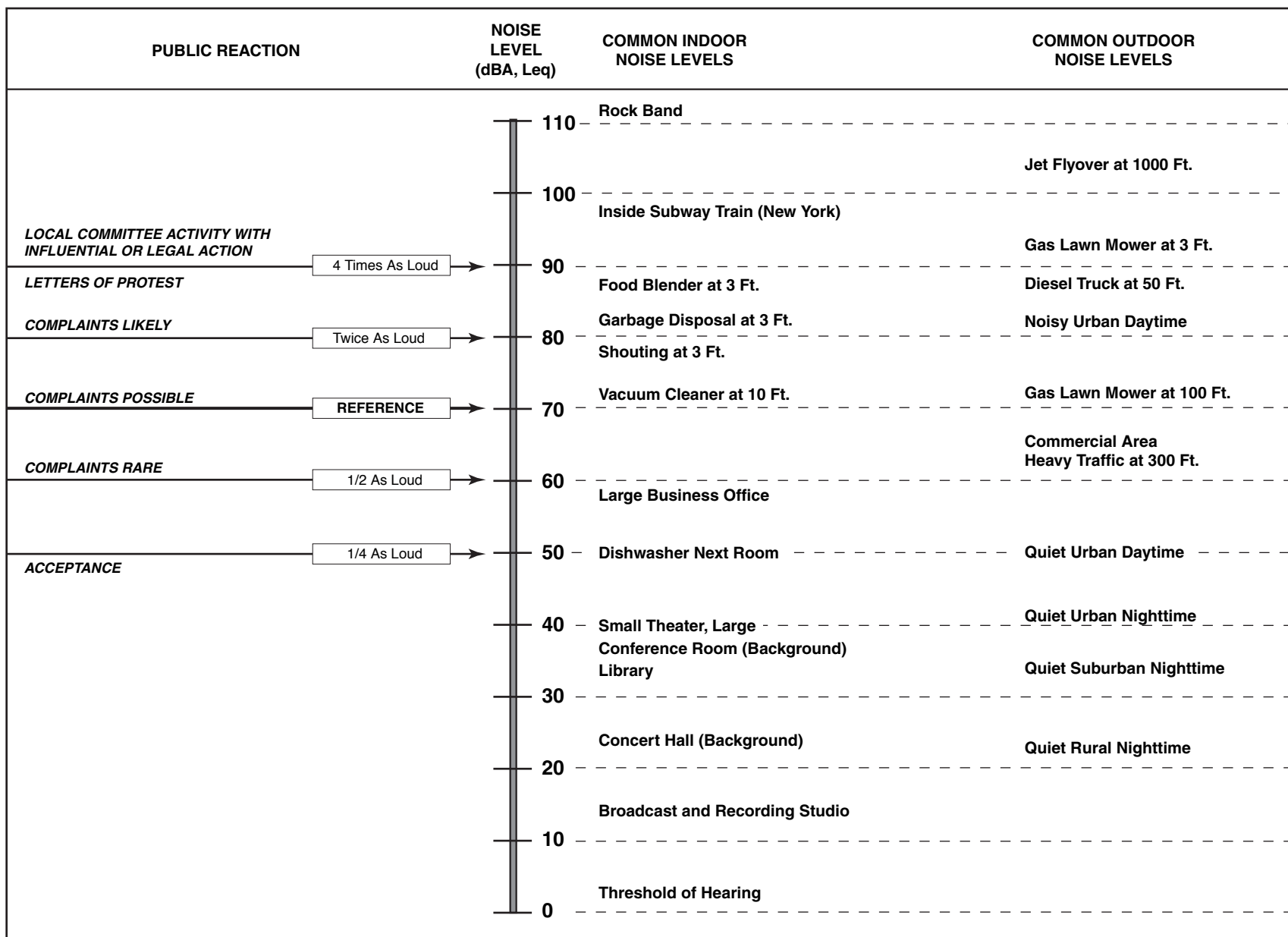
Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance and dissatisfaction;
- Interference with activities such as speech, sleep, learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual’s past experiences with noise. See **Figure 3.8-1** for additional information.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called “ambient noise” level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable it will be for those hearing it.



SOURCE: Caltrans Transportation Laboratory Noise Manual, 1982; and
Modification by Environmental Science Associates

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Figure 3.8-1
Noise Sources and Effects on People

With regard to increases in A-weighted noise level, the following relationships occur (Caltrans, 1998):

- Under controlled conditions in an acoustics laboratory, the trained healthy human ear is able to discern changes in sound levels of 1 dBA;
- Outside of such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise;
- It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA;
- A change in level of 5 dBA is a readily perceptible increase in noise level; and
- A 10-dBA change is recognized as twice as loud as the original source.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. Noise levels are measured on a logarithmic scale instead of a linear scale. On a logarithmic scale, the sum of two noise sources of equal loudness is 3 dBA greater than the noise generated by only one of the noise sources (e.g., a noise source of 60 dBA plus another noise source of 60 dBA generate a composite noise level of 63 dBA). To apply this formula to a specific noise source, in areas where existing levels are dominated by traffic, a doubling in the volume of the traffic would increase ambient noise levels by 3 dBA. Similarly, a doubling in the use of heavy equipment, such as use of two landfill dozer/compactors where formerly one was used, would also increase ambient noise levels by 3 dBA. A 3 dBA increase in the noise level is the smallest change detectable to the average person. A change in ambient sound of 5 dBA can start to create concern among neighbors. A change in sound of 7 to 10 dBA typically brings calls to government officials and letters to the newspaper.

Existing Noise Environment

The existing noise environment in Alameda County is the result of many noise sources, however, transportation systems are the largest contributors. Interstate 580 (I-580) is an eight-lane freeway that runs east-west north through the SMMP project area. I-680 provides connection to I-580, State Route (SR) 24 and SR 84. SR 84 is a two-lane arterial road in the project vicinity along Vallecitos Road. Where hills shield the freeway noise, noise levels are substantially lower than where there is a direct exposure to the freeway noise. Aircraft operations at Livermore Airport also contribute to the noise environment. Other noise sources which occasionally represent problems include emergency medical vehicles, public transit vehicles, power tools, and machinery.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas generally are more sensitive to noise than are commercial and industrial land uses. **Table 3.8-1** shows the various sensitive receptors in the SMMP project area.

TABLE 3.8-1
SENSITIVE RECEPTORS WITHIN THE SMMP PROJECT AREA

Reach/Project	Residential Development	Hospitals	Schools
Reach 1	✓		✓
Reach 2	✓		✓
Reach 3	✓		✓
Reach 4	✓		✓
Reach 5	✓		✓
Reach 6	✓	✓	✓
Reach 7	✓		✓
Reach 8	✓	✓	✓
Reach 9	✓		✓
Reach 10	✓		✓
Reach 11	None	None	None
Reach 12	None	None	None

3.8.2 Regulatory Framework

A discussion of local, state and federal regulations that pertain to noise and vibration in the SMMP project area is presented in **Appendix 3.8**.

3.8.3 Noise Impacts and Mitigation Measures

Significance Criteria

Noise

Based on CEQA Guidelines (Governor's Office of Planning and Research, 1996), a project may be deemed to have a significant effect on the environment if it would increase substantially the ambient noise levels for adjoining areas. With regard to increases in A-weighted noise level, it is widely accepted that the average person can barely perceive noise level changes of 3 dBA, while a change in noise levels of 5 dBA is a readily perceptible increase in noise levels and the minimum required increase for a change in community reaction (Caltrans, 1998; U.S. DOT, 1990). With temporary noise impacts, identification of "substantial increases" depends upon the duration of the impact, the temporal daily nature of the impact, as well as the absolute change in dBA levels and the time of day in which the noise occurs.

For the purposes of this EIR, construction-related noise is considered significant if it is predicted to exceed the noise level standards contained in **Table A.3.8-2** in **Appendix 3.8** at the property line of nearby sensitive receptors during the period from 7:00 a.m. to 10:00 p.m. on weekdays, and 8:00 a.m. to 5:00 p.m. on Saturdays and Sundays.

Vibration

With respect to ground-borne vibration, substantial vibrations from construction activities that could damage property would be considered significant. The impact analysis considers two principal vibration-related concerns:

- The potential for sleep disturbance or interruption of normal living activity; and
- The potential for facility damage.

Impacts and Mitigation Measures

Construction Impacts

Impact 3.8.1. Increased Noise Levels: Construction activities would intermittently and temporarily generate noise levels above existing ambient levels in the vicinity of individual SMMP project sites. Less than Significant with Mitigation.

Construction or demolition activities associated with the SMMP could generate higher levels of noise within the proximity of individual project construction sites. As described in **Chapter 2, Project Overview and Description**, construction activities could include construction of trails, bridges and undercrossings, sediment basins, ponds and wetlands, and culverts; which could require striping, site clearing, materials transport, grading, off-haul, stockpiling, excavation, contouring, pavement removal, and concrete work/paving. An educational center is a component of SMMP project R.3-2. For the educational structure, construction activities may include materials transport, foundation and structural work, trenching, limited grading, and site clearing. Fish barrier structure removal and replacement could include damming, materials transport, off-haul, and barriers to isolate work area.

Projects that include substantial construction activities, including sediment basin construction, wetland creation, and habitat pond construction, would require extensive excavation. Other activities, such as bank stabilization, construction of an education/classroom structure, widening of channels, would also require excavation, although significantly less. Trail construction and most of the bank stabilization efforts would require minimal grading, paving, and other activities which would disturb the surface soil. All of these construction activities would require some degree of backfilling, earthmoving, grading, stockpiling and/or compaction, which may expose areas of soil previously been covered with vegetation, to erosion.

Construction of the SMMP projects would result in temporary intermittent increases in ambient noise levels, and could potentially result in groundborne vibration or noise levels. Construction noise levels in the project area would fluctuate depending on the particular type, number, and duration of use of construction equipment. The effect of construction noise would depend on the volume generated and the distance between construction activities and noise-sensitive receptors. **Table 3.8-2** shows typical noise levels produced by various types of construction equipment.

**TABLE 3.8-2
CONSTRUCTION EQUIPMENT NOISE LEVELS AND ABATEMENT POTENTIAL**

Equipment	Noise Level (dBA) at 50 Feet	With Feasible Noise Controls ^a
Earthmoving		
Front Loader	79	75
Backhoe	85	75
Dozer	80	75
Tractor	80	75
Scraper	88	80
Grader	85	75
Paver	89	80
Materials Handling		
Concrete Mixer	85	75
Concrete Pump	82	75
Crane	83	75
Stationary		
Pump	76	75
Generator	78	75
Impact		
Jack Hammer	88	75
Pneumatic Tools	86	80
Other		
Saw	78	75
Vibrator	76	75

a Estimated levels obtainable by selecting quieter procedures or machines and implementing noise-control features requiring no major redesign or extreme cost.

SOURCE: *Handbook of Noise Control*, Cyril M. Harns, 1979; *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, U.S. Environmental Protection Agency, 1971.

Noise from construction equipment and haul trucks that would access the project construction sites could result in higher noise levels that could exceed local thresholds when operated without noise controls and in areas near residences. Without noise controls and other mitigation measures, noise impacts by construction or demolition activities could have a significant temporary impact, particularly if the construction sites are located near sensitive receptors close to a project construction site.

Although construction-generated noise levels may not remain within the limits provided in **Table 3.8-2** in **Appendix 3.8** for acceptable noise limits for sensitive receptor land uses in Alameda County, this would be an intermittent and temporary situation and does not represent a serious or long-term impact.

Implementation of mitigation to address potential offsite noise impacts would reduce all impacts from construction activities to less-than-significant levels. See **Table 3.8-3** for a summary of construction-related noise and vibration impacts for each SMMP project.

Mitigation Measures

Mitigation Measure 3.8.1a: To comply with the noise standards and other provisional requirements, review potential construction noise impacts at the project-level for specific facilities or management plans proposed under the SMMP and implement additional mitigation measures, if appropriate, including but not limited to:

- Construction hours shall be limited to from 8:00 a.m. and 5:00 p.m. on weekdays.
- Impact tools used for project construction shall be hydraulically or electrically powered wherever possible. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed-air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to 10 dBA. External jackets on the tools themselves shall be used where feasible, which could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever feasible.
- Noise control measures shall be applied to construction equipment. Equipment and trucks used for project construction shall utilize normal noise control techniques (e.g., mufflers in good working order).
- A compliance-monitoring program shall be implemented in order to stay within the parameters of project-specific compliance documents. The compliance-monitoring program shall oversee these mitigation measures and would include reporting protocols. The compliance-monitoring program may entail posting signs at project construction sites that include permitted construction days and hours, and a day and evening contact number for the project construction site.
- Construction activities shall be planned so that additive noise is minimized (e.g., avoid concurrent use of loud construction equipment) in order to reduce the duration in which a sensitive receptor is affected by noise.
- The proximity of construction noise to sensitive receptors shall be limited. Stationary noise sources, such as diesel generators, shall be located as far from sensitive receptors as possible. Haul-trucks and other construction equipment shall be restricted to routes that practicably avoid sensitive receptors.
- Appropriate measures shall be taken to control pedestrian access to active construction areas. Recreational users should be kept at a safe distance from the operation of construction equipment.

Mitigation Measure 3.8.1b: Construction contractors shall locate fixed construction equipment such as compressors as far as possible from noise-sensitive receptors during construction.

Impact Significance after Mitigation: Less than significant.

Long-term Operational Impacts

Impact 3.8.2. Increased Noise Levels: Operational activities of certain SMMP projects would have the potential to generate noise levels above existing ambient levels in the project vicinity. Less than Significant with Mitigation.

Project operation would not contribute increased operational noise levels or result in conditions that may deteriorate ambient noise levels. Implementation of the proposed SMMP could allow additional noise sources, associated with the operation of the new facilities and activities. The amount of vehicular traffic to SMMP project facilities, particularly those related to new public uses, is expected to grow, resulting in additional noise along roadways leading to and from the projects; however, the amount of the increase can not be determined at the MEIR level. Potential visitor activities such as recreation and educational field trips and maintenance activities could also contribute noise to the environment. It is not anticipated that implementation of the SMMP would result in operational activities or public uses that would generate excessive ground-borne vibrations or noise levels.

Potential operational noise impacts would depend on the size, location, and use of potential facilities. Similar to construction impacts, project operation would fluctuate depending on the particular type, number, and duration of use of construction equipment. The effect of operational noise would depend on the volume generated and the distance between operational activities and noise-sensitive receptors.

SMMP flood protection structures and other facilities would be associated with noise impacts during routine maintenance activities, such as annual sediment removal, annual or semi-annual vegetation maintenance, and periodic structural maintenance/repair. While the extent of operational maintenance activities is expected to be significantly less than during the construction phase, some of the construction equipment listed in **Table 3.8-2** would be employed during maintenance activities. Public use facilities would be associated with noise impacts from recreational users (i.e., conversation, yelling), as well as routine maintenance activities such as pavement or trail surface repair, and replacement of signage. These impacts could be significant. Implementation of **Mitigation Measure 3.8.2a** would reduce the potential impact to less than significant at the MEIR level. See **Table 3.8-3** for a summary of construction related noise and vibration impacts for each SMMP Project.

Mitigation Measures

Mitigation Measure 3.8.2a: The effects of noise resulting from the use or operation of new facilities shall be analyzed to ensure consistency with relevant local noise ordinances. The design of new facilities shall incorporate specifications that prevent significant noise impacts on nearby residences.

- Operation of maintenance equipment shall abide by the local noise ordinances.
- Speed limits shall be placed on roads managed under the SMMP to reduce noise levels caused by motor vehicle traffic.

Impact Significance after Mitigation: Less than significant.

**TABLE 3.8-3
SUMMARY OF NOISE IMPACTS BY PROJECT**

Reach/Project	Construction Impacts	Long-term Operational Impacts
	Impact 3.8.1 Increased Noise Levels	Impact 3.8.2 Increased Noise Levels
Reach 1		
R.1-1	LSM	LSM
R.1-2	LSM	LSM
R.1-3	LSM	LSM
R.1-4	LSM	LSM
R.1-5	LSM	LSM
R.1-6	LSM	LSM
R.1-7	LSM	LSM
Reach 2		
R.2-1	LSM	LSM
R.2-2	LSM	LSM
R.2-3	LSM	LSM
Reach 3		
R.3-1	LSM	LSM
R.3-2	LSM	LSM
R.3-3	LSM	LSM
R.3-4	LSM	LSM
R.3-5	LSM	LSM
Reach 4		
R.4-1	LSM	LSM
R.4-2	LSM	LSM
Reach 5		
R.5-1	LSM	LSM
R.5-2	LSM	LSM
R.5-3	LSM	LSM
Reach 6		
R.6-1	LSM	LSM
R.6-2	LSM	LSM
Reach 7		
R.7-1	LSM	LSM
R.7-2	LSM	LSM
R.7-3	LSM	LSM
Reach 8		
R.8-1	LSM	LSM
R.8-2	LSM	LSM
R.8-3	LSM	LSM
R.8-4	LSM	LSM
Reach 9		
R.9-1	LSM	LSM
R.9-2	LSM	LSM
R.9-3	LSM	LSM
R.9-4	LSM	LSM
R.9-5	LSM	LSM
R.9-6	LSM	LSM
R.9-7	LSM	LSM

**TABLE 3.8-3 (continued)
SUMMARY OF NOISE IMPACTS BY PROJECT**

Reach/Project	Construction Impacts	Long-term Operational Impacts
	Impact 3.8.1 Increased Noise Levels	Impact 3.8.2 Increased Noise Levels
Reach 10		
R.10-1	LSM	LSM
R.10-2	LSM	LSM
R.10-3	LSM	LSM
R.10-4	LSM	LSM
R.10-5	LSM	LSM
Reach 11		
R.11-1	LSM	LSM
R.11-2	LSM	LSM
Reach 12		
R.12-1	LSM	LSM
R.12-2	LSM	LSM

SU = Significant and Unavoidable
LSM = Less than Significant with Mitigation
LTS = Less than Significant
N = No Impact

References – Noise and Vibration

- Alameda County, Noise Element of the Alameda County General Plan, Adopted July 31, 1994 and Amended May 5, 1994
- Alameda County, *East County Area Plan*, Adopted: May, 1994, Corrected: March, 1996, Amended: September, 1996, July, 1998, and November, 2000, Adopted: May 2002.
- Alameda County General Ordinance Code, Title 6 Health & Safety, Chapter 6.60 Noise, available online at: <http://www.acgov.org/admin/admincode/index.htm>, 2003.
- California Department of Transportation (Caltrans), *Traffic Noise Analysis Protocol for New Highway Construction and Highway Reconstruction Projects*, October 1998.
- Caltrans, 2002. Transportation Related Earthborne Vibrations. November 2002.
- Governor's Office of Planning and Research, *CEQA: California Environmental Quality Act Statutes and Guidelines*, December 1996.
- Harns, Cyril M., *Handbook of Noise Control*, 1979.
- U.S. Department of Transportation (U.S.DOT), Urban Mass Transportation Administration, *Guidance Manual for Transportation, Noise and Vibration Impact Assessment*, July 1990.
- U.S. Environmental Protection Agency (U.S. EPA), *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, 1971.
- U.S. EPA, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. *March 1974.*

3.9 Traffic and Circulation

3.9.1 Setting

Regional Setting

Traffic

The project area lies within the Livermore-Amador Valley, which is served by an extensive roadway network that includes freeways, state routes, and urban and rural surface streets.

Figure 3.9-1 shows the roadway network. Interstate 580 (I-580) is an eight-lane freeway that runs east-west through the SMMP project areas. I-580 connects to a number of other regional facilities, including I-80, I-238, I-680, I-980, and State Route (SR) 84. I-680 is a six-lane freeway that runs north to south. I-680 connects to I-580, SR 24, and SR 84. SR 84 is a two-lane arterial road in the project vicinity along Vallecitos Road. Urban and rural surface streets include arterial, collector, or local streets. These streets are designed primarily based on the circulation function of the roadway, but also on the width and number of lanes. Definitions of these roadway types, as generalized from the Circulation Elements of the *East County Area Plan* (ECAP) (Alameda County, 2002), City of Pleasanton General Plan (1996), City of Dublin General Plan (2002), and City of Livermore General Plan (2004), are as follows:

Freeways¹ State-designated, high-speed, high-capacity routes serving statewide and interregional circulation needs. Freeways are characterized by limited access and grade separations. In urban areas, freeways are typically six- to ten-lane divided facilities.

Arterial Streets² Roadways that feed traffic to freeways, provide access to adjacent land uses primarily at intersections, and feature traffic control measures. Arterials may be two to eight lanes.

Collector Streets³ Relatively low-speed, medium-capacity streets that provide access to adjacent land uses and feed local traffic to arterials. Collector streets are typically two- to four-lane facilities.

Local Streets. Low-speed, low-capacity roadways that provide for circulation within neighborhoods (land uses in commercial and residential areas), with direct access to abutting land uses. Local streets are typically two lanes.

Average Daily Traffic (ADT). ADT is the number of vehicles that travel along a road within an identified limit for a particular day. ADT counts are taken for a full 24 hours, so both morning and night counts are included with each count.

¹ The City of Livermore distinguishes freeways and highways based on the number of lanes. However, the ECAP and the City of Pleasanton General Plan do not make this differentiation.

² The City of Livermore uses the term “major streets”. Major street is defined as a local, medium-speed, high-capacity routes for intracity, cross-town travel and local access to freeways, highways, and the subregional road system. Major streets are typically four- and six-lane divided facilities. Major streets have a broader definition than arterials, but for the purposes of this MEIR, a “major street” is considered equivalent to an “arterial street.”

³ The City of Pleasanton also includes a category for “neighborhood collector street,” which is a roadway that provides access to residential areas and feeds traffic to arterials.

Annual Average Daily Traffic (AADT). AADT is the number of vehicles that traveled along a road within an identified limit averaged over the period of one year.

Existing Environment

Roadway Demand and Capacity

Traffic volume is measured in terms of ADT and peak-hour traffic volumes. Average traffic is the total number of vehicles on a roadway, in both directions, on an average day. Peak-hour traffic reflects the total number of vehicles on a roadway during the busiest hour of the morning or afternoon. The average traffic volumes for selected roadway segments in the cities of Pleasanton, Dublin, and Livermore and in unincorporated Alameda County are shown in **Table 3.9-1**. The latest counts available from 2004 and 2005 are primarily for major arterial and collector streets.

Transit Services

The Livermore-Amador Valley Transit Authority (LAVTA) also known as “Wheels”, the Bay Area Rapid Transit (BART), BART Express, and private shuttle services provide transit services in Livermore, Pleasanton, and/or unincorporated sections of Alameda County within the project area.

Bicycle Trail Network

Class I through class III bicycle facilities are located throughout the Project area. Class I bicycle paths provide a completely separated right-of-way with minimal cross-flow for the exclusive use of bicycles and pedestrians (Alameda County, 1993). Class II bike lanes provide a striped lane for one-way travel on a street or highway. Class III bicycle routes provide for shared use with pedestrian or motor vehicle traffic. Within the project area, the majority of the bicycle facilities are located in an urban setting.

3.9.2 Regulatory Framework

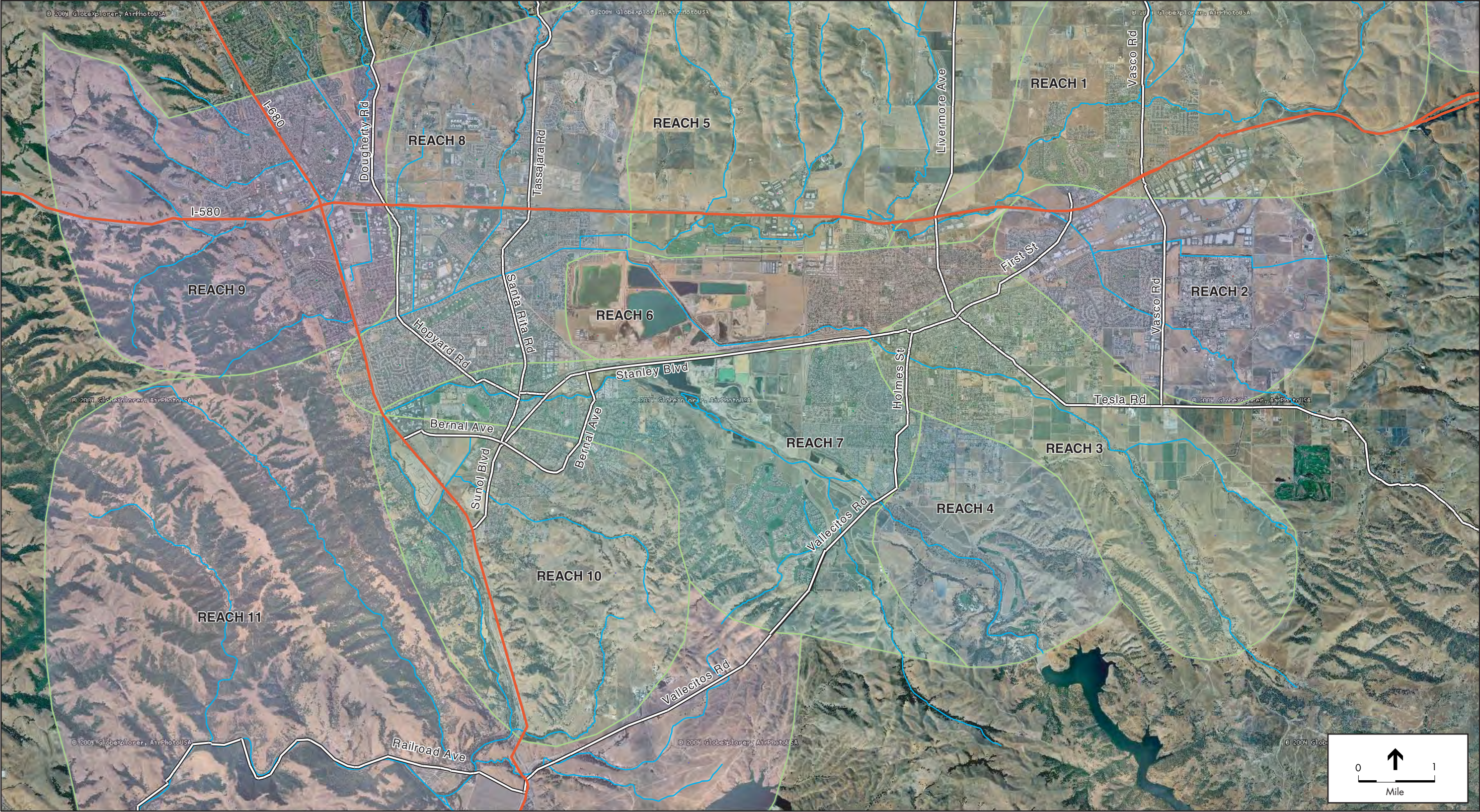
The policies and regulations associated with traffic within the project area and applicable jurisdictions are presented in **Appendix 3.9** of this MEIR.

3.9.3 Traffic Impacts and Mitigation Measures

Significance Criteria

The CEQA Guidelines indicate that a project would normally result in an impact to transportation and traffic if it would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

For the purposes of this MEIR and consistent with Appendix G of the CEQA Guidelines, a project is considered to have a significant traffic impact on the environment if it would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.



SOURCE: Environmental Science Associates

Zone 7 SMMP . 203485
Figure 3.9-1
SMMF Project Reaches on Road Based Map

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**TABLE 3.9-1
AFFECTED ROADWAYS LOCATED WITHIN THE PROJECT AREA**

Reach	Functional Classification	Jurisdiction	Roadway	Segment or Intersection	ADT
Reach 1	Collector Street	Livermore	Broadmoor St	Scenic Ave and Greenwich	3,835
	Major Street	Livermore	Vasco Rd	N/O Preston Ave	36,889
	Freeway	Livermore	I-580	Vasco Rd	146,000 ^a
	Major Street	Livermore	Springtown Ave	S/O Bluebell	24,145
	Collector Street	Livermore	Bluebell Dr	S/O Scenic Ave	3,698
Reach 2	Major Street	Livermore	Patterson Pass	E/O Vasco Rd	4,540
	Major Street	Livermore	First St	S/O I-580 WB Ramps	49,271
	Major Street	Livermore	Las Positas Rd	E/O Vasco Rd	6,820
	Collector Street	Livermore	Charlotte Way	Marcella to Ursula	3,740
Reach 3	Rural Route	Livermore	Concannon Blvd	S/O Livermore Ave	11,276
	Rural Route	Livermore	Arroyo Rd	N/O Robertson Park Dr.	11,222
	Major Street	Livermore	Stanley Blvd	W/O Isabel Ave Ramp	28,042
	Major Street	Livermore	Holmes St	S/O Elaine Ave	35,823
	Highway	Livermore	Isabel Ave	N/O Concannon	14,516
Reach 4	Major Street	Livermore	Holmes St	S/O Elaine Ave	35,823
	Rural Route	Livermore	East Vineyard Ave	W/O Isabel Ave	8,423
	Highway	Livermore	East Vallecitos Rd	S/O Isabel Ave	27,426
	Major Street	Livermore	Portola Ave	Portola Meadows and Alviso	26,380
Reach 5	Freeway	Livermore	I-580	North Livermore Ave	168,000 ^a
	Major Street	Livermore	Airway Blvd	S/O North Canyons Parkway	28,551
	Highway	Livermore	Isabel Ave	N/O Stanley Blvd Ramp	14,521
Reach 6	Highway	Livermore	Isabel Ave	N/O Stanley Blvd Ramp	14,521
	Major Street	Pleasanton	Stanley Blvd	E/O Bernal Ave	
Reach 7	Major Street	Pleasanton	Valley Ave	W/O Hopyard	14,100
	Major Street	Pleasanton	Vineyard Ave	E/O Stanley Blvd	6,000
	Major Street	Pleasanton	Hopyard Rd	E/O Santa Rita	8,400
	Major Street	Pleasanton	Stanley Blvd	E/O Bernal Ave	21,500
	Major Street	Pleasanton	El Charro Road		
Reach 8	Major Street	Pleasanton	Hopyard Rd	N/O West Las Positas	12,500
	Major Street	Pleasanton	Stoneridge Dr	W/O Hopland	259,000
	Major Street	Pleasanton	W. Las Positas Blvd	N/O Stoneridge	11,100
	Freeway	Pleasanton	I-580	Tassajara Road	190,000 ^a

TABLE 3.9-1 (continued)
AFFECTED ROADWAYS LOCATED WITHIN THE PROJECT AREA

Reach	Functional Classification	Jurisdiction	Roadway	Segment or Intersection	ADT
Reach 9	Freeway	Dublin	I-680 North of I-580	JCT Route 580	171,000 ^a
		Dublin	Amador Valley Blvd	W/O Stagecoach Road	6,571
		Dublin	Dublin Blvd	W/O I-680	30,670
		Dublin	San Ramon Rd	N/O Amador Valley Blvd	29,343
	Major Street	Pleasanton	Village Parkway	N/O Amador Valley Blvd	14,970
Reach 10	Freeway	Pleasanton	I-680	Sunol Road	128,000 ^a
Reach 11	Freeway	Unincorporated Alameda County	I-680	Alameda County	171,000 ^a
Reach 12	Freeway	Unincorporated Alameda County	I-580	San Joaquin-Alameda County line	42,000 ^a

^a 2004 Caltrans Count AADT data

N/O = North of; S/O = South of; E/O = East of; W/O = West of

SOURCE: City of Pleasanton General Plan, City of Livermore General Plan, 1996; City of Dublin Public Works, 2002; City of Livermore Public Works, 2003; City of Pleasanton Public Works, 1998

The project is also considered to have a potentially significant impact if the following occurs:

- Construction activities significantly impede access to adjacent land uses, including emergency access;
- Construction activities pose a traffic safety hazard to motor vehicles, bicyclists, or pedestrians in areas where there is a history of accident problems (i.e., a high number of accidents and/or an accident rate higher than the statewide average for similar roads);
- Construction activities significantly affect local transit service;
- Construction substantially affects parking availability, causing traffic safety or operational problems; or
- Movement of heavy vehicles causes substantial damage or wear of public roadways.
- Direct impacts due to the construction of project components would be short term in nature. Occasional post-construction maintenance activities would briefly affect local segments only; these impacts would be less than significant. The duration of potentially significant impacts related to the short-term disruption of traffic flow and increased congestion generated by construction vehicles would be limited to the period of time needed to complete construction of the project components. Therefore, measures identified in this MEIR are focused on reducing these short-term construction effects; long-term mitigation measures are not needed.

Impacts and Mitigation Measures

Implementation of the proposed SMMP would allow flood control and stream management within the cities of Livermore, Pleasanton, Dublin, and unincorporated areas of Alameda County. Facilities that would be constructed under the SMMP include for example, sediment basins, new channels and channel improvements, riparian corridor improvements, new bridges and bridge improvements, trails, a classroom education center, and kiosks. Construction or demolition activities associated with the SMMP projects could result in traffic and circulation-related impacts.

Projects that include substantial construction activities, such as the bridge, educational center, and kiosks would likely require more truck trips than other activities such as vegetation management, invasive species control, and fish barrier removal. Trail construction and most of the bank stabilization projects would require minimal grading, paving, and other activities that could disturb the flow of pedestrian traffic. The actual project footprints would vary depending on site location. Equipment and material staging would be accommodated within the site to the extent feasible, but would not likely directly affect adjacent roadways.

Construction Impacts

Impact 3.9.1. Short-term Traffic: Implementation of individual SMMP projects would generate short-term constructed-related traffic. Truck trips and worker trips would increase short-term traffic delays for vehicles traveling past the construction zone on roadways serving project components. Less than Significant with Mitigation.

As identified in **Table 2-6 in Chapter 2, Project Description**, majority of SMMP projects would involve short-term construction durations of two weeks to eight months and would be implemented during dry weather. Of the 45 projects, 10 would likely have construction durations of over one year. Construction crews for individual projects are expected to include less than 30 workers.

Vehicle trips generated offsite during the construction of the various project components would primarily involve truck movements associated with the delivery of construction materials and equipment to the work sites, hauling of excavated soils or debris from the sites, and the daily arrival and departure of construction workers. Construction activity would generate short-term increases in vehicle trips by construction workers and construction vehicles on area roadways. Construction-generated traffic would be temporary and therefore would not result in the long-term degradation of roadway operating conditions or level of service (LOS) within the SMMP project area. The primary off-site impact resulting from the movement of construction trucks would involve a short-term and intermittent lessening of roadway capacities due to the slower movements and larger turning radii of the trucks compared to passenger vehicles. Additionally, construction activities could increase localized demands for parking, particularly within urbanized portions of the SMMP project area.

The percent increase in traffic volumes caused by project-generated construction traffic on the I-580 and I-680 freeways would not be substantial (falling within the daily fluctuations of traffic volumes), nor would project traffic significantly disrupt daily traffic flow. Construction-related

truck traffic occurring on weekdays during the hours of 7:00 to 9:00 a.m. and 3:00 to 5:00 p.m. would coincide with peak-period traffic volumes on area roadways, and therefore would have the greatest potential to impede traffic flow. However, project-generated traffic would be dispersed throughout the eight-hour work day, lessening the effect on traffic conditions in any one hour. The highest number of hourly one-way truck trips (estimated to be a maximum of one truck every three minutes) would not cause significant traffic delays. Therefore, the short-term increase in vehicle trips would not significantly affect LOS on area roadways.

LOS standards for roadways that are part of the Alameda County Congestion Management Program network are intended to regulate long-term traffic increases from operation of new development, and do not apply to temporary construction projects. As such, the proposed SMMP improvements would not exceed the LOS standards established by the Alameda County Congestion Management Agency for designated Congestion Management Program roadways.

Pedestrian bridge construction and modification are components of some trail projects and could result in short-term access impacts, however, these impacts would be reduced to less-than-significant levels with implementation of **Mitigation Measures 3.9.1a** and **3.9.1b**.

Mitigation Measures

Mitigation Measure 3.9.1a: Zone 7 shall arrange for a detailed traffic control plan as required for individual SMMP projects to be prepared by a licensed traffic engineer. The traffic control plan shall comply with requirements of the jurisdictional agency directly affected by the project construction. The traffic control plan would include, but would not be limited to, the following elements:

- Zone 7 or its contractors shall restrict construction to non peak periods as required for specific work sites.
- Zone 7 or its contractors shall coordinate construction activities (time of year and duration) to minimize traffic disturbances adjacent to schools and commercial areas.
- Zone 7 or its contractors shall post advanced warning of construction activities.
- Zone 7 or its contractors shall provide temporary signage indicating that businesses are open.

Mitigation Measure 3.9.1b: Zone 7 shall require off-street parking for construction workers' vehicles, or, if that is impractical, workers could be shuttled to the work site from an off-site location.

Impact Significance after Mitigation: Less than significant.

Impact 3.9.2. Transit Service Disruption: Construction activities associated with the implementation of individual SMMP projects could disrupt transit service. Less than Significant with Mitigation.

LAVTA and BART Express operate bus services within the SMMP project area. Bus lines generally follow major roadways such as arterial and collector streets. Depending on the location of the construction activities and access, implementation of individual SMMP projects could disrupt bus operations by blocking bus stops or delaying bus service due to lane closures. However, because of the in-channel nature of proposed facilities, the potential for this type of disruption is considered low. Implementation of **Mitigation Measures 3.9.2a** would minimize delays to transit services caused by increased traffic congestion within construction areas. For direct impacts to bus stops, Zone 7 would coordinate with LAVTA and/or BART Express to develop a plan that would relocate bus stops during the course of construction activities, which would reduce potential impacts to less-than-significant levels.

Mitigation Measures

Mitigation Measure 3.9.2a: This measure applies to construction activities that would displace bus stops. As part of the traffic control plan for roadway segments and intersections (see **Mitigation Measure 3.9.1a**), Zone 7 shall incorporate a plan, as needed, for the temporary relocation of bus stops. This plan would be completed in coordination with LAVTA or BART Express.

Impact Significance after Mitigation: Less than significant.

Impact 3.9.3. Adjacent Land Use Access: Construction could affect access to adjacent land uses, emergency facilities and streets used for general and emergency access, potentially causing safety hazards. Less than Significant with Mitigation.

Project construction could restrict emergency access, as well as bicycle, pedestrian, and vehicle access to adjacent land uses and streets. The blockage of access may result in increased safety hazards. Access for emergency vehicles would impede either directly by the blockage of an entrance to the emergency facility or affected land use, or indirectly due to increased roadway congestion or reduction of available lanes. Implementation of **Mitigation Measures 3.9.3a** through **3.9.3c** would ensure that access is maintained at emergency facilities and affected land uses, thereby reducing potential impacts associated with access blockage to less-than-significant levels. **Mitigation Measures 3.9.1a** and **3.9.1b** would reduce potential impacts associated with short-term increase in traffic with preparation and implementation of a traffic control plan.

There are multi use and bicycle trails adjacent to several stream channels in the project area. Construction of individual projects could temporarily disrupt access to existing or proposed bicycle paths within the SMMP project area during construction activities. To minimize any potentially significant impacts, Zone 7 would reroute bicycle access or provide temporary trail

access, as appropriate (see **Mitigation Measure 3.9.3d**). Recreational impacts associated with the disruption of trails are discussed in **Section 3.4, Land Use**.

Residential, commercial, and public uses (e.g., parks) are located throughout the Valley. Public uses such as parks and community centers typically have multiple access points, whereas residences and businesses typically have only one access point. Construction of individual projects could temporarily block or affect access. However, advanced notification of access restrictions would reduce potential impacts to affected residents and businesses (see **Mitigation Measure 3.9.3e**). With implementation of the measures identified below, construction-related access impacts would be reduced to less-than-significant levels.

Mitigation Measures

Mitigation Measure 3.9.3a: As part of the traffic control plan for roadway segments and intersections (see **Mitigation Measure 3.9.1a**), Zone 7 shall develop comprehensive strategies for maintaining emergency access. Also, police, fire, and emergency service providers shall be notified of the timing, location, and duration of construction activities during the project implementation.

Mitigation Measure 3.9.3b: Zone 7 shall not restrict access to emergency facilities. Zone 7 shall coordinate with fire station personnel to maintain required 24-hour access to fire stations within the project vicinity. To avoid blocking access to emergency medical facilities, Zone 7 and its contractors shall schedule work on project sites such that multiple access points to the medical center are not blocked simultaneously.

Mitigation Measure 3.9.3c: Zone 7 shall provide, upon request, a copy of the traffic control plan to the sheriff's department, local police departments, county fire department, and local fire departments for their review prior to construction.

Mitigation Measure 3.9.3d: Zone 7 shall temporarily detour bicycle paths around the construction zone or to other streets to ensure that no new safety hazards result from implementation of the project.

Mitigation Measure 3.9.3e: Zone 7 shall require a minimum of 72-hour advance notice of access restrictions to the residents and businesses. Affected residents and businesses would be advised when to move motor vehicles out of the area to be closed. Notification and other requirements stipulated in the encroachment permit shall be incorporated into the traffic control plan.

Impact Significance after Mitigation: Less than significant.

Impact 3.9.4. Wear-and-Tear On Haul Routes: Construction of individual SMMP projects could increase wear-and-tear on the designated haul routes used by construction vehicles to access the project sites. Less than Significant with Mitigation.

Use of big trucks to transport equipment and material to and from the project sites could affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur depends on the design (pavement type and thickness) and the existing condition of the road. Major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks. The project's impacts are expected to be negligible on those roads.

Residential streets are generally not built with a pavement thickness that will withstand substantial truck traffic volumes. Therefore, if residential streets are frequently used, then potential roadwear may occur. This could be significant impact. Residential streets are located within the project area throughout the cities of Pleasanton, Livermore, and Dublin. Implementation of **Mitigation Measure 3.9.4a** would reduce potential impacts to less-than-significant levels by implementing a rehabilitation program.

Mitigation Measures

Mitigation Measure 3.9.4a: If required by the encroachment permit, Zone 7 shall prepare a videotape of road conditions for the routes to be used by project-related vehicles. Zone 7 shall prepare a similar videotape of road conditions after project construction is completed. The pre- and post-construction conditions of the haul routes shall be reviewed by staff of the local Public Works Department. Zone 7 shall enter into an agreement prior to construction that provides details on the pre-construction conditions and post-construction requirements of the rehabilitation program.

Impact Significance after Mitigation: Less than significant.

Long-term Operational Impacts

Impact 3.9.5. Long-term Traffic: Long-term operational trips associated with the SMMP would be limited to those needed to perform inspection and maintenance activities. It is anticipated that these activities would likely generate fewer trips than project construction. Traffic on area roadways serving the project locations would increase negligibly as a result of long-term maintenance. Less than Significant with Mitigation.

As required under the traffic control plan (see **Mitigation Measure 3.9.1a**), weekday construction would be limited to non peak hours. Depending upon the reach and project site, the operational trips would be temporary, intermittent, dispersed throughout the work day, and dispersed geographically. As construction-generated traffic would be temporary, the proposed project would not result in the long-term degradation of roadway conditions or LOS on project roadways. Potential impacts associated with project-related traffic congestion would be reduced to less-than-significant levels with implementation of **Mitigation Measure 3.9.1a**.

Mitigation Measures

Implement **Mitigation Measure 3.9.1a.**

Impact Significance after Mitigation: Less than Significant.

**TABLE 3.9-2
SUMMARY OF TRAFFIC IMPACTS BY PROJECT**

Reach/Project	Construction Impacts				Long-term Operational Impact
	Impact 3.9.1 Short-term Traffic	Impact 3.9.2 Transit Service Disruption	Impact 3.9.3 Adjacent Land Use Access	Impact 3.9.4 Wear-and-Tear On Haul Routes	Impact 3.9.5 Long-term Traffic
Reach 1					
R.1-1	LSM	LSM	LSM	LSM	LSM
R.1-2	LSM	LSM	LSM	LSM	LSM
R.1-3	LSM	LSM	LSM	LSM	LSM
R.1-4	LSM	LSM	LSM	LSM	LSM
R.1-5	LSM	LSM	LSM	LSM	LSM
R.1-6	LSM	LSM	LSM	LSM	LSM
R.1-7	LSM	LSM	LSM	LSM	LSM
Reach 2					
R.2-1	LSM	LSM	LSM	LSM	LSM
R.2-2	LSM	LSM	LSM	LSM	LSM
R.2-3	LSM	LSM	LSM	LSM	LSM
Reach 3					
R.3-1	LSM	LSM	LSM	LSM	LSM
R.3-2	LSM	LSM	LSM	LSM	LSM
R.3-3	LSM	LSM	LSM	LSM	LSM
R.3-4	LSM	LSM	LSM	LSM	LSM
R.3-5	LSM	LSM	LSM	LSM	LSM
Reach 4					
R.4-1	LSM	LSM	LSM	LSM	LSM
R.4-2	LSM	LSM	LSM	LSM	LSM
Reach 5					
R.5-1	LSM	LSM	LSM	LSM	LSM
R.5-2	LSM	LSM	LSM	LSM	LSM
R.5-3	LSM	LSM	LSM	LSM	LSM
Reach 6					
R.6-1	LSM	LSM	LSM	LSM	LSM
R.6-2	LSM	LSM	LSM	LSM	LSM
Reach 7					
R.7-1	LSM	LSM	LSM	LSM	LSM
R.7-2	LSM	LSM	LSM	LSM	LSM
R.7-3	LSM	LSM	LSM	LSM	LSM
Reach 8					
R.8-1	LSM	LSM	LSM	LSM	LSM
R.8-2	LSM	LSM	LSM	LSM	LSM
R.8-3	LSM	LSM	LSM	LSM	LSM
R.8-4	LSM	LSM	LSM	LSM	LSM
Reach 9					
R.9-1	LSM	LSM	LSM	LSM	LSM
R.9-2	LSM	LSM	LSM	LSM	LSM
R.9-3	LSM	LSM	LSM	LSM	LSM
R.9-4	LSM	LSM	LSM	LSM	LSM
R.9-5	LSM	LSM	LSM	LSM	LSM
R.9-6	LSM	LSM	LSM	LSM	LSM
R.9-7	LSM	LSM	LSM	LSM	LSM
Reach 10					
R.10-1	LSM	LSM	LSM	LSM	LSM
R.10-2	LSM	LSM	LSM	LSM	LSM
R.10-3	LSM	LSM	LSM	LSM	LSM
R.10-4	LSM	LSM	LSM	LSM	LSM
R.10-5	LSM	LSM	LSM	LSM	LSM

**TABLE 3.9-2 (continued)
SUMMARY OF TRAFFIC IMPACTS BY PROJECT**

Reach/Project	Construction Impacts				Long-term Operational Impact
	Impact 3.9.1 Short-term Traffic	Impact 3.9.2 Transit Service Disruption	Impact 3.9.3 Adjacent Land Use Access	Impact 3.9.4 Wear-and-Tear On Haul Routes	Impact 3.9.5 Long-term Traffic
Reach 11					
R.11-1	LSM	LSM	LSM	LSM	LSM
R.11-2	LSM	LSM	LSM	LSM	LSM
Reach 12					
R.12-1	LSM	LSM	LSM	LSM	LSM
R.12-2	LSM	LSM	LSM	LSM	LSM

SU = Significant and Unavoidable
S = Significant
PS = Potentially Significant
LSM = Less than Significant with Mitigation
LTS = Less than Significant
N = No Impact

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3.10 Hazardous Materials

3.10.1 Setting

Regional Setting

Hazardous Materials

Hazardous materials are substances with certain physical or chemical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed of, or otherwise managed. Title 22 of the California Code of Regulations, Division 4.5, Chapter 11, Article 3 groups hazardous materials into the following four categories based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), and reactive (causes explosions or generates toxic gases). Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications as well as in residential areas to a limited extent.

According to California Health and Safety Code, Section 25141, hazardous waste is any waste that may (1) cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness, or (2) pose a substantial present or potential hazard to human health or the environment due to factors including, but not limited to, carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties, or persistence in the environment, when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous materials and wastes released to soil, groundwater, or air can result in public health hazards.

Hazardous wastes sites are permitted under the Resource Conservation and Recovery Act (RCRA) and other regulatory legislation to handle hazardous substances. Presence of these substances does not necessarily indicate that the site is contaminated. The regulatory agencies maintain databases of hazardous waste sites where contamination is either suspected or has been confirmed by the regulatory agencies. The presence of hazardous substances in the soil and/or groundwater at or near a project location increases the potential to encounter hazardous substances during construction and potentially after development. The presence of hazardous substances may also require special construction and/or waste handling procedures. A search of databases performed for this project identified both potential and confirmed hazardous waste sites. Confirmed hazardous waste sites located within each reach are listed in **Appendix 3.10-1**. Sites that have been closed by the lead agency or have a low degree of soil contamination are not listed.

One of the pollutants identified in most of the Zone 7's streams and in most streams located in urbanized areas of the central San Francisco Bay region is diazinon. Diazinon has been one of the most widely used insecticides in the U.S. for household as well as agricultural pest control, but is now being phased out of household use.¹ In addition to diazinon, the San Francisco Bay Regional

¹ To reduce risks to children and others, the U.S. Environmental Protection Agency is phasing out and canceling all residential uses. All indoor residential use product registrations were canceled and retail sale of these products ended as of December 31, 2002. Outdoor residential use product registrations and retail sale must have ended as of December 31, 2004. (http://www.epa.gov/REDs/factsheets/diazinon_ired_fs.htm)

Water Quality Board has identified other general pollutants of concern such as mercury, copper, selenium, dioxins, polychloro biphenyls (PCBs), and other pesticides for the streams in the central San Francisco Bay Area including those in the SMMP project area.

3.10.2 Regulatory Framework

The policies and regulations associated with impacts from hazardous materials within the affected jurisdictions are presented in **Appendix 3.10** of this EIR.

Hazardous Materials Business Plan

Zone 7 Hazardous Materials Business Plan specifies the following emergency response procedures to be implemented in the event of a chemical emergency:

- Immediately report a fire, spill, release or threatened release of hazardous materials or hazardous waste to the facility supervisor during normal working hours or to the Zone 7 Telephone Radio Operator (TRO) during off hours. If emergency assistance is required, the initial observer or supervisor will call 911.
- The supervisor, TRO, and/or on-site personnel will notify appropriate Zone 7 personnel or regulatory agencies and/or initiate site-specific response plans or procedures, as appropriate.
- Concurrent with notification, trained personnel or outside contractors will begin cleanup and/or containment of the spill or release as soon as it is safe to do so.
- Should evacuation be necessary, the facility supervisor or incident commander will direct personnel to evacuate the facility. Upon notification, all employees will immediately secure their area and proceed to the assembly area prescribed by the evacuation plan map.
- In the event of an earthquake, conflagration, flood or other major emergency, the evacuation and response plans will be invoked.
- In the event an employee experiences a serious chemical exposure, illness, or injury, 911 is called and the victim will be transported to the nearest hospital or treated as determined by the paramedics responding to the call. For lesser exposures, any affected employee will be transported to a local medical facility in accordance with Zone 7 procedures.

3.10.3 Hazardous Materials Impacts and Mitigation Measures

Significance Criteria

In accordance with the CEQA Guidelines and agency and professional standards, the proposed project would be considered to cause a significant impact if it would create a potential public health hazard or involve the use, production, or disposal of materials that pose a hazard to people, or animal or plant populations, in the area affected.

Impacts and Mitigation Measures

Implementation of the proposed SMMP would include construction projects related to flood control and stream management within the Zone 7 service area. The SMMP proposes the construction of sediment basins, new channels, trails, a classroom education center and kiosks; as well as channel, corridor, and bridge improvements. Construction or demolition activities associated with the SMMP could expose people and/or structures to hazardous materials such as lead or asbestos.

For the purpose of hazardous materials impacts discussion, the SMMP projects are discussed as a part of two categories: in-stream and out-of-stream construction projects. In-stream construction activities include sediment basin construction, channels widening, and bank stabilization. Such projects would involve extensive excavation but limited amount of construction-related hazardous materials. Out-of-stream activities such as construction of an education/classroom structure, wetland creation, and habitat pond construction would require comparatively less excavation, however would involve greater use of chemicals or construction-related hazardous materials, which would create a higher risk of accidental release and thus a hazard to the environment and human health. Also, depending on the site conditions, vegetation management and invasive species control techniques may require use of herbicides for selective spraying on target species. Herbicide application would be conducted in the channel, along the channel banks, on levees, and on unpaved roads. If application is to occur on the streambed or within the channel banks, herbicides and surfactants registered for aquatic use would be selected. Annual treatment may be necessary, however, the treatment would be limited since herbicides could not be broadcast across the channel but would be instead sprayed at plants targeted for removal. Herbicides used would be in accordance with the U.S. Environmental Protection Agency, the California Department of Pesticide Regulation, and the County Agricultural Commission.

Construction Impacts

Impact 3.10.1. Exposure To Hazardous Materials: Project construction activities would involve use of chemicals such as fuels and other hazardous materials. Such activities result of an accidental spill such materials and could expose workers and/or the public to hazardous materials. Less than Significant with Mitigation.

Construction activities under the proposed SMMP would involve use of chemicals and hazardous materials such as fuel, oil, and solvents that would be handled directly or would be used for mechanized equipment. Excavation equipment, generators, and other construction equipment materials could also be stored at the construction sites, particularly in the case of out-of-stream projects. If not properly managed, on-site fueling of equipment or an upset condition (i.e., puncture of a fuel tank through operator error or slope instability) could result in the release of fuel or oil, which could flow into the closest receiving water body. This would cause a potentially significant impact to the receiving waters as well as pose a hazard to the workers, public, and the environment. This impact would be minimized to a less-than-significant level by implementation of **Mitigation Measure 3.10.1a.**

Mitigation Measures

Mitigation Measure 3.10.1a: The following hazardous materials management, spill prevention, and spill response/cleanup shall be included in contractor specifications for each project site:

- Prepare a construction site plan, including delineation of hazardous material and hazardous waste storage areas, access and egress routes, drainage paths, emergency assembly areas, and temporary hazardous waste storage areas.
- Provide Materials Safety Data Sheets for all chemicals used and stored at the project site.
- Implement spill control and countermeasures, including employee spill prevention/response training.
- Prepare an inventory list of emergency equipment.
- Provide off-loading, safety, and handling procedures for each chemical.
- Provide notification and documentation procedures.

Impact Significance after Mitigation: Less than significant.

Impact 3.10.2. Contaminated Soil and Groundwater: Construction of in-stream and out-of-stream projects could disturb contaminated soils or groundwater. This could increase the potential of exposure of public and the environment to hazardous materials. Less than Significant with Mitigation.

The potential for encountering hazardous materials during construction has been assessed on the basis of a search of federal and state databases, including the Geotracker database and Cortese List that identify potential hazardous waste sites within each of the reaches (see **Table A.3.10-1 Appendix 3.10-1**). As the table indicates hazardous waste sites are located in all the reaches of the SMMP project area. Therefore, there is a possibility that construction activities such as excavation within the SMMP project area would disturb existing contaminated soil or groundwater.

Contaminated soil would likely be identified in the field either visually or by the detection of odors. As part of the due diligence in reviewing individual project sites, Zone 7 would review site history with respect to hazardous materials contamination. However, there is a possibility of an accidental discovery of unknown contaminated soil or groundwater, either while maintaining or constructing facilities. The contaminated materials may be classified as a hazardous waste, a designated waste, or a special waste, depending on the type and degree of contamination. Disposal of contaminated soils as standard demolition waste or use as fill for another construction site could pose a hazard to people, or animals, or plant populations. This would be a significant impact. Implementation of **Mitigation Measure 3.10.2a** would reduce this impact to a less-than-significant level. **Table 3.10-1** summarizes the impact conclusion for project construction related impacts.

Mitigation Measures

Measure 3.10.2a: Unanticipated contaminated soils may be discovered during construction or well drilling. The following procedures shall be included in contractor specifications, in the event that noxious odors, discolored soil, or other indications of gross contamination are identified:

- Stop work in areas of contact.
- If necessary, call responsible agencies. Typically, the Alameda County Health Care Services Agency and/or the Department of Environmental Health would be the responsible agencies. The San Francisco Bay RWQCB could become involved if the groundwater or surface water is contaminated, and the California Department of Toxic Substances Control could become involved if soils are contaminated.
- Fence off areas of contamination.
- Perform appropriate clean up procedures, i.e., any contaminated soils would be segregated, profiled, and appropriately disposed of at an offsite location. The disposal method would depend on the types and concentrations of contaminants identified in the soil. Any site investigations or remediations would be performed in accordance with applicable laws.

Impact Significance after Mitigation: Less than significant.

**TABLE 3.10-1
SUMMARY OF HAZARDOUS MATERIALS IMPACTS BY PROJECT**

Reach/Project	Construction Impacts	
	Impact 3.10.1 Exposure To Hazardous Materials	Impact 3.10.2 Contaminated Soil and Groundwater
Reach 1		
R.1-1	LSM	LSM
R.1-2	LSM	LSM
R.1-3	LSM	LSM
R.1-4	LSM	LSM
R.1-5	LSM	LSM
R.1-6	LSM	LSM
R.1-7	LSM	LSM
Reach 2		
R.2-1	LSM	LSM
R.2-2	LSM	LSM
R.2-3	LSM	LSM
Reach 3		
R.3-1	LSM	LSM
R.3-2	LSM	LSM
R.3-3	LSM	LSM
R.3-4	LSM	LSM
R.3-5	LSM	LSM
Reach 4		
R.4-1	LSM	LSM
R.4-2	LSM	LSM
Reach 5		
R.5-1	LSM	LSM
R.5-2	LSM	LSM
R.5-3	LSM	LSM
Reach 6		
R.6-1	LSM	LSM
R.6-2	LSM	LSM
Reach 7		
R.7-1	LSM	LSM
R.7-2	LSM	LSM
R.7-3	LSM	LSM
Reach 8		
R.8-1	LSM	LSM
R.8-2	LSM	LSM
R.8-3	LSM	LSM
R.8-4	LSM	LSM
Reach 9		
R.9-1	LSM	LSM
R.9-2	LSM	LSM
R.9-3	LSM	LSM
R.9-4	LSM	LSM
R.9-5	LSM	LSM
R.9-6	LSM	LSM
R.9-7	LSM	LSM
Reach 10		
R.10-1	LSM	LSM
R.10-2	LSM	LSM
R.10-3	LSM	LSM
R.10-4	LSM	LSM
R.10-5	LSM	LSM

TABLE 3.10-1 (continued)
SUMMARY OF HAZARDOUS MATERIALS IMPACTS BY PROJECT

Reach/Project	Construction Impacts	
	Impact 3.10.1 Exposure To Hazardous Materials	Impact 3.10.2 Contaminated Soil and Groundwater
Reach 11		
R.11-1	LSM	LSM
R.11-2	LSM	LSM
Reach 12		
R.12-1	LSM	LSM
R.12-2	LSM	LSM

SU = Significant and Unavoidable
S = Significant
PS = Potentially Significant
LSM = Less than Significant with Mitigation
LTS = Less than Significant
N = No Impact

References – Hazardous Materials

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3.11 Public Services and Utilities

3.11.1 Setting

Existing Environment

Providers of utilities and services in the four jurisdictions applicable to the SMMP project area are discussed below.

City of Pleasanton

Emergency Service Providers

The Pleasanton Police Department provides law enforcement services within Pleasanton city limits. The police station is located at 4833 Bernal Avenue. The Livermore-Pleasanton Fire Department provides fire protection and fire-fighting services within city limits for both Pleasanton and Livermore. American Medical Response has a 911 contract with selected areas of Alameda County, including Pleasanton, Dublin, and Livermore, and individual hospitals (LAVWMA, 1997).

Water Facilities

Zone 7 wholesales water to the City of Pleasanton, which in turn provides water service within Pleasanton city limits. Water mains are generally present on city streets. Groundwater wells are located throughout the Livermore-Amador Valley. The wells are maintained both by Zone 7 and the City of Pleasanton Public Works Department.

Wastewater Collection

Dublin-San Ramon Services District (DSRSD) provides treatment services to the City of Pleasanton. Sewer trunk lines and laterals are generally present within city streets.

Storm Drains

The City of Pleasanton maintains storm drains within city limits, with storm drains generally present within city streets.

Other Utilities

Telephone lines exist in the project area and are maintained by SBC and AT&T. Pacific Gas and Electric (PG&E) maintains gas and electric lines in Pleasanton. Underground cable line, fiber optic cable lines, and petroleum pipelines may also be present throughout the City of Pleasanton.

Schools and Parks

School services within the City of Pleasanton are provided by the Pleasanton Unified School District. All schools in the Pleasanton Unified School District are within the SMMP project area.

The City of Pleasanton maintains parks within city limits. **Section 3.4, Land Use**, identifies schools and parks within the project area in Pleasanton, a number of which are located within the western SMMP reaches.

City of Livermore

Emergency Service Providers

The Livermore Police Department provides law enforcement services within the Livermore city limits and operates one police station, located at 1110 South Livermore Road. The Livermore-Pleasanton Fire Department provides fire protection and fire-fighting services within the city limits of both Livermore and Pleasanton. American Medical Response has a 911 contract with selected areas of Alameda County, including Pleasanton and Livermore as well as with individual hospitals (LAVWMA, 1997).

Water Facilities

Zone 7 wholesales water to city of Livermore and California Water Service Company (CWS), which in turn provides water supply to its customers within the majority of the Livermore city limits. Water mains are generally present within city streets.

Wastewater Collection

Livermore Water Reclamation Plant provides wastewater collection and treatment services within the city limits. Sewer trunk lines and laterals are generally present within area roadways.

Storm Drains

The City of Livermore maintains storm drains within city limits. Storm drains are generally located within area roadways.

Other Utilities

SBC and PG&E are some of the utility providers in Livermore with utilities generally located within area roadways.

Schools and Parks

School services within the City of Livermore are provided by the Livermore Valley Joint Unified School District. All schools in the Livermore Valley Joint Unified School are within the SMMP project area.

The East Bay Regional Park District (EBRPD) and the Livermore Area Recreation and Park District maintain parks and open space within city limits.

City of Dublin

Emergency Service Providers

Law enforcement services in the City of Dublin are provided under contract by Alameda County Sheriff's Office. The Dublin Police Services business office located at 100 Civic Center Plaza in Dublin is the base of operations for patrol, criminal investigation, crime prevention, and business. Fire services in the city of Dublin are provided under contract by Alameda County Fire Department, which maintains three stations in Dublin at 7494 Donahue Drive, 6200 Madigan Avenue, and 4800 Fallon Road. In addition to fire suppression, the contract with Alameda County Fire Department covers first responder/paramedic services and all necessary fire and emergency medical support services (City of Dublin, 2004).

Water Facilities

Zone 7 wholesales water to DSRSD, which in turn provide water to their customers within Dublin city limits. Water mains are generally present within city streets.

Wastewater Collection

Wastewater service is provided to the City of Dublin by DSRSD, through a contract with the [Livermore-Amador Valley Water Management Agency \(LAVWMA\)](#), a joint powers agency between the cities of Livermore and Pleasanton and the DSRSD. A pipeline conveys wastewater from Pleasanton to San Leandro where it enters the East Bay Dischargers Authority system for dechlorination and discharges through a deepwater outfall to San Francisco Bay. Sewer trunk lines and laterals are generally present within area roadways.

Storm Drains

The City of Dublin maintains storm drains within city limits, which are generally located within area roadways. The City has a Watercourse Ordinance that regulates construction around natural and manmade watercourses.

Other Utilities

SBC and PG&E are some of the utility providers in Dublin and utilities are generally located within area roadways.

Schools and Parks

School services within the City of Dublin are provided by the Dublin Unified School District. All schools in the Dublin Unified School are within the SMMP project area.

City of Dublin Parks and Community Services Department maintain parks and open space within city limits.

Unincorporated Alameda County

Emergency Service Providers

The Alameda County Sheriff's Department provides law enforcement services to unincorporated Alameda County. The Alameda County Fire Department provides fire services and emergency medical response to this area.

Water Supply

There is limited development within the unincorporated areas of Alameda County. The predominant use within this area is mining and agricultural operations. Water is provided to this area by Zone 7 through turnouts and pipelines.

Wastewater Collection

Given the limited development within this area wastewater is conveyed to one of the wastewater treatment plants in the area (the DSRSD and the Livermore Water Reclamation Plant), or treated through individual septic systems.

Storm Drains

One storm drain in the project area for R.6-2 is located in Unincorporated Alameda County. There are no other storm drain facilities within this area. Stormwater is managed within the existing flood control channels, in particular, Arroyo Mocho.

Other Utilities

SBC, AT&T, PG&E, MCI, and Viacom provide most of the other types of utilities in this portion of unincorporated Alameda County.

Schools and Parks

There are no schools in this part of unincorporated Alameda County. Shadow Cliffs Regional Recreation Area, managed by the EBRPD is located south of Stanley Boulevard. Various trail facilities, managed by EBRPD, are located throughout the Service area.

3.11.2 Regulatory Framework

The policies and regulations associated with impacts to utilities and services within the affected jurisdictions are presented in **Appendix 3.11** of this EIR.

3.11.3 Public Services and Utilities Impacts and Mitigation Measures

Significance Criteria

Under CEQA, a project would normally have a significant adverse impact on public services or utilities if it would breach published, national, state, or local standards relating to solid waste, contaminate a public water supply, interfere with emergency services, extend a sewer trunk line

with capacity to serve new development, or interfere with emergency response plans or emergency evacuation plans. For the purposes of this EIR, if the project would breach any of the above-referenced standards, or disrupt utilities service to create a public health hazard or extended service disruption, it would be considered to have a significant impact on the environment.

Impacts and Mitigation measures

Construction Impacts

Impact 3.11.1. Utility Service Disruption: Construction of individual SMMP projects could result in temporary, planned, or accidental disruption of utility services. Less than Significant with Mitigation.

Temporary utility disruptions due to the construction of SMMP projects would be more likely in reaches located in the cities of Livermore, Dublin and Pleasanton. These areas are more urbanized and have a higher level of utility services and therefore more infrastructure. Temporary utility disruptions may include disruption of water, electrical, gas or telecommunications service. Utility lines generally run underground in road right-of-ways. Therefore, projects with the highest likelihood of causing disruptions to utilities are those in the vicinity of road right-of-ways. Disruption may be caused accidentally during trenching activities. Lines may be cut and/or may need repair. Additionally, projects may necessitate intentional cutting of utility lines. Projects that would have higher potential for temporary utility disruptions include Project R.2-2 Arroyo Seco Improvements and R.7-1 Upper Chain of Lakes Trail Network. These projects and others like them include bridge work, trail work, and installation of street lights. These types of activities occurring in existing right-of-ways have the highest potential to disrupt utility lines. Additionally, the in-stream nature of several SMMP projects could result in disruption to water delivery systems. The South Bay Aqueduct (SBA) Turnout project on Arroyo Mocho in Reach 3 (Project R.3-1) could result in disruption of the SBA water delivery system. Projects occurring in the vicinity of utility lines could potentially necessitate permanent relocation of utility lines. This could be a significant impact. Due to the limited amount of work expected to occur in areas that are already overcrowded with utilities, it is unlikely that relocation would be needed. Implementation of **Mitigation Measures 3.11.1a and 3.11.1b** would reduce potential impacts to less than significant.

Mitigation Measures

Mitigation Measure 3.11.1a: For SMMP projects located within urban/suburban areas, the following mitigation measures are identified:

- Utility excavation or encroachment permits shall be required from the appropriate agencies. These permits include measures to minimize utility disruption. Zone 7 and its contractors shall comply with permit conditions and such conditions shall be included in construction contract specifications.
- Utility locations shall be verified through field surveys (potholing) and use of the Underground Service Alert services.

- Detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services shall be notified of Zone 7's construction plans and schedule. Arrangements shall be made with these entities regarding protection, relocation, or temporary disconnection of services.
- Zone 7 shall employ special construction techniques in areas where excavation activities would parallel wastewater mains. These special measures, which should be included in the engineering specifications, shall include trench wall-support measures to guard against trench wall failure and possible resulting loss of structural support for the water main.
- Residents and businesses in the project area shall be notified of planned utility service disruption two to four days in advance, in conformance with county and state standards.

Mitigation Measure 3.11.1b: Consistent with its current operational practices, Zone 7 shall coordinate construction activities and delivery outage schedules with Zone 7 contractors and other affected agencies, as appropriate.

Impact Significance after Mitigation: Less than significant.

Impact 3.11.2. Police and Fire Protection Services: Construction activities for all facilities could require short-term police and fire protection services to assist in traffic management or in the event of an accident. Less than Significant with Mitigation.

During construction, project-related hazards include traffic congestion, detours at bridges, and operation of heavy construction equipment. Construction activities could also result in interference with high-pressure gas lines and other high-voltage lines. Increased services required could include emergency response in the event of an accident and additional police service needed due to traffic-delaying construction. Such activities could require response from fire units, but would be within the context of public service demands within the Livermore Valley. Although the impacts to public services would occur predominantly during construction, which would be temporary and short-term, the impact could be significant. Implementation of mitigation would reduce the impact to less than significant.

Mitigation Measures

Measure 3.11.2a: Zone 7 or its contractors shall provide, upon request, a copy of the Traffic Control Plan to the County sheriff's department, local police departments, County fire department, and local fire departments for their review prior to construction. Zone 7 shall provide 72-hour notice to the local service providers prior to construction of individual pipeline segments. Discussion on the Traffic Control Plan is provided in **Section 3.9, Traffic and Circulation**, under **Mitigation Measure 3.9.1b**.

Impact Significance after Mitigation: Less than significant.

Long-term Operational Impacts

Impact 3.11.3. Police and Fire Protection Services: Implementation of individual SMMP projects could increase demands on to police or fire protection services. Less than Significant.

The majority of SMMP projects are focused on stream management and would not generate the need for additional police or fire protection services. However, recreational projects included in the SMMP may require additional services. These mainly consist of trails construction. The considerable amount of trails proposed by the SMMP could increase the need for response to emergencies, missing persons, fires and other recreation related circumstances. Trails projects are proposed in Reaches 1 through 11. The education center/in-door classroom component of Project R.3-2 could require emergency services however, this component would be located at an existing City of Livermore facility, Robertson Park, and no increase in demand for police or fire services is anticipated. Because development of trails within the SMMP project area would occur in areas already served by fire and police, potential impacts are considered less than significant. No mitigation measures would be required.

**TABLE 3.11-1
SUMMARY OF PUBLIC SERVICES AND UTILITIES IMPACTS BY PROJECT**

Reach/ Project	Construction Impacts		Long-term Operational Impacts
	Impact 3.11.1 Utility Service Disruption	Impact 3.11.2 Police and Fire Protection Services	Impact 3.11.3 Police and Fire Protection Services
Reach 1			
R.1-1	LSM	LTS	LTS
R.1-2	LTS	LTS	LTS
R.1-3	LSM	LTS	LTS
R.1-4	LSM	LTS	LTS
R.1-5	LSM	LTS	LTS
R.1-6	LSM	LTS	LTS
R.1-7	LSM	LTS	LTS
Reach 2			
R.2-1	LSM	LTS	LTS
R.2-2	LSM	LTS	LTS
R.2-3	LSM	LTS	LTS
Reach 3			
R.3-1	LSM	LTS	LTS
R.3-2	LSM	LTS	LTS
R.3-3	LSM	LTS	LTS
R.3-4	LSM	LTS	LTS
R.3-5	LSM	LTS	LTS
Reach 4			
R.4-1	LTS	LTS	LTS
R.4-2	LSM	LTS	LTS
Reach 5			
R.5-1	LSM	LTS	LTS
R.5-2	LSM	LTS	LTS
R.5-3	LSM	LTS	LTS
Reach 6			
R.6-1	LSM	LTS	LTS
R.6-2	LTS	LTS	LTS
Reach 7			
R.7-1	LSM	LTS	LTS
R.7-2	LSM	LTS	LTS
R.7-3	LSM	LTS	LTS
Reach 8			
R.8-1	LSM	LTS	LTS
R.8-2	LSM	LTS	LTS
R.8-3	LTS	LTS	LTS
R.8-4	LSM	LTS	LTS
Reach 9			
R.9-1	LTS	LTS	LTS
R.9-2	LTS	LTS	LTS
R.9-3	LSM	LTS	LTS
R.9-4	LSM	LTS	LTS
R.9-5	LSM	LTS	LTS
R.9-6	LTS	LTS	LTS
R.9-7	LSM	LTS	LTS
Reach 10			
R.10-1	LSM	LTS	LTS
R.10-2	LSM	LTS	LTS
R.10-3	LSM	LTS	LTS
R.10-4	LSM	LTS	LTS
R.10-5	LSM	LTS	LTS

TABLE 3.11-1 (continued)
SUMMARY OF PUBLIC SERVICES AND UTILITIES IMPACTS BY PROJECT

Reach/ Project	Construction Impacts		Long-term Operational Impacts
	Impact 3.11.1 Utility Service Disruption	Impact 3.11.2 Police and Fire Protection Services	Impact 3.11.3 Police and Fire Protection Services
Reach 11			
R.11-1	LSM	LTS	LTS
R.11-2	LTS	LTS	LTS
Reach 12			
R.12-1	LTS	LTS	LTS
R.12-2	LTS	LTS	LTS

LSM = Less than Significant with Mitigation

LTS = Less than Significant

N= No Impact

n/a = not applicable

References – Public Services and Utilities

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3.12 Cultural Resources

3.12.1 Setting

Regional Setting

Cultural resources include, but are not limited to, any object, building, structure, site, area, place, record, or manuscript that is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. Numerous prehistoric archaeological sites have been identified in a variety of environments within the SMMP project area and the Bay Area as a whole, including at or near former or existing wetlands boundaries, along seasonal and perennial watercourses and other sources of fresh water such as springs, at the base of foothills, at or near vegetation ecotones, and buried by alluvial deposits.

Prehistoric Context

The natural marshland biotic communities along the edges of bays and channels were the principal source for subsistence and other activities during most of the Holocene¹ period in the San Francisco Bay region. Many of the original surveys of archaeological sites in the Bay region were conducted between 1906 and 1908 by N.C. Nelson, which yielded the initial documentation of nearly 425 “earth mounds and shell heaps” along the littoral zone of the Bay (Nelson, 1907). From these beginnings, the most notable sites in the Bay region were excavated scientifically, like the Emeryville shellmound (numbered as Ala-309), the Ellis Landing Site (Cco-295) in Richmond, and the Fernandez Site (CC0-259) in Rodeo Valley (Morrato, 1984). These dense midden sites are vast accumulations of domestic debris, which have been carbon 14 dated to be 2310 ± 220 years old, such as Ala-309, but other evidence from around the Bay suggests that human occupation in the region is of greater antiquity, or ± 5000 B.C. (Davis & Treganza, 1959). While many interpretations exist as to the function of the shellmounds, much of the evidence suggests that they served as sociopolitical landmarks on the cultural landscape and may have served as ceremonial features as well.

Early urbanization of the Bay Area and massive amounts of filling along the bayshores has, in many cases, destroyed or at least obscured the archaeological record. Indeed, much of the subsequent excavation work has been done after Nelson’s (1907) investigations have been salvage operations (Gerow, 1968; Schenk, 1926). Some of the evidence for initial human occupation of the area is represented by what are commonly referred to as the Civic Center BART and Sunnyvale skeletons (Moratto, 1984). We now know that these date to just 5,000 years ago. Sea-level changes and post-Gold Rush sedimentation have obscured older materials. Recent evidence indicates that the lowest level strata of several of the oldest bay mounds are now 6 meters (m) below sea level, while virtually all other major estuarine environments along the California coast yield significant archaeological materials older than 5,000 years (Broughton, 1999; Jones 1992). Thus although the earliest known bay shore mounds

¹ 10,000 years ago to present day.

date to 3,800 years ago, it is difficult to generalize about the time frame in view of the obvious sample bias. The majority of the earliest bay area sites are well inland along the inland lakes and estuaries (e.g., Fitzgerald, 1993; Jones, 1991). Perhaps for this reason, the Early period (c. 3,000–500 BC) is generally characterized as having less emphasis on shellfish than the later midden sites and instead was focused on hunting and vegetal food processing, or terrestrial subsistence.

The Early Period or the so-called “Berkeley Pattern” is characterized by almost exclusive use of cobble mortars and pestles, which is often associated with a heavy reliance on acorns in the economy (Fredrickson, 1973). Such unusually intensive reliance on one food item indicates that a change in the earlier pattern of reliance on a broad spectrum of dietary sources to supply demand was needed by around 1,000 before present (B.P.). The Late Pleistocene/Early Holocene profusion of food availability along lakeshores and estuaries likely led to an overexploitation of the resources that led, initially, to population increases, which may explicate the shift toward exploiting a readily available, yet lower ranked resource like acorns or seeds (Jones, 1991). Nevertheless, given the burgeoning size of Early Period settlements, it is probable that the populations were denser and more sedentary, yet continued to exploit a diverse resource base—from woodland to grassland and marshland, to bayshore resources throughout the San Francisco Bay Area (Bickel, 1978; King, 1974). Many of the Berkeley traits diffused throughout the region and spread to the interior areas of central California during this time period.

The population increases and larger, more complex settlements that began in the late-Early Period typify the Middle Period (ca. 500 BC – AD 1,000), which is sometimes referred to as the “golden age” of shellmound communities (Arnold et al., 2004). The sociopolitical landscape also appears to become more elaborate with clear differentiations in wealth and evidence of aggrandizing. During the Late Period (ca. AD 1,000 – 1,700), however, new sites start to decline in the record and the large shellmounds were abandoned. The Late Period also showed population declines and concomitant changes in resource use—likely due to human-caused depletions in some terrestrial food sources during the Middle Period (Simons, 1992). Broughton (1994; 1999) determined that vertebrate fauna discovered in the Emeryville shellmound showed clear changes in the Middle Period from preferred terrestrial species to expensive (or less efficiently pursued prey per unit of energy) marine mammals, and significant changes in body size in both terrestrial and marine animals, which suggests overexploitation.

While the Bay shellmounds tended to dominate East Bay archaeology, a number of important sites have been investigated in the interior valleys of Alameda County. For example, the Santa Rita Village site, CA-Ala-413, in Pleasanton, yielded data on numerous artifacts, burials, and ecofactual plant and animal remains. The site also represented two stratigraphic components, indicating a long history of occupation from 400 B.C. to A.D. 100 (Chavez, 1994). Moreover, the later component revealed evidence of technological influence diffused from the Delta region.

Within the Alameda Creek riparian corridor is the Sunol Regional Wilderness Area Site, CA-Ala-428H. The site consists of a midden deposit and associated bedrock mortars. Obsidian hydration dates the site occupation from 343 B.C. to A.D. 1730 (Leventhal et al., 1989 as cited in Chavez, 1994).

Ethnographic Setting

At the time of historical contact (ca. 1775), the SMMP project area was inhabited by Ohlone populations, known to the Spanish as “Costenos” meaning “coast people”. Ethnographic accounts defined the Ohlone territory from the southern coastal region of San Francisco Bay to Monterey (Levy, 1978; Margolin, 1978). The Ohlone of the San Francisco Bay Area was not a homogenous tribe or a single nation; rather, the ethnic groups recognized within the overarching Ohlone culture were sets of independent tribelets that spoke a common language—each neighboring tribe presenting slight dialect variations—and lived in a circumscribed, contiguous area. Despite having a common language base, the various tribelets were not bound together in any political sense. The tribelet served as the basis of sociopolitical organization and kinship reckoning. Indeed, the slight variations in dialect exhibited by each village further distinguished tribelet membership and its ethos.

Some research has indicated that the Livermore area was within the territory of the *Souyen* and *Saoam* tribelets (Margolin, 1978). In general, the tribelet territories were defined by geographic features and likely had several permanent villages and numerous ephemeral, short-term camps, typically used for resource gathering or hunting.

In addition to maintaining a diverse spectrum of dietary staples through hunting and gathering, the Ohlone used other techniques of land management. For instance, controlled burning of extensive areas was conducted each fall to promote the growth of seed-bearing annuals. The frequent use of fires selects for certain types of grasses that are quick to grow back and for fire-retardant bushes and shrubs. As the frequency of fires increases, the overall composition of the plant communities changes, and thus does that of the animal population. The size of the land available for grazing animals, such as deer, elk, and antelope, thus increases, along with their populations.

Indeed, the acorn was the most important dietary staple of the Ohlone—specifically the coast live oak (*Quercus agrifolia*) and valley oak (*Quercus lobata*) for their prolific acorn production. The acorns were ground to produce a meal that was leached to remove the bitter tannin. Technologically, the Ohlone crafted tule balsa, basketry, lithics such as mortars and metates, and household utensils. Riverine and littoral resources were also exploited when available or economically suitable.

Historic Setting

By 1850, the geographical area that represented Contra Costa County included the northern portion of present-day Alameda County. At this time, the area included *Misión San José* and several settlements: San Antonio, Squattersville, Union City, New Haven, and Mt. Eden along with a dozen ranchos (Marschner, 2000). Very little of this era exists today due to the destruction caused by the 1868 earthquake. During the Gold Rush period, Oakland had become the primary staging area for distributing goods and passengers between the Bay and the Sierra foothills. Meanwhile, the interior valleys, like present-day Livermore and Pleasanton, were ranchos, such as *Rancho Valle de San José*, *Rancho Santa Rita*, and *Rancho San Ramon*. Located west of the Livermore Valley, *Rancho Valle de San José* was partially owned by Juan Pablo Bernal and his

son, Agustín Bernal, who built an adobe in 1850 that remains today in Pleasanton. *Don Jose Maria Amador* owned the southern portion of *Rancho San Ramon*, and built a two-story adobe where Dublin is located today. These early ranchos were the foundation for much of the manufacturing and agricultural growth during the subsequent decades. During the late 19th century, with the completion of the transcontinental railroad, agricultural development in the Pleasanton, Dublin, and Livermore Valley region continued to increase through the 20th century.

Existing Environment

The SMMP project area represents a diverse region that varies in terms of ecological settings desirable for human settlement and in terms of the potential to yield significant cultural resources. As mentioned above, while early attention was paid to shellmounds in Bay Area archaeology, subsequent work has identified a diverse range of sites within the interior valleys of the greater Bay area, including the SMMP project area. Most documentation is pre-1960s for the vast majority of sites identified throughout the Bay Area, and no comprehensive inventory has been conducted for Alameda County.

In order to characterize the cultural resource signature within the SMMP project area, this section describes examples of previously recorded cultural resources located within the SMMP project area. Because the Zone 7 Well Master Plan project area overlaps with significant portions of the SMMP area, examples of the records search information collected for the Well Master Plan is presented in **Table 3-12.1**.

The types of prehistoric sites recorded in the SMMP project area include, but are not limited to, village sites, temporary camp sites, lithic scatters, and historic settlement features. The landscape within the SMMP area was radically different prior to farmland reclamation and watercourse reconstruction; consequently, surface geology can be used, in some cases, as a basis for archaeological site prediction. The locations of the recorded sites were entered into Geographic Information System (GIS) in order to analyze the distribution of sites relative to geologic landform characteristics (Helley & Graymer, 1997). The GIS layer indicated that the sites seem to aggregate around historic waterways or where streams such as Arroyo Mocho, have been straightened or narrowed. Approximately 70 percent of the sites were located within alluvial terrace deposits near waterways, while a handful were identified in basin deposits and within what are now gravel deposits. Further mapping of extinct waterways can help define areas of greater archaeological sensitivity.

Further based on the Zone 7 Well Siting records search, Reaches 7 and 10 appear to contain the largest collection of known cultural resources within the SMMP project area, and, as such, give a representative sample of the types of sites and features within the area. Two known prehistoric midden sites with burials (P-1 (CA-ALA-554) and P-2160 (CA-ALA-574)) and one historic ranch (P-2246) are located in the vicinity of the Arroyo de la Laguna and I-680. These sites are surrounded by open space and residential development. The site integrity of the prehistoric resources is unknown, and the historic ranch was completely destroyed during recent construction activities. Another prehistoric site (P-14 or CA-ALA-483) is located adjacent to the well field, west of Arroyo de la Laguna. The integrity of this site is unknown.

**TABLE 3.12-1
EXAMPLES OF CULTURAL RESOURCES IN THE SMMP PROJECT AREA**

Site Number	Site Integrity ^a / Site Type	Description of Cultural Resource Site
P-1 (CA-ALA-554)	Unknown / Prehistoric midden, burials	Prehistoric midden site. Lithic artifacts, bone artifacts, decorative items, groundstone, faunal remains, fire cracked rock, charcoal, a hearth feature, and more than 20 burials were recovered in a deposit measuring 135 m E/W and 170 m N/S. The thickness of the cultural layer averaged 75 cm thick.
P-2160 (CA-ALA-574)	Unknown / Prehistoric midden, burials	An extensive prehistoric midden with numerous burials, this site revealed pit features with fire affected rock, bone, shell, flaked stone, and groundstone artifacts. Recent efforts revealed the dimensions of the site to be 500 m E/W by 660m N/S. This site is now covered by recent housing developments.
P-2246	Totally destroyed / Historic ranch	Former location of the Kennedy Ranch, a site measuring 230 feet E/W by 430 feet N/S. This ranch was totally destroyed during recent construction activities.
P-14 (CA-ALA-483) (outside)	Unknown / Prehistoric site, burials	Prehistoric cultural deposit buried beneath 9 feet of alluvial and colluvial sediments in the southern portion, and less than 1' of sediments in the northern portion of the site. Groundstone, lithics, tools, faunal remains, charcoal, ornaments and burials were recovered. The deposit measures 330 m by 170 m, and is 0.3 m by 11 m deep.
P-1775	Unknown / Historic linear feature: canal	This feature is the Pleasanton canal, which follows the general route of a natural culvert, and provides drainage for the western Pleasanton area. Constructed in the 1960's; some areas are located underground and surrounded by building developments.
P-1776	Unknown / Historic linear feature: railroad grade	This feature is the Arroyo Mocho canal, a recently channelized flood control canal. It is V-shaped and earth-lined, measuring 150 feet wide at the top, 60 feet wide at the bottom, and 20 feet deep. Its present form dates to the 1960s.

^a Site integrity as noted at the time of recordation.

Note: 135 m E/W = 135 meters east-west; 170 m N/S = 170 meters north-south

SOURCE: Northwest Information Center, Sonoma State University.

In addition, a prehistoric site with burials was identified within the wellfield during trenching of a wastewater trunk line by the Livermore Amador Valley Water Management Agency (LAVWMA) in 1978. CA-ALA-413, covered by silt, was found approximately a quarter-mile east of Santa Rita Road along the banks of the Arroyo Mocho. At least three burials were exposed and removed, midden deposit up to 80 centimeters thick was recorded, and cultural features were reported. However, no final archaeological report was completed, and no formal determination of significance under CEQA criteria was made (Banks, 1978a).

Banks (1978b) recovered prehistoric burials and artifacts from the trunk line easement at CA-ALA-414, in the vicinity of Stoneridge Drive and Stone Point Way and south of the Arroyo Mocho Canal.

A number of historic-period resources have been recorded in the region as well, including: the Southern Pacific–San Ramon Valley Branch railroad grade historic feature (P-1785) and the

Arroyo Mocho Canal (P-1776). The railroad feature passes through the wellfield but is completely destroyed with the exception of portions of the old grade. Feature P-1776 is described above for the Hopyard Well field; the site integrity is unknown. By and large, the potential architectural and structural resources found within the region are related to agriculture; other resources are likely to occur, like farmsteads, canals, unpaved roads, bridges and so forth.

Paleontologic Resources

Paleontologic resources are the fossilized evidence of past life found in the geologic record. Despite the prodigious volume of sedimentary rock deposits preserved worldwide, and the enormous number of organisms that have lived through time, preservation of plant or animal remains as fossils is an extremely rare occurrence. Because of the infrequency of fossil preservation, fossils – particularly vertebrate fossils – are considered to be nonrenewable resources. Because of their rarity and the scientific information they can provide, fossils are highly significant records of ancient life. Paleontologic resource localities are those sites where the fossilized remains of extinct animals and/or plants have been preserved.

Rock formations that are considered of paleontologic sensitivity are those rock units that have yielded significant vertebrate or invertebrate fossil remains. The formations include but are not limited to, sedimentary rock units that contain significant paleontologic resources anywhere within its geographic extent.

The majority of the SMMP project area is underlain by Alluvial Terrace deposits (Qhfp) of Holocene and Pleistocene (Qpaf) ages (Helley & Graymer 1997). These types of sediments would not likely yield significant paleontologic remains because they are surface deposits that are not commonly considered fossil-bearing rock units. However, a number of Pleistocene mammalian localities have been identified east of Pleasanton in alluvial landforms and south of Livermore along the banks of Arroyo Valle (UCMP 2004). As a result, there is a potential that significant paleontologic resources can be identified even in areas of low sensitivity.

3.12.2 Regulatory Framework

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires a federal agency with jurisdiction over a federally funded, federally assisted, or federally licensed undertaking to take into account the effects of the lead agency's undertaking (or project) on properties listed or eligible for listing in the National Register of Historic Places or NRHP (16 United States Code 470 et seq.). Because future projects would likely require a permit from the U.S. Army Corps of Engineers (Corps) or Department of Water Resources, it is necessary for the project to comply with Section 106 of the NHPA.

For compliance with Section 106 of the NHPA, the lead federal agency (e.g., the Corps) is required to consult with the State Historic Preservation Officer (SHPO) prior to granting permits, funding, or other authorization of the undertaking. The Section 106 review process is implemented using a five-step procedure:

- Identification and evaluation of historic properties;
- Assessment of the effects of the undertaking on properties that are eligible for listing in the National Register;
- Consultation with the SHPO and other agencies for the development of an agreement that addresses the treatment of historic properties;
- Receipt of Advisory Council on Historic Preservation comments on the agreement or results of consultation; and
- Implementation of the project according to the conditions of the agreement.

To determine whether the proposed project could affect properties eligible for inclusion in the National Register, cultural sites (including archaeological, historical, and architectural properties) must be inventoried and evaluated for eligibility for listing in the National Register. Although compliance with Section 106 is the responsibility of the federal lead agency, the work necessary to fulfill compliance can be delegated to others. If no properties determined to be eligible for listing in the National Register would be affected by the project, the federal lead agency need not consult with the SHPO. However, if the project has the potential to result in an effect, the SHPO review is typically completed within 30 days from receipt of the inventory documentation.

The Section 106 process could apply to the proposed SMMP if, for example, the projects implemented under the SMMP require a Corps Section 404 permit for river and stream crossings or other waterways under the Corps' jurisdiction, in which case the Area of Potential Effect would be delineated (i.e., the area that could be indirectly or directly affected by project features). A Section 106 determination would be made once specific project sites and routes have been finalized.

The National Register Section 36 Code of Federal Regulations (CFR) 800.5(a)(1) criteria for adverse effect is as follows:

An undertaking has an adverse effect when it may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Section 36 CFR 800.5(a)(2) lists examples of adverse effects. Some examples are listed below:

- Physical destruction of or damage to all or part of the property.
- Alteration, isolation, removal of the property, or change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.
- Introduction of visual, audible, or atmospheric elements that diminish the integrity of the property's significant historic characteristics.

- Neglect of a property which causes its deterioration, unless such deterioration is consistent with cultural values.
- Transfer, lease, or sale of property out of federal ownership.

Consistency with County and Local Regulations, Goals, and Policies

Alameda County and the cities of Dublin, Pleasanton, and Livermore identify goals and policies in their General Plans that protect cultural resources within individual jurisdictions. The policies relevant to the project are presented in **Appendix 3.12** of this EIR. The proposed project would be consistent with these goals and policies of the affected jurisdictions.

3.12.3 Cultural Resources Impacts and Mitigation Measures

Due to the geographic scale of the reaches, the long-term approach to the projects within the individual reaches, and the wide range of actions that falls within the scope of the projects under the SMMP, this impact analysis is intended as a preliminary assessment of potential impacts on important cultural resources that could occur as a result of the implementation of the SMMP. Because this is an MEIR-level analysis, the extent of the level of impacts on specific cultural resources that could result from individual projects is not addressed in this document. However, additional specific analysis needs to be conducted such as identifying and defining specific impacts from individual impacts. While many sites have been identified within the SMMP project area, few have been revisited since their initial recordation, nor have many been evaluated or re-evaluated in accordance with Section 15064.5(a)(2-3) of the CEQA Guidelines, using the criteria outlined in the Section 5024.1 of the California Public Resources Code. A qualitative assessment of a given cultural resource and its significance is a necessary precursor to conclude whether a project may adversely affect an “historic resource”.

The impacts and mitigation measures identified in this section address types of activities that could significantly impact cultural resources including archaeological sites and historic buildings and structures. SMMP projects that include these types of activities would be required to implement the identified mitigation measures in an effort to reduce any impacts to a less-than-significant level. The identification of specific impacts and mitigation measures that are appropriate for a specific project will depend on both the nature of the cultural resources that are present and on the nature of the project. In some instances, mitigation measures must be developed in consultation with multiple agencies and other interested parties.

Significance Criteria

CEQA requires that lead agencies determine whether the proposed project may have a significant effect on archaeological and historical resources. The impact is deemed significant if the cultural resources meet the significance criteria of being “unique” and “important” as listed on the California Register of Historical Resources (CRHR), or are considered eligible for listing on the CRHR. Section 15064.5 of the California Public Resources Code states that, “a project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment”. Substantial adverse change is

further defined as “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially changed.” If the CEQA lead agency determines that a project may result in substantial adverse change of a historical resource, the project is determined to have a significant effect on the environment, and the impacts and measures to minimize the impacts must be addressed in the appropriate CEQA document. If a historical resource is found not to be significant under the qualifying criteria, it need not be considered further in the planning process.

CEQA emphasizes avoidance of archaeological and historical resources as the preferred means of reducing potential significant effects. If avoidance is not feasible, an excavation program or some other form of mitigation must be developed to mitigate the impacts.

According to the CEQA Guidelines (Section 15064.5(a)(3)), generally a resource shall be considered “historically significant” if the resource meets the criteria for listing on the CRHR (Public Resources Code SS5024.1 Title CCR, Section 4852). If a project were to cause an impact an archeological or historical site, it needs to be determined whether the site is an “historical resource”, which is defined as any site which:

- 1) is listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR, or is determined to be significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political or cultural annals of California; and
- 2) meets any of the following criteria:
 - a) is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
 - b) is associated with the lives of persons important in the past;
 - c) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
 - d) has yielded, or may be likely to yield, information important in prehistory or history.

In addition, a resource included in a local register of historical resources, as defined by Section 5020.1 (k) of the Public Resources Code or identified as a significant resource in an historical resource survey meeting the requirements of section 5024.1 (g) of the Public Resources Code, shall be presumed to be historically or culturally significant.

When a project would adversely affect an archaeological site, a lead agency shall first determine whether the site is a historical resource, as defined above. If it is determined that the archaeological site is a historical resource, the provisions of Public Resources Code Section 21084.1 (Historical Resources) apply. If an archaeological site does not meet the criteria, but does meet the definition of a “unique archaeological resource” in Public Resources Code Section 21083.2 (Archaeological Resources), the site must be treated in accordance with the provisions of Section 21083.2. Public Resources Code section 21083.2, subdivision (g), states

that “‘unique archaeological resource’ means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.”

Section 15064.5 provides that, in general, a resource not listed on state or local registers of historical resources shall be considered by the Lead Agency to be historically significant if the resource meets the criteria for listing on the CRHR. This section also provides standards for determining what constitutes a “substantial adverse change” that must be considered a significant impact on archaeological or historical resources.

Impact Mechanisms and Approach to Mitigation

In general, projects that include ground-disturbing activities such as grading and excavation have the potential to impact historic and prehistoric archaeological resources and may impact historic architectural resources if buildings would be demolished, moved, or altered—or if the setting of an historic resource would be substantially changed. Projects that entail minor surface disturbance or construction would likely result in negligible impacts to cultural resources. On the other hand, large-scale impacts can result from projects that require the movement of large quantities of sediment. In essence, as the intensity of construction impacts increases, the potential to impact cultural resources increases. **Table 3.12-2** summarizes the types of activities that can potentially cause significant impacts to cultural resources and lists mitigation approaches that typically would reduce or eliminate significant impacts to identified significant cultural resources. However, not all circumstances would result in reducing an impact to a less-than-significant level.

In order to address the scope of SMMP projects, this analysis considers mitigation strategies during specific planning and development of specific projects and implementation. Further, to adequately address the level of potential impacts for a specific SMMP project, and thereby design appropriate mitigation measures, the significance and nature of the cultural resources must be determined. Specific mitigation measures will be adopted, consistent with the project’s goals and objectives and the purposes of site-specific projects. Not all mitigation strategies would be applicable to all projects because site-specific projects would vary in terms of location; proximity to both known and unknown resources, and potential to impact those resources, in addition to the types of survey strategies needed given the characteristics of the physiographic setting. A range of mitigation measures could minimize the adverse impacts on cultural resources.

**TABLE 3.12-2
POTENTIAL IMPACT MECHANISMS AND POSSIBLE MITIGATION STRATEGIES**

Impact Mechanism	Mitigation Strategy
- Impacts on cultural resources from ground-disturbing activities (1-6). - Impacts on cultural resources from alteration of existing structures (1-3, 7). - Impacts on cultural resources from construction of new facilities (1-7). - Introduction of elements to the historic setting of a cultural resource site (1, 2, 7).	- Conduct cultural resource inventories and evaluations. - Avoid sites through project redesign. - Accidental discovery mitigation. - Monitor excavation work. - Conduct auger (probing) survey. - Conduct data recovery. - Document historic resources per HABS/HAER standards.

Note: Numbers in parenthesis indicate number of mitigation measures.

Specific mitigation strategies depend on the type of cultural resource that is affected and the type of the site. For example, an archeological site consisting of an isolated feature would require less mitigation than a long-term habitation site that contains burials.

Impacts and Mitigation Measures

Construction Impacts

Impact 3.12.1. Archaeological Resources: Construction activities associated with the SMMP could cause substantial adverse effects to known or unknown significant archaeological resources. Less than Significant with Mitigation.

Construction activities for the SMMP would include sediment removal and other forms of excavation activities that could impact unknown or poorly recorded cultural resources. Cultural resources, whether prehistoric or historic, are physical manifestations of cultural activity. As such, they constitute an important non-renewable resource, which has the potential of increasing our understanding of history and prehistory.

Archaeological sites may consist of both surface and subsurface components—often with more extensive evidence beneath the surface than what is visible at the surface. The SMMP project area constitutes numerous physiographic contexts that would have been favorable for human settlement prehistorically. Archaeological sites tend to recur in environmental settings desirable for human settlement, such as historic waterways and flat topography outside flood zones. Construction activities would cause potentially significant adverse effects to such existing archaeological sites. Such effects would be minimized by implementing mitigation measures.

Mitigation Measures

Mitigation Measure 3.12.1a: Cultural Resources Inventory. Zone 7 shall follow the following steps, which are typically taken to assess and mitigate potential impacts to cultural resources for the purposes of CEQA:

- Identify both previously recorded cultural resources and those not previously recorded.
- Evaluate the significance of cultural resources using CEQA guidelines.
- Identify the significance of impacts under CEQA of the proposed project within the project area.
- Develop and implement mitigation measures designed to avoid, minimize, rectify, or reduce or eliminate the effects of the project on significant cultural resources.

Minimally, a cultural resources inventory shall consist of a cultural resources records search to be conducted at the Northwest Information of the California Historical Resources Information System located at Sonoma State University; consultation with the Native American Heritage Commission (NAHC) and with interested Native Americans identified by the NAHC; a field survey (if one has not previously been conducted); recordation of all identified archaeological sites and historic buildings and structures on California Department of Parks and Recreation 523 Site Record forms; and preparation of a cultural resources inventory report describing the project setting, methods used in the investigation, results of the investigation, and recommendations for management of identified resources. Certain agencies, such as the Federal Highway Administration and California Department of Transportation (Caltrans), have specific requirements for inventory areas and documentation format.

Identified cultural resources that may be impacted by the SMMP shall be evaluated for eligibility for listing on the CRHR. Cultural resources that are eligible for the CRHR are considered to be significant cultural resources. Cultural resources that are identified within the project area subject to federal approval, permits, or funding shall also be evaluated for eligibility for listing on the NRHP. Cultural resources determined to be eligible for listing on the NRHP are automatically eligible for listing on the CRHR and are considered to be significant cultural resources.

Mitigation Measure 3.12.1b: Avoid Impacts on Cultural Resources. If feasible, impacts on identified cultural resources including prehistoric and historic archaeological sites, human remains, and historical buildings and structures shall be avoided. Methods of avoidance may include, but shall not be limited to, project re-design, project cancellation, or identification of protection measures such as capping or fencing.

If avoidance is not feasible, the following **Mitigation Measures 3.12.2, 3.12.3a, 3.12.3b, 3.12.3c, 3.12.4a, and/or 3.12.4b** shall be implemented as necessary.

Impact Significance after Mitigation: Less than Significant.

Impact 3.12.2. Archaeological Deposits: Project construction associated with the SMMP cause substantial effects to known, but unevaluated prehistoric and historic archaeological deposits from ground disturbing construction operations. Less than Significant with Mitigation.

Construction activities such as trenching and other subsurface excavation in areas known to contain archaeological sites, or suspected to have such sites, would disturb or destroy significant cultural resources. Cultural resource sites known to exist within project boundaries, that have not been previously tested for significance, and that cannot be avoided, would be tested for their distribution, integrity, and significance, prior to construction. Pre-construction testing is preferable to monitoring for these sites given their potential to be important resources. Due to the Native American concerns that construction could affect sacred sites or burials, there is the possibility that some form of mitigation requiring data recovery excavation could be required if significant resources are encountered and could not be avoided. Because data recovery can be time consuming and impede construction if it is left until construction is underway, testing to determine the need, if any, for such recovery would be performed as early as possible in the planning stages but after a 75 to 80 percent engineering threshold is met.

For sites of concern within the disturbance area of individual SMMP projects, particularly in existing right-of-ways or under paved urban roads, construction monitoring by a Native American and qualified archaeologist, followed by either avoidance of resources encountered during monitoring or scientific excavation and analysis of recovered materials in the sensitive areas could serve to mitigate the impacts. Without monitoring and avoidance/excavation, construction trenching and subsurface excavation could cause minor impacts to resources determined to not be significant resources and could cause significant impact to resources determined to be cultural or scientifically significant or eligible for nomination to the California Historic Landmarks list. Implementation of mitigation would minimize such potentially significant impacts.

Mitigation Measures

Mitigation Measure 3.12.2a: Archaeological testing and Data Recovery. In the event, that it is infeasible to avoid impacts on archaeological sites that have been determined to be eligible for listing on the CRHR or the NRHP (significant resources), additional research including, but not necessarily limited to, archaeological excavation shall be conducted (CCR Section 15126.4 (b)(3)(C)). This work shall be conducted by a qualified archaeologist and shall include preparation of a research design, additional archival and historical research, archaeological excavation, analysis of artifacts, features, and other attributes of the resource, and preparation of a technical report documenting the methods and results of the investigation in accordance with the California Office of Historic Preservation *Guidelines for Archaeological Research Design* (1991). The purpose of this work is to recover a sufficient quantity of data to compensate for damage to or destruction of the resource. The procedures to be employed in this data recovery program shall be determined in consultation with responsible agencies and interested parties, as appropriate. Where necessary, Zone 7 shall seek Native American input and consultation.

Mitigation Measure 3.12.2b: Archaeological Monitoring. If ground-disturbing activities that have the potential to impact archaeological remains were to occur in an area that has been determined by a qualified archaeologist to be sensitive for the presence of buried

archaeological remains, a qualified archaeologist shall be retained to monitor those activities. Archaeological monitoring shall be conducted in areas where there is a likelihood that archaeological remains may be discovered but where those remains are not visible on the surface. Monitoring shall not be considered a substitute for efforts to identify and evaluate cultural resources prior to the project initiation. Where necessary, Zone 7 shall seek Native American input and consultation.

Mitigation Measure 3.12.2c: Stop Work in the Event of an Archaeological Discovery.

If potentially significant cultural resources are discovered during ground-disturbing activities associated with project preparation, construction, or completion, work shall halt in that area until a qualified archaeologist can assess the significance of the find, and, if necessary, develop appropriate treatment measures in consultation with Alameda County and other appropriate agencies and interested parties. For example, a qualified archaeologist shall follow accepted professional standards in recording any find including submittal of the standard Department of Parks and Recreation (DPR) Primary Record forms (Form DPR 523) and location-related information to the California Historical Resources Information Center office (Northwestern Information Center). The consulting archaeologist shall also evaluate such resources for significance per the CRHR eligibility criteria (Public Resources Code Section 5024.1; Title 14 CCR Section 4852). If the archaeologist determines that the find does not meet the CEQA standards of significance, construction shall proceed. On the other hand, if the archaeologist determines that further information is needed to evaluate significance, Zone 7 shall be notified and a data recovery plan shall be prepared.

Mitigation Measure 3.12.2d: Comply with State Laws Pertaining to the Discovery of Human Remains. If human remains of Native American origin are discovered during project construction, it is necessary to comply with state laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (Pub. Res. Code Sec. 5097). If any human remains are discovered or recognized in any location on the project site, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

- The Alameda County Coroner/Sheriff has been informed and has determined that no investigation of the cause of death is required; and
- If the remains are of Native American origin,
 - The descendants of the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or
 - The Native American Heritage Commission was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the commission.

Impact Significance after Mitigation: Less than Significant.

Impact 3.12.3. Paleontologic Resources: Ground disturbing activities may adversely affect unidentified paleontologic resources at the site. Less than Significant with Mitigation.

As mentioned, the majority of the SMMP area is underlain by Alluvial Terrace deposits (Qhfp) of Holocene and Pleistocene (Qpaf) ages (Helley & Graymer, 1997). These types of sediments would not likely yield significant paleontologic remains because they are surface deposits that are not commonly considered fossil-bearing rock units. However, a number of Pleistocene mammalian localities have been identified east of Pleasanton in alluvial landforms and south of Livermore along the banks of Arroyo Valle (UCMP, 2004).

There is a possibility that excavation as a part of the construction activities could result in significant fossil discoveries in areas designated as having low potential. Such activities can have a deleterious effect on the resources, which would be a significant impact. This impact would be reduced to a less-than-significant level with the incorporation of the following mitigation measure.

Mitigation Measures

Mitigation Measure 3.12.3a: Stop work in the event of a paleontologic discovery. An appointed representative of Zone 7 shall notify a qualified paleontologist of unanticipated discoveries, document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in Section 15064.5 of the CEQA Guidelines. In the event of an unanticipated discovery of a fossil during construction, excavations within 50 feet of the find shall be temporarily halted or diverted until the discovery is examined by a qualified paleontologist as per the Society of Vertebrate Paleontology (SVP) standards (SVP 1995; 1996). The paleontologist shall notify Zone 7 to determine procedures that would be followed before construction is allowed to resume at the location of the find. If Zone 7 determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan to mitigate the effect of the project on the qualities that make the resource important, and such plan shall be implemented. The plan shall be submitted to Zone 7 for review and approval.

Impact Significance after Mitigation: Less than Significant.

Impact 3.12.4. Historic Architectural Resources: Construction of SMMP projects could adversely affect historic architectural resources through demolition or significant changes to the historical setting. Less than Significant with Mitigation.

Construction of SMMP projects could result in potential impacts on significant historic architectural resources on a project basis. Historic architectural resources may be impacted both directly by demolition or relocation of bridges or other structures, or indirectly through significant changes in the historical setting of buildings. Demolition of historically significant buildings is considered to be a significant impact to the environment. To reduce this impact to a less-than-significant level, Zone 7 would implement mitigation measures listed above; **Mitigation Measures 3.12.1a (identification) and 3.12.1b (avoidance).**

In the event, it is not feasible to avoid direct and indirect impacts on historically significant buildings, implementation of **Mitigation Measure 3.12.4a** shall be considered to minimize the impact. In case full demolition or removal of the historic resource is unavoidable, implementation of **Mitigation Measure 3.12.4b** would reduce adverse affects, but not to a level of less-than-significant.

Mitigation Measure 3.12.4a: Follow standards for the Treatment of Historic Properties. Any alterations, including relocation, to historic buildings or structures shall conform to the Secretary of the Interior's Standards for the Treatment of Historic Properties and Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (1995).

Mitigation Measure 3.12.4b: Record buildings or Structures to Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) standards. If avoidance or relocation of an historic resource is not feasible, a qualified architectural historian shall be retained to document the impacted historical architectural resource to HABS and HAER standards. HABS and HAER documentation packages shall be entered into the Library of Congress as well as the Northwest Information Center of the California Historical Resources Information System. The recordation of a building or structure to HABS/HAER standards will reduce impacts on significant historic buildings and structures, but would not reduce it to a less-than-significant level. Impacts on significant historic buildings under these circumstances would remain significant and unavoidable.

Impact Significance after Mitigation: Less than Significant with **Mitigation Measure 3.12.4a**. Significant and Unavoidable at the MEIR level in case avoidance is not feasible.

**TABLE 3.12-3
SUMMARY OF CULTURAL RESOURCE IMPACTS BY PROJECT**

Reach/ Project	Construction Impacts			
	Impact 3.12.1 Archeological Resources	Impact 3.12.2 Archaeological Deposits	Impact 3.12.3 Paleontologic Resources	Impact 3.12.4 Historic Architectural Resources*
Reach 1				
R.1-1	LSM	LSM	LSM	LSM/SU
R.1-2	LSM	LSM	LSM	LSM/SU
R.1-3	LSM	LSM	LSM	LSM/SU
R.1-4	LSM	LSM	LSM	LSM/SU
R.1-5	LSM	LSM	LSM	LSM/SU
R.1-6	LSM	LSM	LSM	LSM/SU
R.1-7	LSM	LSM	LSM	LSM/SU
Reach 2				
R.2-1	LSM	LSM	LSM	LSM/SU
R.2-2	LSM	LSM	LSM	LSM/SU
R.2-3	LSM	LSM	LSM	LSM/SU
Reach 3				
R.3-1	LSM	LSM	LSM	LSM/SU
R.3-2	LSM	LSM	LSM	LSM/SU
R.3-3	LSM	LSM	LSM	LSM/SU
R.3-4	LSM	LSM	LSM	LSM/SU
R.3-5	LSM	LSM	LSM	LSM/SU
Reach 4				
R.4-1	LSM	LSM	LSM	LSM/SU
R.4-2	LSM	LSM	LSM	LSM/SU
Reach 5				
R.5-1	LSM	LSM	LSM	LSM/SU
R.5-2	LSM	LSM	LSM	LSM/SU
R.5-3	LSM	LSM	LSM	LSM/SU
Reach 6				
R.6-1	LSM	LSM	LSM	LSM/SU
R.6-2	LSM	LSM	LSM	LSM/SU
Reach 7				
R.7-1	LSM	LSM	LSM	LSM/SU
R.7-2	LSM	LSM	LSM	LSM/SU
R.7-3	LSM	LSM	LSM	LSM/SU
Reach 8				
R.8-1	LSM	LSM	LSM	LSM/SU
R.8-2	LSM	LSM	LSM	LSM/SU
R.8-3	LSM	LSM	LSM	LSM/SU
R.8-4	LSM	LSM	LSM	LSM/SU
Reach 9				
R.9-1	LSM	LSM	LSM	LSM/SU
R.9-2	LSM	LSM	LSM	LSM/SU
R.9-3	LSM	LSM	LSM	LSM/SU
R.9-4	LSM	LSM	LSM	LSM/SU
R.9-5	LSM	LSM	LSM	LSM/SU
R.9-6	LSM	LSM	LSM	LSM/SU
R.9-7	LSM	LSM	LSM	LSM/SU
Reach 10				
R.10-1	LSM	LSM	LSM	LSM/SU
R.10-2	LSM	LSM	LSM	LSM/SU
R.10-3	LSM	LSM	LSM	LSM/SU
R.10-4	LSM	LSM	LSM	LSM/SU
R.10-5	LSM	LSM	LSM	LSM/SU

TABLE 3.12-3 (continued)
SUMMARY OF CULTURAL RESOURCE IMPACTS BY PROJECT

Reach/ Project	Construction Impacts			
	Impact 3.12.1 Archeological Resources	Impact 3.12.2 Archaeological Deposits	Impact 3.12.3 Paleontologic Resources	Impact 3.12.4 Historic Architectural Resources*
Reach 11				
R.11-1	LSM	LSM	LSM	LSM/SU
R.11-2	LSM	LSM	LSM	LSM/SU
Reach 12				
R.12-1	LSM	LSM	LSM	LSM/SU
R.12-2	LSM	LSM	LSM	LSM/SU

LSM = Less than Significant with Mitigation

LTS = Less than Significant

N = No Impact

*SU = Significant and Unavoidable at MEIR level (in case avoidance is infeasible)

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3.13 Visual Resources

3.13.1 Setting

Regional Setting

The Livermore-Amador Valley contains visual resources representative of California's northern coast range and inland valley landscapes. These visual elements include expansive grass-covered grazing lands; steep, rolling hills and narrow ravines; broad valleys, and prominent ridges; meandering tree-lined creeks and drainages; oak woodlands; and various agricultural lands, including pasturelands, vineyards, dry farmlands, orchards, and row croplands. Peaks and ridgelines of the Diablo Range and Las Trampas/Pleasanton/Sunol range are visually prominent landform features. The visual quality of the area is based largely on its suburban, pastoral character and its topographic diversity.

Both interstate highways passing through the Livermore Valley Area—Interstate-580 (I-580), oriented east-west and I-680, oriented north-south—provide panoramic views. I-580 is an Alameda County-designated scenic highway. I-680 is an officially designated State Scenic Highway, which requires special measures by local governments to protect views along the travel corridor.

Existing Environment

The SMMP reaches are located in the Livermore Valley (see **Figure 2-3 in Chapter 2, Project Overview and Description**). Each reach contains a variety of land uses, including existing and future residential, commercial, industrial, agricultural, and open space. A few examples of land use types are given below in **Table 3.13-1**.

TABLE 3.13-1
DESCRIPTIONS OF LAND USE CATEGORIES

Land Use	Examples of Uses
Residential	Single and/or multi-family houses
Commercial	Shops, business parks, malls, and gas stations
Industrial	Railroad tracks, warehouses, car maintenance shops, and quarry areas
Public	Alameda County Fairgrounds, golf courses, and parks
Agricultural	Open rangelands, farms, and vineyards

SOURCE: ESA

Visual characteristics and short-range views within each reach are determined by the topography of the land and the uses within that reach. Predominant land uses in each reach are defined in **Table 3.13-2**.

**TABLE 3.13-2
REACH CHARACTERISTICS**

Reach	Visual Characteristics
1	Predominantly open space and agriculture, with industrial and residential
2	Residential, industrial, commercial and agriculture
3	Predominantly open space and agriculture, with residential and industrial
4	Open space and agriculture, residential and public use
5	Predominantly open space, agriculture and resource management, with commercial and residential
6	Predominantly sand and gravel harvesting, public use/water management, and industrial, with residential and commercial
7	Predominantly residential, with mix of all uses
8	Predominantly residential and commercial, with industrial
9	Residential, commercial, open space/agriculture
10	Residential, parks and recreation, agriculture
11	Predominantly agriculture and grazing, parks and recreation
12	Parks and agriculture

SOURCE: ESA

Short range (10 to 20 feet away) and medium range (more than 20 feet away) views of project sites would depend on the land use of the individual sites. The planning area is within the topographically flat Livermore Valley. Due to the flat terrain, views are limited in distance. Most SMMP projects would only cause visual impacts during construction. Overall, the projects are not structural in nature and often involve long-term aesthetic improvements to areas in or along waterways. Due to most projects being located in or near channel, they would only be visible at close range. **Table 3.13-3** shows potential impacts to visual resources based on type of construction activity and type of work.

Several existing features of SMMP project sites would be removed or modified as part of SMMP projects. Removal or modification of these structures would result in potential long-term beneficial impacts to visual resources. These structures include fish barriers like concrete aprons, bridge footings, and drop structures.

3.13.2 Regulatory Framework

The policies and regulations associated with impacts to visual resources within the applicable jurisdictions are presented in **Appendix 3.13** of this EIR.

**TABLE 3.13-3
VISUAL IMPACTS BY TYPES OF PROJECTS**

Work Category	Construction Activities	Visual Impacts
1) Low-flow Channel	Temporary damming, pumping, excavation, earthmoving, compaction and grading, hauling, planting.	Temporary impacts during construction
2) Sediment Removal	Temporary damming, earthmoving, stockpiling, hauling, excavation.	Temporary impacts during construction
3) Riparian Projects	Drilling, clearing and grubbing, concrete work, excavation, compaction, road work, earthmoving, utility work, temporary damming, backfilling, pumping.	Temporary impacts during construction and potential long-term beneficial impacts
4) Sediment Basins	Excavation, hauling, clearing and grubbing, concrete work, earthmoving.	Temporary impacts during construction, permanent vegetation removal.
5) Trails Along Streams	Clearing and grubbing, grading, paving, compaction, earthmoving, minor excavation.	Temporary impacts during construction, permanent vegetation removal, viewshed impacts.
6) Bio-technical Stabilization/ Bank stabilization	Grading, terracing, excavation, earthmoving, compaction, hauling.	Temporary impacts during construction
7) Constructed Wetlands	Excavation, hauling, grading.	Temporary impacts during construction and potential long-term beneficial impacts
8) Mitigation for Sediment Removal	NA	NA
9) Vegetation Management	Planting, earthmoving, excavation.	Temporary impacts during construction
10) Buffer/Land Dedication	NA	NA
11) Non-native Species Removal	Hand clearing, mechanical clearing, chemical clearing, hauling.	Temporary impacts during construction
12) Remove/Replace Fish Barriers	Temporary damming, hauling, demolition.	Temporary impacts during construction. Beneficial visual impact.

Note: NA = Not Applicable.

Source: Zone 7, 2006.

3.13.3 Visual Resources Impacts and Mitigation Measures

Significance Criteria

This section addresses potential project impacts to visual aesthetics. The impact significance criteria are based on guidance provided by CEQA regarding what constitutes a significant environmental effect (Guidelines Sections 15064, 15126, and Appendix G). For this DEIR, the following impact significance criteria are used:

The project would have a significant impact if it would have a substantial, demonstrable negative aesthetic effect on the surrounding environment. A negative aesthetic effect could occur if the project caused substantial alterations to or degradation of the visual

environment and/or if the project conflicted with an adopted policy regarding aesthetics and visual resources.

Impacts and Mitigation Measures

Construction Impacts

Impact 3.13.1. Visual Aesthetics: Construction of the SMMP projects could substantially alter or diminish the visual aesthetics of the surrounding environment. Less than Significant with Mitigation.

Table 3.13-3 lists types of impacts to visual resources based on work categories that would be conducted as a part of SMMP. Most of the categories would have temporary impacts to visual resources during construction. These include low-flow channel creation, sediment removal, riparian projects, sediment basin construction, trail building, bio-technical bank stabilization/bank stabilization, wetland creation, and vegetation management. Table 2-5 in Chapter 2, Project Description, describes the impacts from projects by work category. Temporary visual impacts would result from clearing and grubbing, vegetation removal and presence of equipment and vehicles at project sites. This could be a significant impact. With implementation of Mitigation Measures 3.13.1a through 3.13.1d, these impacts would be reduced to a less-than-significant level.

Mitigation Measures

Mitigation Measure 3.13.1a: Revegetation Plan. Individual projects shall include development of a revegetation or restoration plan to facilitate re-establishment of native vegetation within affected stream channel locations. The restoration plan shall be focused on minimizing the temporary effects of in-channel disturbance, and shall be consistent with restoration activities for erosion control. New plants would include grasses, shrubs, and trees typical of the surrounding area. The contractor shall be required to warrant landscape plantings for one year after project completion.

Mitigation Measure 3.13.1b: Restoration to Pre-Project Conditions. Zone 7 shall ensure that its contractors restore disturbed areas to their pre-project condition so that short-term construction disturbance does not result in long-term visual impacts (Also see **Mitigation Measures 3.4.1b and 3.4.1c in Section 3.4, Land Use**).

Impact Significance after Mitigation: Less than significant.

Long-term Operational Impacts

Impact 3.13.2. Alter Visual Conditions: Implementation of individual SMMP projects could alter existing visual conditions, resulting in significant effects to short-range and long-range view. Less than Significant with Mitigation.

The SMMP would have the potential to result in long-term visual impacts such as projects that include construction and maintenance of sediment basins and trails along streams. Sediment

basins would be built using concrete and initially would be bare of vegetation. Eventually vegetation growth in the basin would improve the aesthetic appearance of the basin. Periodic removal of the sediment would repeat this cycle of vegetative growth. Therefore, the long-term effect is considered minimal.

Several SMMP projects would also include trails that would be constructed along waterways and channels. The trails would represent parallel linear features consistent with the existing visual character of the flood control channels. Where appropriate, trails would be landscaped to provide aesthetic enhancements. Therefore, although the installation of recreational trails would alter the existing visual conditions along stream channels, this alteration would not be considered significant.

Mitigation Measures

Mitigation Measure 3.13.2a: Landscape Plan. Zone 7 shall use design elements to enhance visual integration of any above-ground components with their surroundings.

Mitigation Measure 3.13.2b: Agency Coordination. Zone 7 shall coordinate with the affected jurisdiction regarding the design of facilities.

Impact Significance after Mitigation: Less than significant.

**TABLE 3.13-4
SUMMARY OF VISUAL IMPACTS BY PROJECT**

Reach/ Project	Construction Impact	Long-term Operational Impact
	Impact 3.13.1 Visual Aesthetics	Impact 3.13.2 Alter Visual Conditions
Reach 1		
R.1-1	LSM	LSM
R.1-2	LSM	LSM
R.1-3	LSM	LSM
R.1-4	LSM	LSM
R.1-5	LSM	LSM
R.1-6	LSM	LSM
R.1-7	LSM	LSM
Reach 2		
R.2-1	LSM	LSM
R.2-2	LSM	LSM
R.2-3	LSM	LSM
Reach 3		
R.3-1	LSM	LSM
R.3-2	LSM	LSM
R.3-3	LSM	LSM
R.3-4	LSM	LSM
R.3-5	LSM	LSM
Reach 4		
R.4-1	LTS	n/a
R.4-2	LSM	LSM
Reach 5		
R.5-1	LSM	LSM
R.5-2	LSM	LSM
R.5-3	LSM	LSM
Reach 6		
R.6-1	LSM	LSM
R.6-2	LSM	LSM
Reach 7		
R.7-1	LSM	LSM
R.7-2	LSM	LSM
R.7-3	LSM	LSM
Reach 8		
R.8-1	LSM	LSM
R.8-2	LSM	LSM
R.8-3	LSM	LSM
R.8-4	LSM	LSM
Reach 9		
R.9-1	LSM	LSM
R.9-2	LSM	LSM
R.9-3	LSM	LSM
R.9-4	LSM	LSM
R.9-5	LSM	LSM
R.9-6	LSM	LSM
R.9-7	LSM	LSM
Reach 10		
R.10-1	LSM	LSM
R.10-2	LSM	LSM
R.10-3	LSM	LSM
R.10-4	LSM	LSM
R.10-5	LSM	LSM

TABLE 3.13-4 (continued)
SUMMARY OF VISUAL IMPACTS BY PROJECT

Reach/ Project	Construction Impact	Long-term Operational Impact
	Impact 3.13.1 Visual Aesthetics	Impact 3.13.2 Alter Visual Conditions
Reach 11		
R.11-1	LSM	LSM
R.11-2	LSM	LSM
Reach 12		
R.12-1	LSM	LSM
R.12-2	LSM	LSM

LSM = Less than Significant with Mitigation
LTS = Less than Significant
N = No Impact
n/a = not applicable

References – Visual Resources

Alameda County, *East County Area Plan, Volume 1: Goals, Policies and Programs*, Adopted: May 5, 1994. Last amended: 2002.

City of Dublin, *General Plan*, Retrieved March 21, 2005 from
http://www.ci.dublin.ca.us/Dublin_General_Plan.pdf.

City of Livermore webpage, *General Plan*, Retrieved February 28, 2005 from
http://www.ci.livermore.ca.us/general_plan/general_plan.html

City of Pleasanton, *General Plan*, August, 1996.

Zone 7 Water Agency. 2006. *Stream Management Master Plan*. Prepared by RMC 2006

CHAPTER 4

Growth Inducement Potential and Secondary Effects of Growth

4.1 Introduction

4.1.1 CEQA Definition of Growth Inducement

The CEQA *Guidelines* require that an EIR evaluate the growth-inducing impact of a proposed action. A growth-inducing impact is defined as follows:

The ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a water treatment plant might, for example, allow for more construction in service areas). . . . It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.¹

The environmental effects of a proposed project's induced growth are secondary, or indirect, impacts. Secondary effects of growth can result in significant increased demand on community and public service infrastructures, increased traffic, noise, degradation of air and water quality, and the conversion of agricultural and open space land to urbanized uses.

4.1.2 Overview

Growth-Inducement Potential

Based on the CEQA definition above, assessing the growth-inducement potential of the Stream Management Master Plan (SMMP) Project involves answering the question: Will implementation of the project directly or indirectly support economic expansion, population growth, or residential construction? The primary purpose of the SMMP is to provide flood protection and maintain waterways in the Zone 7 service area for biological, water supply and water quality purposes. Zone 7 channels will be maintained to be able to carry the 100-year (1 percent) flood, or existing design, and to maintain the channel conditions upon which the Federal Emergency Management Agency (FEMA) flood insurance mapping is based. Increased protection of areas within the 100-year floodplain could lead to increased development in areas receiving increased flood protection. If the increase in flood protection due to conveyance and retention projects under the SMMP resulted in unplanned development, growth could result.

¹ CEQA *Guidelines* Section 15126.2(d).

However, Zone 7's activities only maintain the infrastructure supporting existing and planned land uses and do not alter the land use or economic constraints to the surrounding floodplain. The purpose of Zone 7's channels is water conveyance, which does not increase growth potential, therefore Zone 7's maintenance activities are not growth-inducing. Minor routine maintenance activities as listed in the Project Description do not increase the population-serving capacity of Zone 7's facilities, and are therefore not growth-inducing.

Other factors complicate the growth equation such as the General Plans and policies of the cities and counties in the service area. The availability of water supply, wastewater disposal capacity, public schools, and transportation services influence business and residential development and accompanying population growth in the planning area. Growth inducement may constitute an adverse impact if the growth is not consistent with the land use plans and growth management plans and policies for the area affected. Local land use plans provide for land use development patterns and growth policies that allow for the orderly expansion of urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer service and solid waste service.

A project that would induce "disorderly" growth that is in conflict with local land use plans could indirectly cause additional adverse environmental impacts and impacts to other public services. Thus, it is important to assess the degree to which the growth accommodated by a project would or would not be consistent with applicable land use plans. The SMMP has been designed to reflect growth management plans within the Zone 7 service area within the context of providing flood protection and drainage, reduction in erosion and sedimentation, protection of water supply, water quality, habitat and the environment and provision of recreation, trails and public education. This project would protect areas adjacent to waterways and in flood-prone developed areas from projected flooding during a 100-year storm. These efforts are based on the flooding projected to result at the level of development estimated to occur under the approved General Plans within the Zone 7 service area. Development that could occur as the result of flood protection projects would serve only planned for growth approved by the local jurisdictions within Zone 7's service area.

Additionally, location within the FEMA 100-year floodplain does not necessarily restrict development in the same way that lack of basic infrastructure or services would. Individual developments have the ability to implement localized improvements to provide adequate freeboard during a 100-year event, and may subsequently request a Letter of Map Revision (LOMR) from FEMA. Alternatively, development may elect to purchase flood insurance. It should be noted that areas within the Livermore Valley mapped as within the 100-year floodplain are currently developed. Provision of regional flood protection in order to reduce the potential for these areas to be flooded during a 100-year event would not alter the location, rate, or distribution of development within the Livermore Valley. As such, implementation of the SMMP to provide regional flood protection would not result in growth inducement, or secondary effects of growth.

4.2 Growth Analyses in Zone 7 Service Area

The planned-for growth in the Zone 7 service area was analyzed recently as part of environmental review of Zone 7's *Water Supply Planning Program* (WSPP) (certified on January 21, 1999, SCH# 98041040). While the growth analysis in these documents is based on provision of water supply, it represents a comprehensive review of the approved General Plans within the Zone 7 service area. This level of development identified by the approved General Plans within the Zone 7 service area represents the future development that the flood control components of the SMMP are designed to protect. Therefore the 1999 WSPP EIR analyzed the same projected growth that the SMMP projects are designed to accommodate. A summary of the 1999 WSPP EIR and its conclusions is provided below.

4.2.1 Zone 7 1999 Water Supply Planning Program EIR

Chapter 7 of the WSPP EIR evaluated the growth inducement potential and secondary effects of growth associated with the acquisition of water supply and development of additional treatment, storage and conveyance facilities to meet water demands associated with 2020 buildout under the adopted General Plans within its service area. It acknowledges that implementation of the Near-Term Project and Long-Term Program would increase Zone 7's water treatment, supply and distribution capacity in order to serve additional urban growth that is planned and anticipated to occur within Zone 7's service area. Water demand projections used by Zone 7 in development of the Near-Term Project and Long-Term Program were consistent with the more detailed water demands developed by the Zone 7 Retailers, and therefore would indirectly support growth that is consistent with the local General Plans and regional growth management projections.

The WSPP identified potentially significant impacts of growth based on the analyses provided by the various municipalities located in Zone 7's service area, and identified both significant and mitigable, and significant and unavoidable impacts in the issue areas of land use, air quality, traffic and transportation, visual and aesthetic resources, geology, biological resources, public services and utilities, hydrology and water quality, cultural resources, recreation, noise, and energy resources. In addition, the 1999 WSPP EIR analyzed the cumulative secondary effects of growth for the broader region beyond Zone 7's immediate service area, and included topical discussions on land use, surface water hydrology, water quality, wastewater capacity, air quality, biological resources, and traffic and circulation. WSPP EIR Table 7-11 (see also **Table 4-1**, below) identifies all potentially significant impacts identified in the EIR within the Zone 7 service area and the regional area. It also identified mitigation measures to partially reduce the unavoidable impacts.

As specified in the 1999 WSPP, the city and county jurisdictions that have adopted the land use plans and approved the development projects within the Zone 7 water service and broader Tri-Valley area have adopted statements of overriding considerations to address adopting plans with significant and unavoidable impacts. **Table 4-1**, taken from the 1999 WSPP EIR, provides a list of social, economic, and other considerations found to outweigh the potential secondary effects of proposed growth and development.

TABLE 4-1
KEY OVERRIDING CONSIDERATIONS FOR SIGNIFICANT, UNAVOIDABLE IMPACTS OF
PLANNED GROWTH AND DEVELOPMENT

- Accommodation of ABAG-projected growth^a
- Provision for balanced jobs/housing balance^{a,b,d}
- Furtherance of regional housing share objectives and provisions of affordable housing^{a,b}
- Provision and maintenance of affordable housing: rental housing and attached housing near commercial and employment uses^e
- Provision of housing near growing regional employment centers^{b,d}
- Location of development where it can be efficiently served with public services and utilities^e
- Job creation^{b,e}
- Increased sales revenue^b
- Enhancement of wine-producing image and creation of investment incentives and perpetuation of agricultural uses^e
- Minimization of vehicle-miles traveled by providing housing near employment^c
- Minimization of energy consumption and air pollution from automobile commuting^c
- Minimization of traffic congestion^c
- Establishment of an urban growth boundary^{a,e}
- Establishment of policies to preserve agricultural lands^{a,e}
- Establishment of policies to preserve open space lands^{d,e}
- Comprehensive resource management^{a,b}
- Comprehensive open space/recreation planning, implementation, and management^{a,b,d}

^a Alameda County Board of Supervisors, 1994.

^b City of Dublin City Council, 1993.

^c City of Pleasanton, 1996b.

^d City of Livermore, October 1993b.

^e City of Livermore, 1997d.

SOURCE: Compiled by ESA from sources listed at the end of this chapter.

In addition to the overriding considerations, each jurisdiction has identified policies and programs intended to limit or reduce the potential impacts of growth. Implementation of these measures is beyond the jurisdiction of Zone 7, which does not have the authority to regulate land use and growth within its service areas. The three cities and Alameda County have primary land use jurisdiction and responsibility to regulate growth through the land use planning and development approval process. Zone 7 has jurisdiction and service responsibility for water supply and regional flood control. It can mitigate identified significant and unavoidable impacts to water supply and regional flooding by providing the necessary facilities and services such that planned growth is not constrained by inadequate service. Recognizing that implementation of the WSPP would remove a potential obstacle to growth, the Zone 7 Board of Directors adopted findings and a statement of overriding considerations for secondary effects of growth associated with buildout under the approved General Plans within the Zone 7 service area (Resolution 99-0256, adopted July 21, 1999). For a detailed discussion and analysis of growth-inducement potential and secondary effects of growth, please refer to the 1999 WSPP EIR. This document is available for review at the Zone 7 Administrative Offices, located at 100 North Canyons Parkway, in Livermore, California.

Conclusion

Growth potential and secondary impacts of growth have been evaluated in detail in the *Zone 7 Water Supply Planning Program (WSPP) EIR*. While the effects of that project differ from those of the *Zone 7 Stream Management Master Plan (SMMP)*, the geographic area and level of growth analyzed is equivalent to that for the SMMP. The 1999 WSPP EIR identified potential growth impacts associated with buildout of the service area, and the mitigation programs that local jurisdictions have adopted to minimize the effects of growth. These jurisdictions also adopted Statements of Overriding Considerations to address significant, unavoidable impacts. Similarly, Zone 7 has adopted a Statement of Overriding Considerations for secondary effects of growth associated with buildout under the approved General Plans within Zone 7's service area. The SMMP will not directly or indirectly support economic expansion, population growth, or residential construction in the Zone 7 service area. Zone 7's activities under the SMMP maintain the infrastructure which supports existing and planned land uses and do not alter the land use or economic constraints in the surrounding floodplain. Therefore, this project will not result in growth inducement.

References – Growth Inducement Potential and Secondary Impacts of Growth

Association of Bay Area Governments, *Projections 2005*, 2005.

CEQA Guidelines, Section 15126.2(d), *Growth-Inducing Impact of the Proposed Project*. 2005.

Zone 7 Water Agency, *Water Supply Planning Program – Program EIR*, 1999.

Zone 7 Water Agency, *Alternative 3 Treated Water Demands*, 2002.

CHAPTER 5

Cumulative Impacts

5.1 CEQA Analysis Requirements

A cumulative impact results from a combination of the project evaluated in an EIR together with other projects causing related impacts. The purpose of this analysis is to disclose significant cumulative impacts resulting from the implementation of the SMMP in combination with other projects or conditions in the area, and to indicate the severity of the impacts and their likelihood of occurrence. The CEQA Guidelines require that EIRs discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects. CEQA Guidelines Sections 15130 (a) and (b) state:

- (a) An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065(c). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.
 - (1) As defined in Section 15355, a cumulative impact is an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.
 - (2) When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. A lead agency shall identify facts and analysis supporting the lead agency's conclusion that the cumulative impact is less-than-significant.
 - (3) An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. The lead agency shall identify facts and analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable.
- (b) The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by

standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact. The following elements are necessary for an adequate discussion of significant cumulative impacts:

- (1) Either:
 - (A) 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
 - (B) 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. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.

The analysis of cumulative impacts in this chapter focuses on the impacts of implementation of the SMMP concurrent with other spatially and temporally proximate (i.e., close in location or timing) projects within the context of past, present and reasonably foreseeable future projects.

5.2 Approach for Analysis

The proposed SMMP would address flood control and other drainage issues in and around the cities of Dublin, Pleasanton, and Livermore in addition to some unincorporated areas in eastern Alameda County. The SMMP includes 45 individual projects on streams, arroyos, and channels in the project area to address the future 100-year flows (build out scenario). See **Chapter 2, Project Description** for details. The SMMP is intended to meet the stream management needs in the Zone 7 service area through the build out of the general plans of the cities and county in the project area, i.e., of Dublin, Pleasanton, Livermore, and Alameda County. Therefore, individual projects within the SMMP would be implemented through the course of the planning horizons of these general plans, i.e., 2020-2030. Individual project implementation would be contingent upon funding sources and agency partnering. In general, design and permitting activities for individual projects are anticipated to be completed in a two to four year timeframe, with construction activities being implemented during dry season months.

Because a project-specific implementation schedule is not known at this time and the projects are not fully designed or developed, assessment of specific cumulative impacts in the entire project area would be speculative. Therefore, this analysis uses the “plan” approach as listed in *CEQA Guidelines* Section 15130 (b). This approach incorporates a summary of projections (conditions contributing to cumulative impacts in the project area) from the general plans in order to more fully address potentially significant effects of these projections in combination with the proposed project implementation. This analysis also considers projects in the Capital Improvement Programs (CIPs) for flood control and drainage improvement planned by the county and the cities in the project area. Given that the purpose and nature of the CIPs and the proposed SMMP are

similar, this discussion provides a more realistic comparison of similar kinds of projects and the resulting cumulative impacts that are directly relevant.

5.2.1 Regional General Plans and Environmental Documents

In accordance with the CEQA Guidelines, this chapter presents a cumulative impact analysis of the SMMP implementation in combination with the projected projects as discussed in the general plans, CIPs, and published environmental documents, if applicable. Documents referenced in this discussion are,

- City of Dublin General Plan: The most recent general plan for the City of Dublin was adopted on February 11, 1985 and updated on November 5, 2002, and contains projections through 2010.
- City of Dublin General Plan EIR: The most recent EIR for the City of Dublin General Plan was prepared on February 8, 1984 and contains projections through 2005.
- City of Pleasanton General Plan: The City of Pleasanton General Plan was adopted on August 6, 1996 and contains projections through 2010.
- City of Pleasanton General Plan EIR: The most recent General Plan EIR is the Draft EIR for the 1996 General Plan Update. The Final EIR published on May 3, 1996 included response to comments on the Draft EIR.
- City of Livermore General Plan: The most recent general plan for the City of Livermore was adopted on February 9, 2004 and spans the duration from 2003 through 2025.
- City of Livermore General Plan EIR: Livermore Draft General Plan and Downtown Specific Plan EIR (SCH # 2003032038), Volume II: Impacts and Mitigation Measures, was prepared in June 2003. The cumulative impacts analysis in this EIR uses the summary of projections based on information from the traffic analysis in the EIR.
- Alameda County General Plan: This analysis uses the East County Area Plan (ECAP) that was adopted on May 5, 1994 with recent amendment in November 2000. The resulting modifications were adopted in May 2002.
- Alameda County General Plan EIR: The 1993 East County Area Plan EIR is the most recent EIR available. The General Plan discussed in the EIR establishes holding capacities for 2010 and build out for the entire East County inclusive of incorporated and unincorporated areas. The SMMP project area includes only the unincorporated areas of the county.
- South Bay Aqueduct Project EIR: The EIR (SCH # 2003092084) for the South Bay Aqueduct (SBA) project was certified in December 2004. The project includes installation of new siphon crossings on Arroyo Seco and Arroyo Mocho.
- CIP Information: Information on CIP projects was obtained by contacting the individual cities and Alameda County.
- Specific Plan for Livermore-Amador Valley Quarry Area Reclamation (Alameda County, 1981): The Specific Plan includes staging plans and charts depicting land and water configurations in the Quarry Area for the years 1995, 2010, and 2030. The Specific Plan

was adopted on November 5, 1981. The key concept of the Specific Plan, the Chain of Lakes would provide a surface water storage and conveyance system to replace a portion of the pre-existing subsurface water storage and conveyance system feeding the groundwater basin. At the conclusion of mining, water from Arroyo del Valle would be capable of diversion into the chain of lakes, and a by-pass channel for that watercourse would also be provided to maintain downstream flows necessary to Zone 7 and Alameda County Water District. Diversion from Arroyo Mocho into Lakes H and I was identified as the earliest phase of the Chain of Lakes concept, and Zone 7 has completed CEQA analysis of the Arroyo Mocho Diversion Structure (Zone 7, 2004).

The four projects relevant to the cumulative impact analysis for the SMMP are briefly summarized below:

- Bernal Property Specific Plan: Mixed use development in Pleasanton including residential, commercial, and recreational use.
- Dublin Area Transit Center/Transit Oriented Development (TOD): High intensity mixed-use development in close proximity to BART station in Dublin and the bus transfer station.
- Dougherty Valley: Residential development in San Ramon Valley.
- East Dublin General Plan Amendment and Specific Plan: Mixed use development in Dublin.

In addition to incorporating information from the above documents, this analysis is also based on construction and operation impacts that are discussed in **Chapter 3, Environmental Setting, Impacts, and Mitigation Measures**. The potential for the impacts to contribute to significant cumulative impacts would depend upon the geographic area and the timing of SMMP and the other projects. Although the timing of the projects is likely to fluctuate due to schedule changes or other unknown factors, this analysis assumes that the regional projected development (as stated in the general plans and CIPs) would occur concurrently with the SMMP.

5.2.2 Municipal Capital Improvement Programs

In order to review other projects that would have the potential to directly affect stream channels, instream biology, or conveyance hydrology beyond the SMMP, municipal CIPs within the Zone 7 service area were reviewed. **Table 5-1** lists the projects within the CIPs of Dublin, Pleasanton, Livermore, and Alameda County that include flood control or storm drain improvements. As part of SMMP development and stakeholder outreach, projects similar to major CIP projects affecting regional conveyance facilities have been integrated into the SMMP, and may be implemented by Zone 7 or individual agencies, as appropriate. These projects are identified in **Table 5-1**. Therefore, additional projects or programs currently proposed that would directly affect stream channels within the SMMP project area are limited primarily to storm drain improvement programs and maintenance programs proposed by individual municipalities. The projects scheduled to be implemented beyond 2006 would be applicable to the cumulative impact analysis.

**TABLE 5-1
PROJECTS UNDER THE CIPs IN THE SMMP PROJECT AREA**

Agency	Time Frame	Budget	Projects	Incorporated Into SMMP ^a
City of Livermore	2004–2006	\$89,503,960	Summary of CIP projects for Livermore <i>Next 2 years:</i> - Resolve flooding along Stanley Blvd - Fourth St. - Address bank erosion on Arroyo Mocho. - Upgrade storm drain trunk lines in the downtown area. <i>Future years:</i> - Maintain and improve Arroyo Las Positas and Arroyo Mocho.	Yes Yes No Yes
		\$560,000	Arroyo Las Positas Storm Channel Improvement: - Improve stormwater channel from Kitty Hawk Rd to Airway Blvd. - Desilt the channel along this reach and desilt the city culverts at Airway Blvd and Kitty Hawk Rd.	Yes Yes
		\$155,900	Arroyo Las Positas Stream Management Plan: - Stream from east of Airway Blvd to El Charro Rd - Identify and prioritize needed improvements to the Arroyo Las Positas in the stretch from east of Airway Blvd. to El Charro Rd. - May involve construction of an upstream desilting basin.	Yes Yes Yes
		\$453,000	Arroyo Mocho Access Bridge Crossing: Construct a pre-fabricated bridge over Arroyo Mocho near the intersection of Stanley Blvd. and Murrieta Blvd.	Yes
		\$271,460	Arroyo Mocho Bank Stabilization: Stabilize/protect 300 feet of eroded bank on the Arroyo Mocho adjacent to the City's Maintenance Service Center facility.	Yes
		\$4,046,600	Arroyo Mocho Stream Management Plan: - Identify and prioritize improvements needed to the Arroyo Mocho stream (Wente St. to Stanley Blvd). - May involve construction of a desilting basin along this reach.	Yes Yes
	Phase 1: FY 03–04 FY 04–05	\$545,000	Las Positas Channel Improvement and Bike Trail/Crossing: - Improve Las Positas Channel from Altamont Creek to Heather Lane. - Improve bike trail from Springtown Blvd to Bluebell Drive. - Phase 1 will improve existing bike trail from Springtown Blvd to Bluebell Drive. - Phase 2 will remove the culvert crossing which is a part of the bike/pedestrian trail and install a pre-fabricated vehicular bridge crossing. - Phase 3 will improve the Las Positas Channel from Altamont Creek to Bluebell Drive. - Phase 4 will improve the channel from Bluebell Drive to Heather Lane.	Yes Yes Yes Yes Yes Yes
	Phase 2: FY 05–06			
	Phase 3–4 Beyond 2006.			
		\$200,000	Stream Channel Master Plans—Citywide: Develop a comprehensive creek and watershed master plan that will satisfy new water quality permit requirements and aid in floodplain management in the city.	No

TABLE 5-1 (continued)
PROJECTS UNDER THE CIPs IN THE SMMP PROJECT AREA

Agency	Time Frame	Budget	Projects	Incorporated Into SMMP ^a
City of Livermore (cont.)	FY 04-05	\$600,000	Major Storm Drain Trunk line Upgrades	No
	Beyond 08	\$76,700,000		
	FY 04-05	\$422,000	Storm Drain Improvements- Holmes/Stanley	No
	FY 07-08	\$1,350,000		
City of Pleasanton	Beyond 08	\$4,200,000		
	FY 04-05	\$90,000	Storm Lift Station Design Improvements	No
	FY 04-05	\$50,000	Annual Water Quality Improvement Project	No
	FY 05-06	\$50,000		
	FY 06-07	\$50,000		
	FY 05-06	\$385,000	Annual Water Replacement Projects	No
	FY 05-06	\$385,000		
	FY 04-05	\$300,000	Annual Sanitary Sewer Main Replacement and Improvements	No
	FY 05-06	\$325,000		
	FY 06-07	\$300,000		
	FY 04-05	\$20,000	Annual Sewer Maintenance Hole Improvements	No
	FY 05-06	\$20,000		
	FY 06-07	\$20,000		
		Partly funded by CIP	Bernal Creek Restoration Project: • First and Second phases located east of the freeway starting this summer (south of Valley Avenue). • Construction would continue through April 15th, 2005.	No
Alameda County			Potential flood control projects on Alameda Creek	Yes

NOTES: FY = Fiscal Year Rd = Road
Blvd = Boulevard St = Street

^a Incorporated into SMMP indicates that the projects are included as a part of SMMP.

SOURCES: City of Livermore, 2004; City of Pleasanton, 2004; City of Livermore, 2005; City of Pleasanton, 2005; Alameda County, 2005.

5.2.3 Other Regional Hydrologic or Biological Resource Management Programs

Regional projects that affect regional hydrology or biological resource management within the Alameda Creek watershed are also considered in this analysis, to the degree that such analysis is feasible within the context of this EIR. In general, these projects have the potential to contribute incrementally to cumulative effects in the following categories: 1) constructed related impacts, such as noise, air quality, traffic and water quality impacts; 2) long term alteration to in-stream flow regime; 3) impacts to bank stability, sedimentation and water quality; 4) direct or indirect impact to sensitive species; 5) impacts to cultural resources; and 6) beneficial impacts to regional ecology or habitat through restoration, primarily for steelhead. These projects are summarized below:

- Del Valle Reservoir Flood Control Operations.* Storm flow on Arroyo Del Valle is currently regulated by Del Valle Reservoir, which is owned and operated by the Department of Water Resources (DWR). The reservoir is operated for three primary purposes: flood control on Arroyo Del Valle; regulation of flows and deliveries to the three SBA Contractors; and recreational use. Total gross storage capacity at the spillway crest of Del Valle Dam is 77,000 acre-feet (af). Approximately 39,000 af of storage is reserved for flood control purposes, with about 30,000 af allocated for regulation and storage of SBA water supplies. Flood regulation procedures are established for Del Valle Reservoir by the U.S. Army Corps of Engineers (Corps) in the *Report of Reservoir Regulation, Del Valle Dam and Reservoir Alameda Creek, California* (October, 1978). The hydrograph for Del Valle Reservoir and the conditions under which flood flow releases would occur, is an important cumulative issue relative to the storage capacity and operational scheme at the proposed Chain of Lakes. If releases from these two facilities coincide, water surface elevations on Arroyo de la Laguna may be increased, resulting in the inability of that channel to convey flows associated with a 100-year flood event.
- Sunol-Niles Dam Removal.* The San Francisco Public Utilities Commission (SFPUC) is proposing to partially remove Sunol and Niles Dams, which are located in the Niles Canyon reach of Alameda Creek in Alameda County. In association with removal of the dams, impounded sediment would be left in place to move downstream naturally over a period of several decades. Project objectives include: 1) Remove barriers to fish passage in keeping with the Alameda Creek Fisheries Restoration Workgroup goal of restoring a self-sustaining population of steelhead to the Alameda Creek watershed, while recognizing other beneficial uses (e.g., water supply and flood control); 2) Reduce or eliminate an existing public safety hazard and related SFPUC risk management concerns; 3) Perform dam removal in an environmentally sensitive manner. Removal of the dams is proposed to occur between May and November of 2006.
- Calaveras Dam Replacement.* This project would affect creek hydrology and habitat, special status species, and cultural resources but would occur several years after removal of Sunol and Niles dams. There would be a beneficial effect on fisheries through release of instream flows.
- Alameda Creek Fishery Enhancement.* This project would contribute cumulatively considerable beneficial effect to restoration of Alameda Creek fisheries habitat by establishing a watered reach for native fish.
- Sunol Quarry Reservoir.* Construction of pipelines associated with conversion of six Sunol quarry pits to water storage reservoirs could directly impact Alameda Creek or its tributaries.
- Alameda Creek Restoration.* A number of future stream restoration plans are included in the Draft Habitat Conservation Plan (HCP) for the SFPUC Alameda Watershed Management Plan. Projects involve bioengineering for bank stabilization, channel realignment to increase sinuosity and restore historic gradient, and revegetation to restore floodplain habitat in a number of locations along Alameda Creek. The projects would contribute a cumulatively considerable beneficial impact to restoration of Alameda Creek fisheries habitat.
- Irvington Tunnel Alternatives/Alameda Siphons.* Pipelines connecting the tunnel portals would cross Alameda Creek resulting in temporary stream-related impacts.

- U.S. Army Corps of Engineers, Section 1135 Projects. This suite of projects includes removing fish migration barriers and screening water diversions in the lower flood control channel reach of Alameda Creek. Projects would contribute cumulatively considerable beneficial effects to restoration of Alameda Creek fisheries habitat when combined with removal of the Sunol and Niles dams.
- U.S. Army Corps of Engineers, Arroyo de la Laguna Flood Control and Restoration. Studies to establish a federal interest in solutions to potential flooding and associated damage to surrounding riparian habitat in Arroyo de la Laguna. Studies are not currently funded but have the potential to contribute cumulatively considerable benefit to fisheries habitat through restoration of riparian habitat and reduction of flood-induced sedimentation. This project represents a funding opportunity for SMMP improvements on Arroyo de la Laguna, and does not represent a separate project; any improvements to ADLL would be coordinated between the two agencies.
- Caltrans State Route 84 (SR 84) Safety Project. On Niles Canyon Road (SR 84), Caltrans proposes to widen existing shoulders, improve site distance and vertical clearances at the two bridges, provide a northbound left-turn pocket at Palomares Road and relocate the intersection approximately 80 feet to the south. A 1,075-foot long retaining wall would be built next to Alameda Creek starting 59 feet north of Niles Dam. The existing box culvert at Stonybrook Creek would be replaced with a new structure that would facilitate fish passage from Alameda Creek to Stonybrook Creek. Temporary 16-foot wide earth-fill work benches would be built next to Alameda Creek. The project would contribute cumulatively considerable beneficial effect to restoration of Alameda Creek fisheries habitat by removing a barrier to fish passage at the confluence of Stonybrook Creek and Alameda Creek.
- Alameda Watershed Management Plan and HCP. The SFPUC manages the Alameda watershed lands in accordance with policies and practices in the Watershed Management Plan and mitigation measures in the adopted Plan EIR. The SFPUC is currently drafting an HCP to cover Watershed management activities and selected CIP that potentially affect listed species. Covered management activities and CIP projects include: road and bridge maintenance and construction, vegetation management, pond spillway repair, recreation activity improvements, reservoir operations and maintenance, prescribed burns, reservoir, shoreline protection and restoration, water transmission and filtration system operations and maintenance, and golf course operations and maintenance.

5.2.4 Geographic Scope

The potential for project-generated impacts to contribute to a significant cumulative impact would arise if they are located within the same geographic area. This geographic area may vary, depending upon the resource area discussed, i.e., water quality, noise, etc., and the geographic extent of the potential impact. For example the geographic area associated with construction noise impacts would be limited to areas directly affected by construction noise, whereas the geographic area that could be affected by construction related air emissions may include the larger air shed. Construction impacts associated with increased noise, dust, erosion, and access limitations tend to be localized and could be exacerbated if other development or improvement projects occur within the same or adjacent locations as the individual projects proposed under the SMMP. The geographic scope for short-term impacts generally covers the SMMP project area, including the cities of Dublin, Pleasanton, and Livermore and unincorporated areas of Alameda County, and

takes into account local development and municipal capital improvements. The geographic scope for long-term impacts to hydrology, sediment management, fisheries, and biological resources include local impacts within the SMMP project area in addition to the SMMP's potential contribution to impacts within the larger watershed for these issue areas.

5.2.5 Project Timing

In addition to the geographic scope, cumulative impacts are determined by timing of the other projects relative to the proposed project. Schedule is particularly important for construction-related impacts. For a group of projects to generate cumulative construction impacts, they must be temporally as well as spatially proximate, i.e., close in time and location. The projected development and improvements described later in this chapter may or may not occur simultaneously with implementation of the SMMP, depending upon the schedule of each individual project. As stated previously, individual projects would be developed for implementation through the course of the current planning horizon for the general plans (i.e., 2020-2030). Although the timing of the projects is likely to fluctuate due to schedule changes or other unknown factors, this analysis assumes that the SMMP would be implemented concurrently with the projected development or improvement in the area.

5.3 Cumulative Effects

This chapter reviews the potential cumulative effects of implementing the SMMP concurrently with projects that may occur within the same timeframe. As previously discussed, potential projects include development under the approved General Plans within the Zone 7 service area, and municipal CIPs that directly affect stream channels, and other regional projects that affect regional hydrology or biological resources management. Additionally, the geographic scope of potential cumulative impacts varies by issue area, and is defined for each issue area.

5.3.1 Construction-Related Impacts

Impact 5.1: Concurrent construction of development under the approved General Plans and municipal CIPs could result in cumulative short-term impacts associated with construction activities. These include short-term impacts to water quality, air quality, noise, traffic, hazardous materials, visual resources, and effects to surrounding land uses. In some areas, these impacts, while individually short term in nature, would be potentially significant due to their aggregate effect; however, construction-related impacts would not result in long-term alteration of the environment. Less than Significant.

In general, the SMMP would provide adequate flood protection in the channels in the project area through implementation of regional storage, sediment removal, low-flow channel installation, wetland creation, and riparian corridor enhancement to provide bank stabilization. Projects implemented under SMMP would develop regional storage at the existing Lake G and Cope Lake, and would implement one-time sediment removal on a project-by-project basis to reestablish channel capacity for approximately 19,000 linear feet of channel. Other channel capacity improvements would include use of flood walls along the top of existing embankments,

channel widening, and removal of in-channel maintenance roads to improve channel capacity. SMMP implementation would also include the following riparian and habitat enhancements to existing stream channels: establishment of 40,000 linear feet of low-flow channel, implementation of riparian planting and vegetation management along 76,300 linear feet of channel bank, and application of invasive species control along 21,000 linear feet of channel bank. To more effectively manage sediment deposition and removal, the SMMP includes establishment of 6 sediment basins, and includes implementation of bio-technical bank stabilization along approximately 61,500 linear feet of channel bank to reduce bank failure and erosion. The SMMP includes creation of 28 acres of in-stream and off-channel wetlands, dedication of 22 acres for habitat conservation, and dedication of 146 acres of land for floodplain management. The SMMP would remove 10 existing fish barriers within the Upper Alameda Watershed, and would create 36.7 miles of multi-use recreational trail along existing stream channels.

Water Quality

General Plan and Municipal CIP Impacts

The Dublin General Plan EIR (1984), the City of Livermore General Plan EIR (2003), the City of Pleasanton General Plan, and the Alameda County ECAP identify potential impacts associated with erosion and sedimentation. However, the analyses indicate that surface and groundwater quality would not be significantly affected if erosion and siltation controls are implemented. It is estimated that approximately 75 square miles (48,000 acres) of Livermore Valley would be affected by proposed development accounted for in the general plans. Additionally, implementation of municipal CIP projects could result in downstream sedimentation associated with in-channel construction.

SMMP Contribution

SMMP implementation would include in-channel construction to implement individual facilities. Concurrent construction of development under the approved General Plans with individual SMMP projects could result in increased erosion and subsequent sedimentation, with impacts to water quality in downstream water bodies and/or storm drain capacity. Additionally, discharge of groundwater, release of fuels, or release of other hazardous materials associated with construction activities could degrade water quality.

The State Water Resources Control Board has issued a General Construction Permit to address potential impacts related to construction activities. The General Permit ensures that individual projects implement their fair share of mitigation measures designed to alleviate cumulative impacts to water quality. The General Permit mandates that projects disturbing greater than one acre develop and implement a Storm Water Pollution Prevention Plan (SWPPP) identifying best management practices (BMPs) to reduce erosion of disturbed soils and release of hazardous materials into water courses. Preparation of the SWPPP and compliance with the measures identified in the SWPPP would ensure compliance with state regulatory policies to minimize the potential for water quality impacts from construction activities associated with the proposed

project. As such, the potential contribution to water quality impacts associated with individual projects implemented under the SMMP would be rendered less than cumulatively considerable through implementation of **Mitigation Measure 3.2-1a**.

Air Quality

General Plan and Municipal CIP Effects

General Plan development and implementation of municipal CIPs would contribute to impacts to air quality. Air quality impacts identified in the Dublin General Plan EIR (1984) are projected to result almost exclusively from increased automobile travel. The significance of the Dublin General Plan's impact on air quality stems from the effect of designated land uses on activities that generate air pollutants. Within the city limits, increased traffic resulting in unacceptable level-of-service (LOS) may result in localized carbon monoxide "hot spots" (City of Dublin, 1984). New development as discussed in the Pleasanton General Plan EIR (1996b) would not cause significant adverse impacts to the air quality. Construction activities would cause localized air quality impacts that would be reduced to a less-than-significant level by implementing the policies and programs listed in the general plan (City of Pleasanton, 1996b). Even with the implementation of mitigation measures and development of transit oriented communities and low emission technologies, impacts to air quality in the region are expected to worsen due to increased development in the Tri-Valley region. Similar impacts are considered significant and could result in substantial adverse human health effects in the Livermore General Plan EIR (City of Livermore, 2003).

Projections in the Alameda County General Plan show an improving trend with overall emissions increasing in the future, despite cumulative growth in population and vehicle use. The improving trend would be due to the regional programs in place or being considered for reducing emissions (Alameda County, 1993).

SMMP Contribution

Concurrent construction of individual SMMP projects with development and municipal CIPs in the Livermore Valley would generate short-term emissions of criteria pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions. As discussed in **Section 3.7 Air Quality**, the BAAQMD recommends that significance of construction-related dust impacts be based on the control measures that would be implemented onsite. If appropriate mitigation measures are implemented to control PM10 emissions, then the impact would be less-than-significant. *BAAQMD Guidelines* contain a list of feasible control measures for construction-related PM10 emissions. The BAAQMD Guidelines also indicate that construction-related emissions of criteria pollutants are accounted for in the emission inventory that is the basis for regional air quality plans; thus, construction-related emissions are not expected to impede attainment or maintenance of ozone or carbon monoxide standards in the Bay Area. As such, the potential contribution of SMMP to air quality impacts would be rendered less than cumulatively considerable through implementation of these measures, as required in **Mitigation Measures 3.7-1a through 3.7-1c**.

Noise

General Plan and Municipal CIP Effects

General Plan development and implementation of municipal CIPs would contribute to impacts to noise. The Dublin General Plan EIR (1984) did not identify noise as a significant impact, but recommended the use of noise barriers as effective tools (City of Dublin, 1984). The City of Pleasanton General Plan EIR (1996a) identifies a significant increase in the noise levels along some roadway segments. However programs listed in the General Plan (1996a) would reduce the potential noise impacts from traffic or new development to a less-than-significant level. Implementation of the Livermore General Plan and anticipated future projects would result in significant unavoidable increases in noise on area roadways. Construction activities would be subject to standard noise reduction measures and would not adversely impact sensitive receptors (City of Livermore, 2003).

Cumulative noise impacts analysis for Alameda County focuses on traffic noise sources along all of the major transportation corridors through the ECAP. The noise contours projected for 2010 substantially expand the 60-dB contour on both sides of I-580 and I-680. Construction activity in the county ECAP area may result in temporary elevated noise levels that could affect nearby residences. Noise from construction such as from ground clearing, earth moving, and pile driving may generate noise levels up to 90 dBA at a distance of 50 feet (Alameda County, 1993). The general plan EIR for the county does not indicate the significance level of construction noise, however the plan states that the impacts would be short term.

SMMP Contribution

Noise impacts from SMMP implementation would be primarily associated with construction and would be short term. As stated in **Chapter 2, Project Description**, SMMP construction would not involve pile driving, which is the noisiest construction activity. As discussed in **Section 3.8, Noise**, the highest noise level generated by the construction equipment would be approximately 75 to 89 Leq at 50 feet, assuming no noise mitigation features.

Concurrent construction of the SMMP in the project area would temporarily generate noise associated with construction equipment and construction traffic. Projects located closer to the sensitive receptors such as residences, hospitals, and schools would have higher potential to contribute directly to temporary disturbance. The local noise ordinances establish allowable time periods for construction activities to address the issue of short-term construction noise. Compliance with the local regulations and mitigation as listed in **Section 3.8, Noise**, would reduce SMMP's contribution to short-term noise impacts to less than cumulatively considerable.

Traffic

General Plan and Municipal CIP Effects

General Plan development and implementation of municipal CIPs would contribute to impacts to traffic. Projected cumulative impact discussion in the Dublin General Plan EIR (1984) described

impacts resulting from the build out of the general plan. Build out under the general plan would result in unacceptable LOS at two intersections in Dublin and increased traffic volumes throughout Dublin. This impact would be significant and unavoidable despite mitigation (City of Dublin, 1984).

The 1996 Pleasanton General Plan Update includes development and a series of local and subregional transportation improvements designed to accommodate traffic volumes. Future development resulting from the general plan build out would result in new roads and intersections and additional traffic. Future traffic levels associated with the general plan development could result in unacceptable LOS at several intersections (City of Pleasanton, 1996b).

Implementation of the Livermore General Plan would cause significant impacts (exceed mid-LOS threshold) at intersections and roadway segments in Livermore by 2025 despite mitigation. The impacts therefore would be significant and unavoidable (City of Livermore, 2003).

The traffic impact analysis in Alameda County was developed for the general plan's 2010 holding capacity based on traffic model runs using the Tri-Valley Transportation Model (TVTM) and ECAP land uses for 2010. The LOS for Isabel Avenue, Vallecitos Road, Stanley Boulevard, Tassajara Road, and Vasco Road that are a part of the SMMP is predicted to be LOS F by 2010. Mitigation would reduce the LOS to LOS D or better (Alameda County, 1993).

SMMP Contribution

As discussed in **Section 3.9, Traffic and Circulation**, traffic impacts associated with the SMMP would not be significant and would result only from construction activities that would be temporary and short term. The primary impacts from construction traffic would include a temporary and intermittent reduction of roadway capacities on the two-lane roadways serving the construction sites, due to the slower movements and larger turning radii of the trucks compared to passenger vehicles. As noted in **Section 3.9, Traffic and Circulation**, construction-related truck traffic occurring on weekdays during the hours of 7:00 a.m. to 9:00 a.m. and 3:00 p.m. to 5:00 p.m. would coincide with peak-period traffic volumes on area roadways, and would have the greatest potential to impede traffic flow. However, project-generated truck trips would take different routes depending on the location of each day's work site, and project traffic would be dispersed throughout the eight-hour work day, lessening the effect on traffic conditions in any one hour. Therefore, the short-term increase in vehicle trips would not significantly affect LOS and traffic flow on area roadways, and this construction related traffic would not be considered significant on an individual project basis. Therefore, the SMMP contribution to short-term and long-term traffic impacts would be less than cumulatively considerable.

Hazardous Materials

General Plan and Municipal CIP Effects

The Dublin General Plan EIR (1984) includes no discussion of hazardous materials impacts.

Residential development in areas that have been adversely affected by hazardous materials in conjunction with past or present land uses could expose people to contaminants; industrial activities that use hazardous materials would expose workers and residents to those substances. Increased development within Pleasanton could increase the generation, handling, storage, and disposal of hazardous materials. However with implementation of public health and safety programs, potential impacts related to the management of hazardous materials would be less-than-significant (City of Pleasanton, 1996b).

Increase in population from implementation of the Livermore General Plan and cumulative projects would result in increased use and storage of hazardous household, commercial, and industrial materials. This would thus increase the risks of exposure to accidental upsets of hazardous materials. However, handling of hazardous materials in accordance with the local, state, and federal regulations would reduce the cumulative risks to a less-than-significant level (City of Livermore, 2003).

The Alameda County General Plan EIR (1993) discusses general plan implementation impacts on solid and hazardous waste management, which is not directly associated with SMMP.

SMMP Contribution

Potential impacts related to hazardous materials use would occur during SMMP construction. Concurrent construction of SMMP projects with projected development in the project area could cause an increase in the risk of exposure (human and the environment) to hazardous materials from the potential discovery of contaminated material during excavation and the use of construction related hazardous materials, such as gasoline, oils, and solvents. However implementation of public safety programs and policies and compliance with standard safety regulations would reduce the SMMP contribution to a less than cumulatively considerable level.

Utilities

General Plan Development

Projected cumulative impact discussion in the Dublin General Plan EIR (1984) described impacts resulting from the build out of the general plan. According to the EIR, sewage treatment and disposal and water supply are the two utility issues of greatest concern in the Dublin planning area. Given the extent of planned development outside of Dublin's planning area, the general plan implementation would not have a significant impact on sewage disposal capacity. Mitigation listed in the EIR is financial participation in expansion of the systems (City of Dublin, 1984).

Additional development in Pleasanton could change the effectiveness of the existing Emergency Operations Plan by introducing new structures and population into the affected area. With the implementation of the policies in the general plan, the potential impacts on emergency response operations are considered less-than-significant. Impacts to water, wastewater, and storm drainage facilities, and groundwater resources resulting from new development would be less-than-significant. Solid waste from new development would contribute to the need for new landfill sites. Pleasanton's existing contract with the Pleasanton Garbage Service requires the service to

maintain a contract with a landfill operator. This contract extends through the year 2019. Implementation of the Public Facilities Element under the general plan would reduce potential solid waste impacts to a less-than-significant level (City of Pleasanton, 1996b).

Projected development in the Livermore General Plan and the cumulative projects would increase the demand for water, wastewater treatment, and energy on a regional level. Because the supply of water is limited, this increase in demand would be accomplished through reallocation of water from other land uses that require water, such as agriculture and fisheries. The reallocation of water from such uses to development in the greater Bay Area would result in indirect environmental effects and would be considered significant (City of Livermore, 2003).

Discussion for utilities in the Alameda County General Plan EIR (1993) includes water supply and energy. According to the EIR, cumulative water supply impacts in the county would result from increased competition for limited state supplies. Increased pressure for new sources of water and higher prices would place new pressures on groundwater basins throughout the state. The EIR identifies the water demand for cumulative urban development to be a significant impact, however this impact seems to be not associated with construction or CIP projects such as the SMMP.

SMMP Contribution

For all projects including the SMMP, construction activities could result in temporary, planned or accidental disruption to utility services, and require short-term police and fire protection services to assist in traffic management or in the event of an accident. These impacts would be mitigated by regulatory compliance as discussed in **Section 3.11, Utilities**. As the SMMP does not propose residential or commercial development, demand for utility or emergency services would be minimal. As such, the SMMP impact to utilities and public services would be less than cumulatively considerable.

Mitigation Measures

No additional mitigation measures beyond those identified in Chapter 3.

Impact Significance after Mitigation: Short-Term, Less than Significant.

5.3.2 Long-Term Impacts

Long term impacts related to the SMMP would be associated with changes to stream channel hydrology and sediment transport, effects to biological resources and fisheries habitat, and effects to geology and soils, land use, cultural resources, and visual resources. In addition to these long-term effects, implementation of maintenance activities described in **Chapter 2, Project Description**, would also potentially contribute to long term impacts. Activities would include sediment removal, bank stabilization, vegetation removal, bikeways and trails repair, wetland and off-stream seasonal pond maintenance, minor maintenance, and maintenance of flood control structures and equipment. A plan of maintenance activities would be developed annually, with projected work based on historical needs, field inspections, and comments from the public. Operational impacts would be minimal because the number of vehicular trips generated from the routine maintenance activities would be negligible. Work orders would be developed and would include appropriate BMPs and permit requirements such as site surveys to identify the occurrence of special-status plant and wildlife species. All affected parties would be notified prior to commencement of maintenance activities.

Impact 5.2: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to water resources, water quality, and flooding impacts associated with alteration of drainage patterns and increases in impervious surface areas. Less than Significant.

General Plan and Municipal CIP Effects

Implementation of the SMMP concurrent with development under the General Plans within the Livermore Valley would have the potential to contribute to water resource, water quality, and flooding impacts due to alterations of drainage patterns and increases in impervious surface areas. As noted in **Section 3.2, Hydrology**, projected buildout under the approved General Plans within the SMMP project area, and assuming that channels are improved to Green Book standards, are anticipated to result in flows of approximately 25,500 cfs at ADLL.

Other Regional Flood Management Programs

The Alameda Creek Watershed encompasses approximately 630 square miles (403,200 acres) and includes areas of Alameda, Contra Costa, and Santa Clara Counties, and includes the Altamont Creek sub-watershed. Other regional hydrologic or biological resources management programs identified in Section 5.2.3 are located downstream of the SMMP project area, with the exception of Del Valle Reservoir flood control operations. The consistent objective of these programs is to manage flood flows and to improve biological resource habitat within the Alameda Creek Watershed, primarily for steelhead. Implementation of individual projects may contribute increased stream flows during storm events, or alter stream channel such that water surface elevations are affected. Implementation of these individual projects would require analysis to demonstrate that downstream areas are not adversely affected.

SMMP Contribution

The SMMP has been developed to provide a multi-resource enhancement within the context of providing regional flood protection to the Livermore Valley. Implementation of the SMMP includes provision of approximately 5,000 acre-feet of storage. This would alter the current hydrograph along Arroyo Mocho and ADLL, delaying the release of detained flows until after the peak flow periods. This would assist in maintaining flows in Arroyo Mocho and ADLL at levels that can be contained by the design capacity of these facilities. As such, project implementation would provide a benefit to flooding impacts within the Livermore Valley.

Depending upon the operations plan for the Chain of Lakes, the delayed hydrograph could overlap with release patterns from other facilities in the watershed, primarily Del Valle Reservoir. Flood regulation procedures are established for Del Valle Reservoir by the Corps in the *Report of Reservoir Regulation, Del Valle Dam and Reservoir Alameda Creek, California (October, 1978)*. The hydrograph for Del Valle Reservoir and the conditions under which flood flow releases would occur, is an important cumulative issue relative to the storage capacity and operational scheme at the proposed Chain of Lakes. Release rates from Cope Lake are anticipated to be approximately 1,000 cfs, and flows downstream in Arroyo Mocho would be maintained below 5,000 cfs, to limit flows in ADLL downstream of Arroyo del Valle to the identified channel capacity (18,730 cfs). Therefore, release rates are not anticipated to affect downstream areas. However, water surface elevations on Arroyo de la Laguna downstream of Arroyo del Valle could be slightly increased by this release rate, particularly if high flows are released from Del Valle Reservoir following major storm events in order to maintain storage capacity at that facility.

Mitigation Measures

Measure 5.2.1a. Chain of Lakes Operations Plan. Development of Chain of Lakes projects R.5-3, R.6-1, and R.6-2 shall include the review of regional facility hydrographs and operations plans to account for cumulative flow conditions within the SMMP project area. The timing of Chain of Lakes releases shall be reviewed to ensure that they are coordinated with Del Valle Reservoir releases to avoid adverse effects to channel capacity downstream of the confluence of ADLL and Arroyo del Valle.

Impact 5.3: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to sediment transport. Less than Significant.

As previously discussed in **Section 3.2, Hydrology and Water Quality**, the sediment balance analysis conducted as part of the SMMP considered future conditions with buildout under approved General Plans within the SMMP project area. Results of that analysis indicate that the suspended sediment load carried by the channels to Alameda Creek would be slightly reduced, as

development under the General Plans reduced the amount of erodible acreage within the Livermore Valley.

Other Regional Flood Management Programs

Other regional hydrologic or biological resources management programs identified in Section 5.2.3 are located downstream of the SMMP project area, with the exception of Del Valle Reservoir flood control operations. The consistent objective of these programs is to manage flood flows and to improve biological resource habitat within the Alameda Creek Watershed, primarily for steelhead. It is likely that implementation of these projects would contribute additional sediment to the Alameda Creek Watershed; however, in the context of the sediment transport that is occurring within the watershed, the contribution of these projects is not anticipated to be considerable. Several projects would be anticipated to improve sediment transport and management within the watershed through implementation of habitat enhancement and dam removal.

SMMP Contribution

With implementation of the SMMP, localized sediment deposition within the existing 100-year floodplain in the vicinity of the Chain of Lakes would be contained within Cope Lake; no substantial alteration in sediment yield from ADLL to Alameda Creek would occur. Therefore, the SMMP contribution to regional sedimentation is not cumulatively considerable. Furthermore, the wash load sequestered in the Chain of Lakes is not available for remobilization by future storm flows, and thus this is a beneficial impact in terms of water quality.

Mitigation Measures

No mitigation measures required.

Impact 5.4: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to wetland and vernal pool habitats, with secondary effects to special-status species, including burrowing owl, California red-legged frog, California tiger salamander, fairy shrimp, pond turtle, and nesting sensitive birds. Less than Significant with Mitigation.

General Plan and Municipal CIP Impacts

General Plan development and implementation of municipal CIPs would contribute to impacts to biological resources. Projected cumulative impact discussion in the Dublin General Plan EIR (1984) described impacts resulting from the build out of the general plan. The most unusual and valuable habitat in the Dublin planning area is the area to the west of the city of Dublin, which forms part of the ridgelands stretching from Santa Clara to Contra Costa counties. No endangered species or rare habitats have been identified in the planning area. The grasslands of the eastern

planning area in Dublin are comparatively less distinctive habitats and the impacts of general plan implementation would be less-than-significant (City of Dublin, 1984).

The 1996 Pleasanton General Plan EIR lists the cumulative impacts to biological resources such as impacts to wetlands and riparian habitat to be less-than-significant (City of Pleasanton, 1996b).

Implementation of the Livermore General Plan and cumulative projects would result in impacts to sensitive biological resources including vernal pools, wetlands, and oak woodland that would be reduced by adopting general plan policies. However the general plan and cumulative projects would cumulatively result in impacts to biological resources and loss of wildlife habitat. The cumulative biological impacts, despite mitigation would therefore be significant (City of Livermore, 2003).

Anticipated cumulative development in the Tri-Valley area would result in loss of about 75 square miles of plant and wildlife habitat in Alameda County. Cumulative conversion of this land may have a significant impact on special-status taxa, sensitive natural communities, and other important biotic features. The significance of potential impacts of cumulative development would depend on the resources associated with specific development sites and the extent to which important resources are protected and enhanced (Alameda County, 1993).

Other Regional Flood Management Programs

Other regional hydrologic or biological resources management programs identified in Section 5.2.3 are located downstream of the SMMP project area, with the exception of Del Valle Reservoir flood control operations. The consistent objective of these programs is to manage flood flows and to improve biological resource habitat within the Alameda Creek Watershed, primarily for steelhead. However, implementation of these projects would include impacts to aquatic and riparian habitat, potential injury or mortality to special status aquatic species, potential disruption of nesting birds, raptors and bats, and potential loss of special status species plant habitat. These projects would be required through both CEQA and permitting processes to include measures to minimize, avoid, or mitigate for these impacts, to the degree feasible.

SMMP Contribution

Implementation of the SMMP would contribute to the temporary or permanent loss of wetland habitat within stream channels, including potential habitat for the following sensitive species: California red-legged frog, California tiger salamander, pond turtle, and burrowing owl. Implementation of individual SMMP projects would include the requirement of compensatory mitigation at ratios established by regulatory agencies, and potential impacts may be reduced to less than significant on a project-by-project basis by mitigation measures established in **Section 3.5, Biological Resources**. As identified in **Chapter 2.0, Project Description**, the SMMP provides for approximately 28 acres of wetland creation, as well as several stream channel enhancements, such as bank revegetation and restoration. However, due to the stream-channel acreage affected by the projects proposed under the SMMP, including the loss of habitat associated with channel lining, this impact is considered cumulatively considerable, and until

such time as demonstrated by project-specific analysis of impacts and compensatory mitigation, would remain significant and unavoidable.

Mitigation Measures

Measure 5.4: Implement Mitigation Measures contained in **Section 3.5, Biological Resources**.

Impact Significance after Mitigation: Significant and Unavoidable at the MEIR Level

Impact 5.5: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to habitat for central coast steelhead. Less than Significant with Mitigation.

General Plan and Municipal CIP Effects

General Plan development and implementation of municipal CIPs would contribute to impacts to fisheries. General Plans for Livermore, Dublin, Pleasanton, and Alameda County do not include specific projections or cumulative impacts analysis for fisheries. As noted in **Section 3.6, Fisheries**, the stream channels within the project area are limited in habitat quality for this species, and serve primarily as potential migratory routes in the event that future restoration activities within the watershed are successful. Development under the General Plans would continue to exert pressure on these migratory corridors due to encroachment on riparian areas, increased flow generation, non-point source pollution, and potential channelization of natural waterways.

Other Regional Flood Management Programs

Other regional hydrologic or biological resources management programs identified in Section 5.2.3 are located downstream of the SMMP project area, with the exception of Del Valle Reservoir flood control operations. The consistent objective of these programs is to manage flood flows and to improve biological resource habitat within the Alameda Creek Watershed, primarily for steelhead. In general, these projects and programs emphasize removal of barriers to steelhead migration within the Alameda Creek Watershed and would have a beneficial impact to fisheries.

SMMP Contribution

Implementation of the SMMP would include the removal or redesign of 10 existing fish migration barriers within the SMMP project area. The removal of these barriers would provide improved access to migrating steelhead adults to the upper Alameda Creek Watershed. As noted in **Section 3.6, Fisheries**, habitat quality within the SMMP project area is limited, with rearing habitat limited to areas on Arroyo Mocho north of Mines Road. The remainder of the SMMP project area constitutes primarily migratory habitat for these species. Implementation of one-time

sediment removal projects under the SMMP would affect potential future migratory habitat for central coast steelhead. Implementation of phasing measures would minimize potential migration effects to the degree feasible. Diversion of flows into the Chain of Lakes could affect out-migration of juveniles; however, weir design and diversion frequency are anticipated to minimize this potential effect. Improved sediment management practices, establishment of low-flow channels, fish-passable grade control, and the use of biotechnical bank stabilization are anticipated to result in long-term benefits to habitat conditions within the SMMP project area. When combined with the removal of migratory barriers, the SMMP would likely provide an overall benefit to steelhead restoration within the watershed, particularly when compared to existing conditions. Therefore, the SMMP's impact to fisheries would be cumulatively considerable and beneficial.

Mitigation Measures

Measure 5.5: Implement Mitigation Measures contained in **Section 3.6, Fisheries.**

Impact Significance after Mitigation: Beneficial at the MEIR Level.

Impact 5.6: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term geologic impacts. Less than Significant with Mitigation.

General Plan and Municipal CIP Effects

General Plan development and implementation of municipal CIPs would contribute to impacts to geology and soils. Projected cumulative impact discussion in the Dublin General Plan EIR (1984) indicated that while specific sites in Dublin designated for general plan implementation may be unsuitable for development, the geologic impacts would not be significant. Further the Safety Element in the general plan would ensure minimal impacts (City of Dublin, 1984).

New development in Pleasanton would expose additional structures to damage and additional people to injury resulting from fault rupture, ground shaking, slope failure, and expansive soils. With implementation of public safety programs, impacts related to fault rupture, slope failure, and expansive soils would be reduced to less-than-significant levels; however impacts from ground shaking would not be mitigable (City of Pleasanton, 1996b).

Because geologic conditions are highly localized, Livermore general plan implementation would not result in cumulative geologic impacts. Conformance with the Uniform Building Code and other measures that would preserve integrity during seismic event would reduce the cumulative impact to less-than-significant (City of Livermore, 2003).

Cumulative geologic impacts in Alameda County would be predominantly associated with development and the resulting increased risk of exposure of people and structures to geologic

hazards. Although the impacts could be significant the general plan policies and programs would minimize the significance in Alameda County (Alameda County, 1993).

Other Regional Flood Management Programs

Other regional hydrologic or biological resources management programs identified in Section 5.2.3 are located downstream of the SMMP project area, with the exception of Del Valle Reservoir flood control operations. The consistent objective of these programs is to manage flood flows and to improve biological resource habitat within the Alameda Creek Watershed, primarily for steelhead. However, implementation of these projects would have the potential to affect geology and soils, particularly those projects related to dam repair or removal. These projects would be required through both CEQA and permitting processes to include measures to minimize, avoid, or mitigate for these impacts, to the degree feasible.

SMMP Contribution

The proposed construction projects within the SMMP would comply with requirements of the most recent California Building Code (Title 24), as appropriate. Conformance with these codes and implementation of **Mitigation Measure 3.3.2a** would reduce the risks of injury and structural damage from ground shaking, liquefaction, and earthquake-induced settlement. (See **Section 3.3, Geology** for details). Due to the lack of habitable structures proposed under the SMMP, the SMMP's contribution to geologic hazards would not be cumulatively considerable.

Mitigation Measures

Measure 5.6: Implement Mitigation Measures established in **Section 3.3, Geology and Soils**.

Impact Significance after Mitigation: Less than Significant.

Impact 5.7: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to land use. Less than Significant with Mitigation.

General Plan and Municipal CIP Effects

General Plan development and implementation of municipal CIPs would contribute to impacts to land use. Projected cumulative impact discussion in the Dublin General Plan EIR (1984) described impacts resulting from the build out of the general plan. The 1984 Dublin General Plan would result in significant effects on agricultural open space in the extended planning area. No mitigation is available for loss of agricultural open spaces. The general plan policies would require denial or mitigation of urban development proposals that would have significant adverse effects on adjoining lands remaining under the Williamson contract (City of Dublin, 1984).

The potential impacts on land use that would result from permitted development in Pleasanton would be mitigated by the policies and programs included in the general plan Update. The general plan policies and programs would promote compatibility of new development with existing neighborhood character and would minimize land use conflicts between adjacent uses. However, one impact expected to be significant despite mitigation is the conversion of prime agricultural land to urban development. This impact is also identified to be cumulatively considerable in combination with conversion of other agricultural lands in Alameda County (City of Pleasanton, 1996b).

According to the Livermore General Plan EIR (2003), cumulative projects in combination with general plan implementation are expected to result in extensive land use changes on the regional level. Urban growth in Livermore would be confined by the Urban Growth Boundary¹. The land use impacts resulting from general plan implementation would be reduced to less-than-significant through use of mitigation measures. Because the general plan would increase the density of Livermore within the Urban Growth Boundary and would result in the development of transit-oriented development, the cumulative impacts would be less-than-significant (City of Livermore, 2003).

Cumulative land use impacts in Alameda County include general intensification of land uses in the region and a transition of an agricultural landscape to an increasingly urban setting. Implementation of the general plan would cause significant land use impacts resulting in conversion and encroachment of agricultural land. However, the general plan policies and programs would mitigate the impacts to less-than-significant (Alameda County, 1993).

Other Regional Flood Management Programs

Other regional hydrologic or biological resources management programs identified in Section 5.2.3 are located downstream of the SMMP project area, with the exception of Del Valle Reservoir flood control operations. The consistent objective of these programs is to manage flood flows and to improve biological resource habitat within the Alameda Creek Watershed, primarily for steelhead. Due to their geographic location relative to other land uses, these projects are not anticipated to affect land use within the region.

SMMP Contribution

The proposed project is not a development project resulting in any long term change in land uses, other than the dedication of approximately 146 acres to floodplain management and 22 acres to habitat. Implementation of the SMMP would not result in loss of agricultural lands, and therefore would not contribute to the cumulative impact identified in the General Plans noted above. Impacts on land use would be short term and temporary associated with construction, such as short term noise, construction dust, and detours. **Section 3.4, Land Use**, discusses potential impacts on existing land use for each reach and identifies impacts to be less-than-significant with mitigation depending upon the land use for each reach. Therefore, the SMMP's contribution to long-term alterations in land use would not be cumulatively considerable.

¹ Urban Growth Boundary surrounds the city of Livermore and generally coincides with the city limits.

Mitigation Measures

Measure 5.7. Implement Mitigation Measures in **Section 3.4, Land Use.**

Impact Significance after Mitigation: Less than Significant.

Impact 5.8: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to cultural resources. Less than Significant with Mitigation.

General Plan and Municipal CIP Effects

The Dublin General Plan EIR (1984) includes no discussion of cultural resource impacts.

Similar to the cultural resources discussion in **Section 3.12** of this EIR, the Pleasanton General Plan EIR (1996) stated that the potential impact of development under the general plan on historic resources can be determined only after site specific details are defined. Implementation of programs to preserve cultural resources under the general plan would reduce the potential impacts to less-than-significant level (City of Pleasanton, 1996b).

In Livermore, construction activities associated with the projected development and cumulative projects could result in significant impacts to identified and unidentified historical, archaeological, and paleontological resources, and unique geologic features. However, the developments discussed in the general plan would be subject to extensive mitigation measures designed to protect cultural resources. Such mitigation would include monitoring of construction areas around known archaeological sites, reporting the recovery of any unidentified human remains to the appropriate authorities, and preservation of protected cultural resources. The cumulative impacts therefore are described as less than significant (City of Livermore, 2003).

Most of the East County planning area is located within moderate, high, or extreme archaeologically sensitive areas. Construction of buildings or infrastructure associated with development as well as intensive agricultural uses allowed in the plan could disturb known or undiscovered archaeological or historic sites. However impacts on such cultural resources would be minimized by adopting the general plan policies and programs as mitigation on a project level (Alameda County, 1993).

Other Regional Flood Management Programs

Other regional hydrologic or biological resources management programs identified in Section 5.2.3 are located downstream of the SMMP project area, with the exception of Del Valle Reservoir flood control operations. The consistent objective of these programs is to manage flood flows and to improve biological resource habitat within the Alameda Creek Watershed, primarily for steelhead. These projects would have the potential to affect known or unknown cultural resources during their implementation. Use of standard BMPs, including cultural resources

analysis, field survey, construction monitoring, and data collection would be anticipated to reduce these impacts to a less-than-significant level on a project-by-project basis. These projects have completed or would be required to complete the appropriate level of CEQA compliance and permitting, including the establishment of mitigation measures to avoid or minimize disturbance of cultural resources.

SMMP Contribution

Implementation of the SMMP would have the potential to affect known or unknown cultural resources during their implementation. Potential impacts to unknown cultural resources that may occur within construction footprints would be reduced to the degree feasible by implementation of measures established in **Section 3.12, Cultural Resources**, which include cultural resources analysis, field survey, construction monitoring, and data collection and would be anticipated to reduce these impacts to a less-than-significant level on a project-by-project basis. However, because of the sensitivity of the Livermore Valley, the previous location of substantial resources along stream channels within the Livermore Valley, and the area disturbed over the course of the program, cumulative contribution of the SMMP to impacts to cultural resources could be cumulatively considerable.

Mitigation Measures

Measure 5.8: Implement Mitigation Measures contained in **Section 3.12, Cultural Resources**.

Impact Significance after Mitigation: Significant and Unavoidable at the MEIR Level – Potentially Mitigable at the Project Level.

Impact 5.9: Concurrent construction of SMMP projects with General Plan development and municipal projects within the Livermore Valley and regional hydrology and biological resource management projects within the Alameda Creek Watershed could result in cumulative long-term impacts to visual resources. Less than Significant with Mitigation.

General Plan and Municipal CIP Effects

Projected cumulative impact discussion in the Dublin General Plan EIR (1984) described impacts resulting from the build out of the general plan. Visual impacts resulting from residential development in the east and west hills of the Dublin extended planning area would vary with specific sites. The visual impacts would be significant particularly on exposed slopes. However policies under the general plan would regulate the location of development to lessen visual impacts (City of Dublin, 1984).

According to the Pleasanton general plan, new development may occupy the foreground area of views of Mt. Diablo, Pleasanton Ridge, and other distant hill formations. Obstruction to significant views is a potentially significant impact. However, implementation of programs in the

General Plan would reduce the potential impacts to less-than-significant (City of Pleasanton, 1996b).

The Livermore General Plan EIR (2003) describes a substantial change to the visual character of the Tri-Valley area from the development associated with the Livermore General Plan and cumulative projects implementation. The projects would transform several thousand acres of undeveloped land into suburban uses. However general plan policies would ensure the preservation of viewsheds, hillsides, and other land marks and protection of the visual character of Livermore. The cumulative impacts to the regional visual quality therefore would be less-than-significant (City of Livermore, 2003).

The Alameda County General Plan discusses accommodation of growth in the county for considering cumulative impacts. General plan implementation in the county would require significant and unavoidable changes to the visual character of the region (Alameda County, 1993).

Other Regional Flood Management Programs

Other regional hydrologic or biological resources management programs identified in Section 5.2.3 are located downstream of the SMMP project area, with the exception of Del Valle Reservoir flood control operations. The consistent objective of these programs is to manage flood flows and to improve biological resource habitat within the Alameda Creek Watershed, primarily for steelhead. Due to their geographic isolation, these projects are not anticipated to affect visual resources within the SMMP project area.

SMMP Contribution

The SMMP would consist of excavated trenches, temporary stockpiled soils, and other materials at the construction sites on the reaches, which would constitute negative aesthetic elements in the visual landscape. However, as noted in **Section 3.13, Visual Resources**, these effects would be temporary during project construction, and would not be considered significant on a program level. On a long-term basis, facilities would be limited to stream channels or areas immediately adjacent to stream channels. Although the existing visual conditions would be altered at individual project locations, visual conditions would be consistent with visual surroundings, and long-range view or vistas would not be substantially altered. Therefore, the SMMP's contribution to impacts to visual resources would be less than cumulatively considerable.

Mitigation Measures

No mitigation measures required.

References – Cumulative Impacts

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CHAPTER 6

Alternatives

6.1 Introduction

6.1.1 CEQA Requirements for Alternatives Analysis

The California Environmental Quality Act (CEQA) Guidelines require EIRs to describe and evaluate a reasonable range of alternatives to a project, or to the location of a project, that would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. The Guidelines set forth the following criteria for alternatives:¹

- Identifying Alternatives. The range of alternatives is limited to those that would avoid or substantially lessen any of the significant effects of the project, are feasible, and would attain most of the basic objectives of the project. Factors that may be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site. An EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. The specific alternative of ‘no project’ shall also be evaluated along with its impact.
- Range of Alternatives. An EIR need not consider every conceivable alternative, but must consider a reasonable range of alternatives that will foster informed decision-making and public participation. The “rule of reason” governs the selection and consideration of EIR alternatives, requiring that an EIR set forth only those alternatives necessary to permit a reasoned choice. The lead agency, Zone 7 Water Agency, is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives.
- Evaluation of Alternatives. EIRs are required to include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the project. Matrices may be used to display the major characteristics of each alternative and significant environmental effects of each alternative to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative must be discussed but in less detail than the significant effects of the project.

¹ CEQA Guidelines Section 15126.6.

In general, there are two types of alternatives that may be reviewed in an EIR: (1) alternatives *to* the project that are other projects entirely, or other approaches to achieving the project objectives rather than the project or modified project; and (2) alternatives *of* the project that include modified project components, such as alternative project sites or processes and/or modified facilities, layout, size, and scale.

In accordance with the CEQA Guidelines, the alternatives considered in this EIR include those that 1) could accomplish most of the basic objectives of the project, and 2) could avoid or substantially lessen one or more of the significant effects of the project. To provide the appropriate context for this alternatives analysis, the project objectives and key significant effects are summarized below.

6.1.2 Project Objectives

The SMMP has been developed to address this potentially damaging flooding issue, while also considering other resource areas affected by management of flood channels and arroyos. Specific SMMP goals for each resource area are presented in **Table 6-1**. **Table 6-2** develops specific objectives for each of the goals. These goals and objectives were used to guide the development of individual projects identified under the SMMP.

TABLE 6-1
SMMP RESOURCE GOALS

Resource Area	SMMP Goal
Flood Protection and Drainage	Protect people, property and stream corridors from damaging drainage and floods
Erosion and Sedimentation	Reduce or manage erosion and sedimentation in a manner that is compatible with other stream resources
Water Supply	Provide adequate conveyance of water for recharge and storage needs
Water Quality	Protect and enhance water quality of streams and groundwater
Habitat and Environment	Protect and enhance aquatic and riparian habitat associated with streams and wetlands
Trails, Recreation, and Public Education	Promote recreational, alternative transportation, and public education opportunities along streams and the Chain of Lakes

TABLE 6-2
SMMP RESOURCE GOALS AND OBJECTIVES

Resource Area	Goal	Objectives
Flood Protection and Drainage	Protect people, property and stream corridors from damaging drainage and floods	A. Design and maintain streams and flood protection facilities to convey design flows while supporting natural ecosystem functions to the greatest extent possible. B. Implement improvements to flood protection system necessary to manage 100-year storm event at General Plan land use conditions. C. Modify FEMA 100-year flood zone as necessary to protect people and property. D. Promote multi-use concept for flood protection facilities. E. Promote coordination of flood protection and drainage projects between agencies.
Erosion and Sedimentation	Reduce or manage erosion and sedimentation in a manner that is compatible with other stream resources	A. Implement improvements necessary to eliminate or mitigate the effects of erosion and sedimentation on flooding, water quality, and native habitats. B. Develop long-term strategies as needed to streamline the permitting of sediment removal required to meet the flood protection and sediment objectives. C. Conduct sediment management and maintenance activities on flood protection facilities in a manner that allows conveyance of design flows while supporting natural ecosystem functions to the greatest extent possible.
Water Supply	Provide adequate conveyance of water for recharge and storage needs	A. Maintain adequate recharge capacity in average and drought years in Arroyo del Valle, Arroyo Mocho and Chain of Lakes to comply with Zone 7 groundwater management strategies. B. Maximize potable source water storage and recharge potential in Chain of Lakes. C. Maximize storage of non-potable supplies in Chain of Lakes, as appropriate. D. Coordinate storage and recharge strategies with plans for delivery of potable and non-potable water. E. Maintain streams and Chain of Lakes to accomplish storage and recharge objectives. F. Provide adequate water quantity to sustain native fisheries and other aquatic life.
Water Quality	Protect and enhance water quality of streams and groundwater	A. Protect surface and groundwater supplies. B. Coordinate with local and regional agencies to facilitate compliance with state and federal non-point source NPDES requirements. C. Minimize erosion and sediment accumulation in streams. D. Coordinate with local and regional agencies to eliminate impaired water body designations. E. Provide adequate water quality to sustain native fisheries and other aquatic life. F. Maintain streams and Chain of Lakes to meet above requirements.

TABLE 2-2 (continued)
SMMP RESOURCE GOALS AND OBJECTIVES

Resource Area	Goal	Objectives
Habitat and Environment	Protect and enhance aquatic and riparian habitat associated with streams and wetlands	A. Integrate environmental and habitat requirements into projected water management practices. B. Promote sustainable, native habitats wherever possible. C. Preserve and enhance stream buffers and riparian areas. D. Protect existing and create new wetlands with multiple use. E. Promote environmentally sensitive sediment removal practices. F. Maintain streams and Chain of Lakes to meet above objectives.
Trails, Recreation, and Public Education	Promote recreational, alternative transportation, and public education opportunities along streams and the Chain of Lakes	A. Promote community involvement in stream stewardship. B. Provide educational opportunities for students and the general public. C. Cooperate with local and regional agencies to implement appropriate recreational features along streams and the Chain of Lakes. D. Promote trails and recreation features that provide connectivity to existing or future planned trails, and recreational areas or facilities. E. Protect or enhance visual resources along streams. F. Incorporate public safety measures into recreational features along streams and Chain of Lakes. G. Promote the expansion of trails to develop alternative, non-motorized transportation corridors along the streams and arroyos.

6.2 Alternatives to the Project

6.2.1 No Project Alternative

Discussion of the No-Project Alternative must examine the existing conditions and reasonably foreseeable future conditions that would exist if the project were not approved (CEQA §15126.6(e)). Under the No Project Alternative, Zone 7 would not implement construction of facilities identified under the SMMP. When considered in the context of existing conditions, this would avoid the construction of the 45 projects identified under the SMMP. As such, impacts identified in **Chapter 3**, and summarized above in **Section 6.1.2**, would be avoided.

Implementation of the No Project Alternative would not meet any of the stated SMMP objectives, and would not address regional flood control conveyance issues, including areas that are currently mapped in the FEMA 100-year floodplain. As shown in **Figure 2-4, Chapter 2, Project Description**, the existing 100-year floodplain is not contained within the existing channels at several locations within the Valley. This existing condition would remain unchanged. This alternative is not considered superior to the SMMP, because it would not meet the most basic project objectives, which include provision of flood protection for a 100-year flood event.

Under the No Project Scenario, reasonably foreseeable future condition, the existing 100-year floodplain condition within the SMMP project area would be exacerbated as flow volumes increase over time due to increased development within the SMMP project area. Zone 7 would continue to perform a minimal amount of annual maintenance on its existing facilities, but would not be able to make improvements to its existing system given current regulatory and funding constraints. At buildout, it is anticipated that the 100-year floodplain will expand due to the increase in stormwater flows. Therefore, the No Project Alternative is not considered superior to the SMMP, whether considered under existing or reasonably foreseeable future conditions, because it would not meet the most basic project objectives, which include provision of flood protection for a 100-year flood event.

6.2.2 Buildout of 1966 Master Plan via Special Drainage Area 7-1 Program Funding

Under this alternative, Zone 7 would implement improvements as defined in the 1966 Master Plan, which identifies channelization and improvements to approximately 100 miles of stream channel to provide flood protection. Buildout of the 1966 Master Plan would be implemented using the Special Drainage Area (SDA 7-1) Program, which is currently Zone 7's only source of revenue for new improvements to the existing flood control system. Ordinance 53 was established to collect drainage fees from new developments to help fund improvements of the SDA 7-1 Program. Under this program, Zone 7 enters into agreements with developers to take ownership, and thus maintenance responsibility, of the facilities that are constructed to Zone 7 standards. A predetermined amount is reimbursed to the developers for the channel improvements and right-of-way.

Implementation of the 1966 Master Plan using the SDA program criteria would result in improvements to existing channels throughout the Zone 7 service area to accommodate 100-year flows at buildout. This would include application of design criteria contained within the Green Book HGL. The design criteria, put forth by the U.S. Army Corps of Engineers, provide for gravity flow using a trapezoidal channel design.

To provide for adequate gravity flow to meet existing and future 100-year flows, a series of improvements within the Chain of Lakes area would be required to provide adequate channel capacity to contain and convey 100-year flows through the Chain of Lakes area to Arroyo Mocho. Arroyo Las Positas through the Las Positas Golf Course would have to be enlarged to contain and convey 100-year flows. Arroyo Mocho would require sediment removal and channel enlargement to restore its design capacity to convey 100-year event flow to Arroyo de la Laguna (ADLL). Finally, channelization of ADLL would be necessary to increase its current capacity of 18,700 cfs to accommodate the projected 100-year flow of 25,500 cfs at buildout.

Environmental Impacts

Implementation of the 1966 Master Plan would have substantial environmental impacts. Several conceptual alternatives for an ADLL Flood Control Project have been previously developed to evaluate solutions to the flooding problems along the Arroyo, including MacKay and Soms, September 10, 1998. The report evaluated four Improvement Alternatives to ADLL, including the following:

- Alternative 1: Stabilize Existing Channel
- Alternative 2A: Stabilize Banks with Open Channel Bypass
- Alternative 2B: Stabilize Banks with Underground Conduit Bypass
- Alternative 3A: Existing Banks with Open Channel Bypass
- Alternative 3B: Existing Banks with Underground Conduit Bypass
- Alternative 4A: Low Flow Channel with Open Channel Bypass
- Alternative 4B: Low Flow Channel with Underground Conduit Bypass

In addition to the Improvement Alternatives in the McKay and Soms report, widening of ADLL on the east side only was an alternative. The proposed widening would extend from Bernal Avenue to the Castlewood Drive Bridge representing approximately 8,200 linear feet (1.6 miles) of the channel. The proposed channel bottom width would be approximately 50 feet and the eastern bank would be sloped to a ratio of 3:1 (H:V).

Constraints associated with the widening of the ADLL are described below:

- Existing Roadway Bridges: Major obstacles to this approach include the Bernal and Castlewood bridges. Engineering solutions to integrate proposed channel width and depth with either current or proposed bridges would be necessary, including potential retrofit of footings to withstand increased flow volumes and velocities.
- Riparian/Oak Woodland Losses: Based upon an estimated channel length of 8,200 linear feet and a riparian/oak woodland corridor of 50 feet on one side, the estimated riparian/oak woodland corridor losses would be in the order of 10 acres. This stretch of ADLL

represents one of the last reaches of mature riparian/oak woodland forest within the Livermore Valley. Based upon a generic tree density of 50 trees per acre, this would result in an estimated loss of over 500 trees. Assuming a minimum 3:1 mitigation ratio (for oak woodland, a 10:1 mitigation ratio has been imposed on projects), this would result in a mitigation requirement of over 1,500 trees. Replanting, irrigation, and maintenance for a minimum of 3 to 5 years at an equivalent riparian location do not appear feasible within Zone 7's service area. Even with planting the side slopes and top-of-bank areas, the temporal losses, resulting in habitat fragmentation, would occur over a period of several years, possibly decades.

- *Wetland Losses:* Assuming an existing channel width of 50 feet, estimated maximum wetland loss would be on the order of 10 acres. At a minimum 3:1 mitigation ratio for the temporary loss of wetlands, this would result in a mitigation requirement of 30 acres of wetland. A portion of this wetland loss could be mitigated or offset within the newly created channel width.
- *Wildlife Losses/Displacement:* Construction of a widened ADLL would result in the direct loss of common wildlife species associated with a riparian/oak woodland community. However, the displacement of wildlife would be a greater impact. Examination of aerial photographs of the ADLL area show that except for the narrow riparian corridor, suburban land uses dominate; therefore, there are no adjoining areas to which wildlife can move into and occupy. An indirect loss of wildlife species would occur during and after construction. In addition, riparian habitats are utilized by migratory birds.
- *Sensitive Species Habitat Losses:* Alameda Creek is within the Critical Habitat Designation for coastal steelhead. The Alameda County Water District (ACWD), Bay Area Rapid Transit District (BART), and National Oceanic Atmospheric Administration (NOAA) Fisheries Service are currently in negotiations for installation of fish passages to restore migratory access to Alameda Creek. Shaded riparian area is a key element of steelhead habitat. Removal of one of the last remaining mature riparian/oak woodland canopies within the Livermore Valley would not be considered acceptable to the NOAA Fisheries or the California Department of Fish and Game (CDFG). Although not a key California red-legged frog reach, western pond turtle (a species of concern) have been observed within this reach.
- *Private Property Acquisition:* Assuming that only the east side of the arroyo is widened and therefore would be owned by Zone 7, the property acquisition for this reach would be similar to the 275-foot wide strip of property set aside by the Bernal Property. It is assumed that for the reach in the Castlewood Country Club to the Castlewood Drive Bridge, a 275-foot wide strip of land will be required. The golf course would need to be modified to accommodate the channel widening. Several fairways in the Valley Course would be impacted by the channel widening. The fairways would need to be narrowed or lowered to provide the flow way needed for the additional conveyance capacity. As reported in the MacKay and Somps report, the modification to the golf course would be met with opposition from the course owners and members.

Comparison of Hydraulic Grade Line

Figure 6-1 presents a comparison of predicted water surface elevations (WSEs) along ADLL for both the Green Book and the HEC-RAS model used to review proposed SMMP facilities. As

shown in this graphic, the two models have a strong correlation. Differences between the HEC-RAS and Green Book WSEs varied from -2 to +10 feet (RMC, 2004). The area of highest differential occurs just downstream of the Pleasanton Canal confluence with ADLL. The increase in WSE has been addressed in Project R.8-4 by installation of a 4-foot high flood wall and pump stations to maintain adequate freeboard within the Del Prado neighborhood. Based on this analysis, the SMMP would provide an equivalent level of flood protection within the Livermore Valley when compared to implementation of the Green Book criteria.

Relationship to Project Objectives

As noted in Section 6.1.2 above, the SMMP has been developed to address this potentially damaging flooding issue, while also considering other resource areas affected by management of flood channels and arroyos. Implementation of the 1966 Master Plan Alternative would directly conflict with the following project objectives.

Flood Protection and Drainage

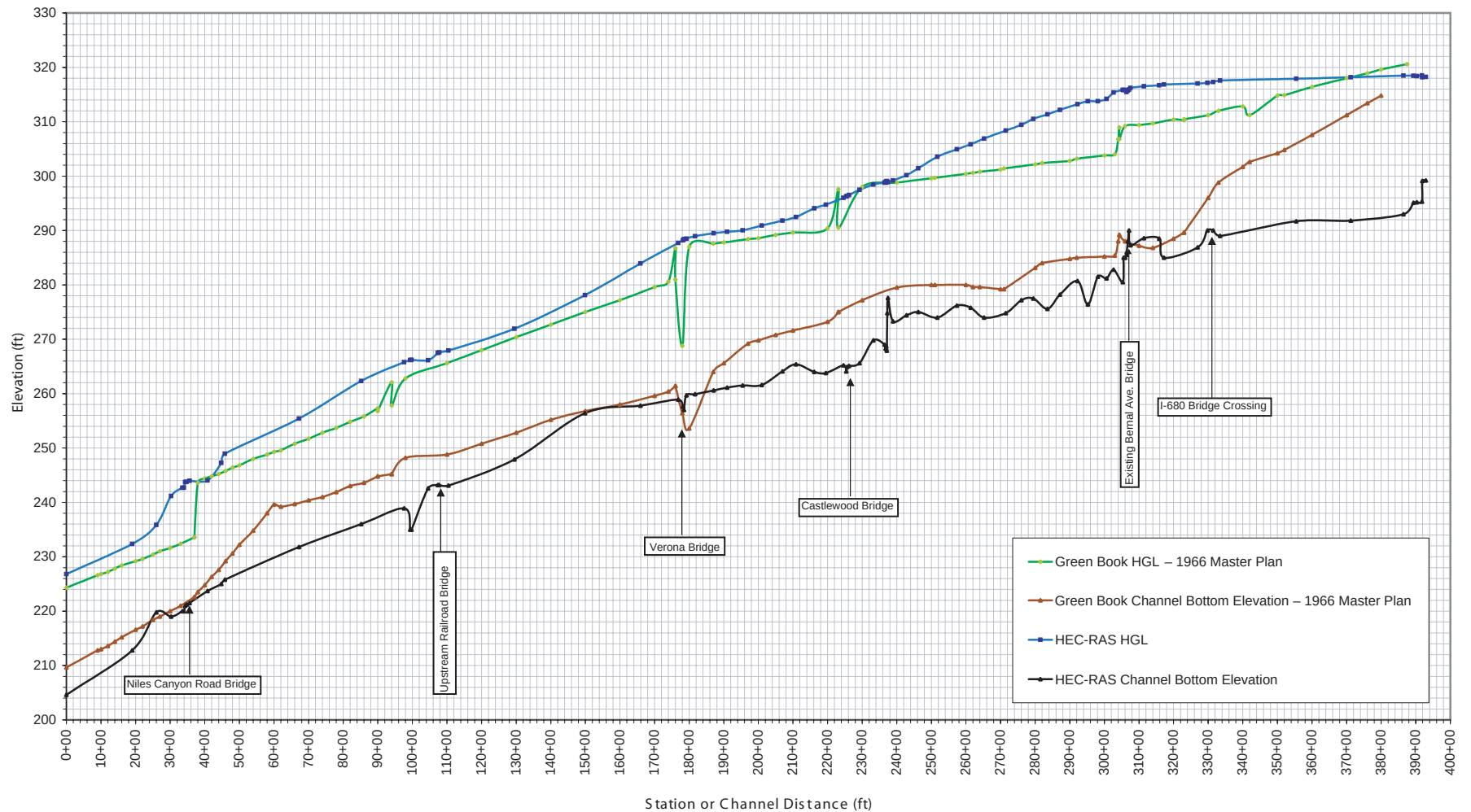
Implementation of the 1966 Master Plan would meet the Flood Protection and Drainage resource area overall goal of protecting people, property, and stream corridors from damaging drainage and floods. It would also meet Objectives B and C, which address the provision of adequate 100-year flood protection. However, it would not meet Objectives A and D, which relate to supporting natural ecosystems functions to the greatest extent feasible, and promoting multi-use concepts of flood protection. Implementation of this alternative would result in significant and unavoidable loss of riparian corridor along ADLL, and would not support or maintain this resource to the maximum extent available. Similarly, this planning approach is focused on provision of flood control only, and does not serve multiple uses, such as habitat enhancement or recreational benefit.

Erosion and Sedimentation

Implementation of flood conveyance channels under the criteria provided for in the 1966 Master Plan would not meet the majority of the objectives established for Erosion and Sedimentation. No provisions for erosion and sediment management is provided for under this alternative, which would rely on gravity flow for conveyance of flows, and corresponding sediment loads, out of the SMMP project area. Use of these criteria within the SMMP project area has resulted in sediment deposition at several locations within the project area, due to grade transition areas between channel designs. Its implementation would continue to exacerbate this condition, and would not provide for management of erosion in a manner that is compatible with other stream resources, such as habitat and environment. This alternative does not provide regional management to sedimentation that would satisfy regulatory requirements or streamline the permitting process for sediment removal projects. Therefore, this alternative would not meet the stated objectives for Erosion and Sedimentation.

DOWNSTREAM
(CONFLUENCE W/ ALAMEDA CREEK)

UPSTREAM
(CONFLUENCE W/ ARROYO MOCHO)



SOURCE: RMC, 2004

Zone 7 SMMP . 203485

Figure 6-1
Water Surface Elevations –
1966 Master Plan vs. SMMP

Water Supply

Implementation of flood conveyance channels under the criteria provided for in the 1966 Master Plan would not meet the majority of the objectives established for Water Supply. Although this alternative would provide adequate recharge capacity in Arroyo del Valle and Arroyo Mocho, similar to existing conditions (Objective A), it would not maximize potable and non-potable source water storage and recharge potential in the Chain of Lakes, or provide for coordination of storage and recharge strategies, or maintain streams and the Chain of Lakes for storage and recharge objectives (Objectives B through E), as no improvements to the Chain of Lakes would occur. Therefore, this alternative would not meet the stated objectives for Water Supply.

Water Quality

Implementation of flood conveyance channels under the criteria provided for in the 1966 Master Plan would not meet the majority of the Objectives established for Water Quality. No provisions for erosion and sediment management is provided for under this alternative, which would rely on gravity flow for conveyance of flows, and corresponding sediment loads, out of the SMMP project area. Use of these criteria within the SMMP project area has resulted in sediment deposition at several locations within the project area, due to grade transition areas between channel designs. Its implementation would continue to exacerbate this condition, increasing maintenance requirements when compared to the proposed SMMP. Therefore, this alternative would not meet the stated objectives for Water Quality.

Habitat and Environment

As noted in the discussion of environmental impacts above, implementation of flood conveyance channels under the criteria provided for in the 1966 Master Plan would result in substantial impact and loss of the ADLL riparian corridor, as well as substantial losses along any other stream channels proposed for using this design. As such, it would directly conflict with both the overall Goal and the Objectives A through F for the Habitat and Environment resource area.

Trails, Recreation, and Public Education

Implementation of flood conveyance channels under the criteria provided for in the 1966 Master Plan would not directly conflict with the goals and objectives established for recreational, trails and public education. However, facilities implemented by Zone 7 historically under this program have not consistently included these types of recreational amenities, and their funding has not been specifically identified as an objective of the overall program. Implementation of this alternative would not result in the promotion and level of benefit for recreation envisioned under the SMMP.

6.2.3 Flood Detention and Conveyance Alternative

The Flood Detention and Conveyance Alternative would reduce the number of projects implemented under the SMMP by including only the minimum projects necessary to meet the basic project objective for flood protection during a 100-year flood event. Projects that could be included under the Flood Detention and Conveyance Alternative would include channel

conveyance to the Chain of Lakes, detention storage at the Chain of Lakes, and channel improvements downstream. Projects that would be implemented under this alternative include R.6-2, R.8-3, R.8-4, and R.10-1 through R.10-5. Implementation of these projects would substantially alleviate capacity deficiencies and reduce potential flooding effects from 100-year flood events.

Environmental Impacts

This alternative would result in the implementation of a reduced set of SMMP projects, and would represent the minimum set of projects necessary to achieve the regional flood control benefits of the SMMP. As such, the overall construction-related impacts of the SMMP would be reduced under this alternative, as only eight of the SMMP's 45 projects would be implemented. These eight projects would include the improvements to the Arroyo Mocho, Arroyo las Positas, and Chain of Lakes to provide regional detention storage. This alternative would also include the channel stabilization and enhancement components along ADLL to address bank erosion and stability issues.

Environmental impacts associated with this alternative would be similar to those identified for the larger SMMP program on an issue by issue basis. Implementation would include short-term construction related impacts, such as noise, air quality, traffic, and visual resources that would be reduced to a less-than-significant level through the application of mitigation measures established in Chapter 3.0, as well as project specific measures established in subsequent project-specific CEQA analysis. Long-term impacts to biological resources would be specific to the projects implemented under this alternative, and would be reduced when compared to the larger SMMP. Because this alternative includes the use of detention storage via diversion at the Chain of Lakes, fisheries issues related to diversion would be equivalent to the proposed project. This alternative would also include improvements along ADLL that would be expected to benefit anadromous fish passage and improve habitat conditions.

Comparison of Hydraulic Grade Line

Predicted WSEs along ADLL under this alternative would be similar to that shown in Figure 6-1 for the HEC-RAS model used to review the proposed SMMP facilities. This alternative would provide the essential hydraulic components of the SMMP to maintain WSE in ADLL at levels that can be conveyed by existing channel capacities. Therefore, implementation of this alternative would provide an equivalent level of flood protection within the Livermore Valley when compared to implementation of both the SMMP and the Green Book criteria.

Relationship to Project Objectives

As noted in Section 6.1.2 above, the SMMP has been developed to address this potentially damaging flooding issue, while also considering other resource areas affected by management of flood channels and arroyos. Implementation of this alternative would be consistent with the overall program objective. However, because this alternative would include a reduced number of projects, the anticipated benefits realized under the alternative would be reduced when compared

to the SMMP. Discussion of this alternative's ability to meet the stated project objectives is provided below.

Flood Protection and Drainage

Implementation of the Flood Detention and Conveyance Alternative would meet the Flood Protection and Drainage resource area overall goal of protecting people, property, and stream corridors from damaging drainage and floods. It would also meet Objectives B and B, which address the provision of adequate 100-year flood protection. Consistent with Objectives A and D, the Flood Detention and Conveyance Alternative would support natural ecosystems functions, and promote multi-use concepts of flood protection. Therefore, this alternative is considered consistent with the stated Project Objectives.

Erosion and Sedimentation

Implementing the Flood Detention and Conveyance Alternative would meet the majority of the Objectives established for Erosion and Sedimentation. The regional benefits of sediment capture at the Chain of Lakes would occur. However, the Flood Detention and Conveyance Alternative would not provide for sediment basin establishment and bank stabilization projects within the upper portions of the watershed above Chain of Lakes. Therefore, benefits of bank stabilization, and a sediment removal program that is focused on specific locations upstream of the Chain of Lakes, would not be included in this program. Therefore, this alternative may not meet Objective B as it relates to streamlining the permitting process.

Water Supply

Implementation of the Flood Detention and Conveyance Alternative would meet the majority of the objectives established for Water Supply. Consistent with the SMMP, it would provide for recharge capacity in Arroyo Mocho and Arroyo del Valle and would maximize potable and non-potable source water storage through development of the Chain of Lakes. This alternative would not include Project R.4-1, Sycamore Grove Recharge Bypass Project, and would not address recharge options on Arroyo del Valle; however, Zone 7 could continue to meet objectives related to water supply through current operations. As noted in Chapter 3.0, secondary environmental effects to sensitive species habitat may outweigh the benefits of Project R.4-1. Implementation of the Flood Detention and Conveyance Alternative would meet the stated objectives for Water Supply.

Water Quality

Implementation of the Flood Detention and Conveyance Alternative would meet the majority of the objectives established for Water Quality. This alternative would include the regional benefits of sediment capture at the Chain of Lakes. However, the Flood Detention and Conveyance Alternative would not provide for sediment basin establishment and bank stabilization projects within the upper portions of the watershed above Chain of Lakes. Therefore, some of the benefits to water quality associated with erosion control within the upper reaches of the watershed, including reductions in downstream sediment loads and turbidity, would not be included in this program.

Habitat and Environment

Implementation of the Flood Detention and Conveyance Alternative would meet the majority of the objectives established for Habitat and Environment resource area. Implementation of this alternative would provide the benefit of regional retention storage to provide adequate flood control protection and would not require the substantial reconfiguration of ADLL. Therefore, similar to the overall SMMP, impacts associated with the loss of riparian habitat would be avoided. However, when compared to the SMMP, a number of the projects that would directly benefit habitat, particularly within the upper portions of the watershed, would not be implemented. Additionally, three out of nine fish barrier removal projects would not be implemented under this alternative. Therefore, while the Flood Detention and Conveyance Alternative would not specifically conflict with the stated objectives for Habitat and Environment, it would not achieve the level of benefit envisioned under the SMMP.

Trails, Recreation, and Public Education

Implementation of the Flood Detention and Conveyance Alternative would meet the majority of the objectives established for Trails, Recreation, and Public Education. Trail and recreational elements are included within the eight projects proposed under this alternative, including trail components and recreational improvements along Arroyo Mocho and substantial recreational trail features along ADLL. However, when compared to the SMMP, a number of the projects that would directly benefit recreation, trails and public education, particularly within the upper portions of the watershed, would not be implemented. Therefore, while the Flood Detention and Conveyance Alternative would be generally consistent with the goals and objectives for Trails, Recreation, and Public Education, it would not achieve the level of benefit for recreation envisioned under the SMMP.

6.3 Alternatives Conclusions

A comparison of the proposed project (SMMP) and Alternatives with respect to their ability to meet the objectives of the proposed project is provided in **Table 6-3**. Of the alternatives examined, the No Project Alternative, both under existing and reasonably foreseeable future conditions, would not meet the majority of the stated project objectives. The 1966 Master Plan Alternative would meet flood control objectives, but would not meet the other stated project objectives. Implementation of the Flood Detention and Conveyance Alternative would meet the stated objectives, but would not provide the level of benefit envisioned under the full SMMP program.

A comparison of the proposed project (SMMP) and alternatives with respect to their environmental impacts is provided in **Table 6-4**. Of the alternatives examined, the No Project Alternative, both under existing and reasonably foreseeable future conditions, would continue to exacerbate existing flooding conditions within the Livermore Valley. Although construction-related impacts would be avoided, this project would not meet the stated project objectives. The 1966 Master Plan, which would have the greatest level of environmental impact, is not considered feasible within the current regulatory environment, and would not meet the stated project objectives. These alternatives would not reduce or avoid impacts associated with the proposed project, and are not considered

environmentally superior. The Flood Detention and Conveyance Alternative would meet the stated project objectives, and would result in reduced construction-related impacts when compared to the SMMP. However, the facilities that would be implemented under this alternative are the backbone facilities identified under the SMMP, and would include the major sediment removal and channel construction projects that result in the greatest amount of environmental impact within the SMMP. Additionally, although the Flood Detention and Conveyance Alternative represents a feasible alternative to the overall SMMP, and its impacts may be incrementally less due to the reduced number of projects, the substantial environmental benefits envisioned under the SMMP, including wetland creation and riparian enhancements, would not occur under this alternative. Therefore, although construction-related impacts may be reduced, this alternative is not considered environmentally superior to the proposed SMMP.

References – Alternatives

- MacKay & Soms Infrastructure Group, 1998. Conceptual Alternatives Analysis Arroyo de la Laguna Flood Control Project: Prepared for Zone 7 Water Agency. September, 1998.
- RMC, 2004. Draft Technical Memorandum, SMMP Phase 2, Task 1.4: TM No. 4 – Arroyo de la Laguna Hydraulic Grade Line Analysis.

**TABLE 6-3
COMPARISON OF ALTERNATIVES – PROJECT OBJECTIVES**

SMMP Goals	Proposed SMMP	No Project – Existing Condition	No Project – Buildout Conditions	Buildout 1966 Master Plan	Flood Detention and Conveyance Alternative
Flood Protection and Drainage: Protect people, property, and stream corridors from damaging drainage and floods Provides capacity for 100-year flood event at General Plan land use conditions	• Meets capacity • Contains flow through ADLL improvements and chain of lakes (COL) detention resulting in reduced flow through ADLL (18,700 cfs at Bernal Avenue)	• Does not meet capacity • Does not contain flow and does not reduce flow through ADLL (17,000 cfs)	• Does not meet capacity • Does not contain flow and does not reduce flow through ADLL (25,500 cfs)	• Meets capacity • Contains flow through ADLL improvements, does not reduce flow (25,500 cfs)	• Meets capacity • Contains flow; overall flow reduced by COL detention projects; sufficient channel improvements may be implemented to contain resultant flow (~18,700 cfs)
Erosion and Sedimentation: Reduce or manage erosion and sedimentation in a manner that is compatible with other stream resources	• Erosion and sedimentation improvements to reduce erosion, more effectively manage sediment removal, and reduce wetland areas impacted by removal.	• No erosion and sedimentation improvements implemented. Continued sediment deposition and removal required.	• No sediment management improvements. Continued sediment deposition and removal required.	• Erosion and sedimentation managed through conveyance. No additional sediment management.	• Sediment management with subset of 8 SMMP projects, including Cope Lake.
Bedload Yield ^{a,b} (cubic yards/2 year event)	18,000	12,000	18,000	18,000	18,000
Washload Yield ^{a,b} (cubic yards/year)	172,000	184,000	172,000	206,000	172,000
Washload Storage (cubic yards/year)	34,000 (in COL)	35,000 (onto floodplain)	34,000 (onto floodplain)	Not Applicable	34,000 (in COL)
Water Supply: Provide adequate conveyance of water for recharge and storage needs	Water supply conveyance, storage, and recharge improvements would be implemented	No water supply conveyance improvements would be implemented	No water supply conveyance improvements would be implemented	Channel conveyance improvements would not provide additional storage or recharge	Water supply conveyance and recharge improvements through subset of 8 SMMP Projects, including storage at Cope Lake
Water Quality: Protect and enhance water quality of streams and groundwater	Water quality improvements through sediment management and improved recharge	No water quality improvements would be implemented	No water quality improvements would be implemented	No sediment management or recharge elements. Flows conveyed out of valley.	Reduced sediment management and improved recharge through subset of 8 SMMP Projects.

TABLE 6-3 (continued)
COMPARISON OF ALTERNATIVES – PROJECT OBJECTIVES

SMMP Goals	Proposed SMMP	No Project – Existing Condition	No Project – Buildout Conditions	Buildout 1966 Master Plan	Flood Detention and Conveyance Alternative
Habitat and Environment : Protect and enhance aquatic and riparian habitat associated with streams and wetlands	Aquatic and riparian habitat protection and enhancement, including: 76,300 l.f. of riparian planting, 61,500 l.f. of biotechnical bank stabilization, and creation of 28 acres of wetlands	No aquatic and riparian habitat protection and enhancement would be implemented	No aquatic and riparian habitat protection and enhancement would be implemented	Substantial impacts to riparian corridor along ADLL and other channels	Aquatic and riparian habitat enhancement within subset of 8 SMMP projects.
Trails, Recreation, and Public Education Promote recreational, alternative transportation, and public education opportunities along streams and Chains of Lakes	Recreational, alternative transportation, and public education opportunities would be developed, with approximately 36 miles of trail	No recreational, alternative transportation, and public education opportunities would be developed	No recreational, alternative transportation, and public education opportunities would be developed	No recreational, alternative transportation, and public education opportunities would be developed	Some recreational, alternative transportation, and public education opportunities would be developed, with approximately 6 miles of recreational trail

^a The term “Yield” refers to the overall sediment output at the outlet of Arroyo de la Laguna (Yield = Production – Storage, in the case of Washload).

^b The effect of specific SMMP improvements (i.e., bank stabilization and sediment basins) are not accounted for and the bed load transport capacity of the 2-year flow does not change under future build-out conditions with or without the Project.

TABLE 6-4
COMPARISON OF ALTERNATIVES – ENVIRONMENTAL IMPACTS

Resource Goals	Proposed SMMP	No Project – Existing Condition	No Project – Buildout Conditions	Buildout 1966 Master Plan	Flood Detention and Conveyance Alternative
Construction Impacts	Includes 45 in-stream and out of stream construction projects that would result in potential impacts to all resources (i.e., potential sedimentation and erosion, biological and fisheries resources, air quality and noise impacts, hazardous materials concerns, traffic impacts, disturbance of cultural resources)	No construction would be implemented. Therefore, construction impacts would not occur.	Minimal construction associated with long-term maintenance of existing facilities would continue.	- Includes a greater amount of in stream construction than the proposed SMMP; Impacts to ADLL likely significant and unavoidable. - Projects limited to channel improvements; therefore out of stream impacts would be less	Includes 6 in-stream and 2 out of stream construction projects; therefore associated resource impacts would be less than full SMMP.
Operational Impacts					
Maintenance Activities	Maintenance of 45 projects would result in disturbance impacts to biological resources and in-stream wetland areas primarily associated with sediment removal and vegetation maintenance.	No construction would be implemented. Therefore, neither current impacts associated with maintenance of existing facilities, nor impacts for the SMMP, would occur.	Minor disturbance impacts to biological resources and in-stream wetlands associated with current maintenance levels would continue.	Maintenance of new channels and sediment removal requirements increased due to lack of sediment management. Increased disturbance impacts to biological resources and instream wetlands compared to SMMP.	Maintenance of a subset of SMMP Projects; therefore, maintenance requirements would be reduced.
Flooding	Long-term potential flooding hazards would be reduced through regional detention and increased conveyance.	Potential flooding hazards currently exist.	Long-term potential flooding hazards would continue and be increased due to development.	Long-term potential flooding hazards would be reduced through increased conveyance.	Long-term potential flooding hazards would be reduced through regional detention and increased conveyance.
Water Quality	Long-term water quality improvements would be implemented	Water quality is currently affected by erosion and sedimentation.	Long-term water quality impacts from erosion and sedimentation would continue.	Long-term water quality impacts from erosion and sedimentation would continue. No application of sediment management.	Some long-term water quality improvements would be implemented due to subset of SMMP projects

TABLE 6-4 (continued)
COMPARISON OF ALTERNATIVES – ENVIRONMENTAL IMPACTS

Resource Goals	Proposed SMMP	No Project – Existing Condition	No Project – Buildout Conditions	Buildout 1966 Master Plan	Flood Detention and Conveyance Alternative
Biological Resources	Long-term biological and fisheries resources impacts would occur associated with implementation of in-stream projects; however impacts would be reduced by removal of fish barriers and by implementation of habitat enhancement projects	Existing biological and fisheries resources impacts have occurred related to existing fish barriers and deterioration of suitable habitat	Long-term biological and fisheries resources impacts would continue related to existing fish barriers and ongoing deterioration of suitable habitat	Significant habitat removal would be required to implement in stream projects, particularly ADLL. Overall mitigation requirements would be greater than proposed SMMP, likely Significant. Unavoidable.	Long-term biological and fisheries resources impacts would occur; however impacts would be reduced by removal of fish barriers and by implementation of habitat enhancement within subset of 8 SMMP Projects.
Visual Resources	- Long-term visual resources impacts could occur due to sediment removal and increase in man-made structures; however, structures are predominately low-grade and unobtrusive - Vegetative cover would increase as habitat improvements are implemented, resulting in improved visual resources	Some visual resources impacts have occurred due to disturbance following flood events and ongoing erosion	Long-term visual resources impacts could occur due to disturbance following flood events and due to ongoing erosion; however, no new structures would be introduced into the landscape	Long-term visual resources impacts would occur due to riparian habitat removal and establishment of trapezoidal channels.	Long-term visual resources impacts could occur due to sediment removal and increase in man-made structures associated with subset of 8 SMMP projects.
Regulatory Requirements	SMMP includes mitigation program for self mitigation. Linkage of specific projects with mitigation offset would assist regulatory permitting.	Maintenance of existing facilities currently not implemented on regular basis due to regulatory requirements.	Maintenance of existing facilities currently not implemented on regular basis due to regulatory requirements. Low potential for effective regulatory permitting	- Includes significant amounts of hardscape channelization which is not preferred by regulatory agencies - Channelized improvements to ADLL do not appear feasible in today's regulatory environment.	Does not include mitigation program for self mitigation. Linkage of specific projects with mitigation offset would assist regulatory permitting.

CHAPTER 7

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CHAPTER 8

Abbreviations and Acronyms

ABAG	Association of Bay Area Governments
ACFCWCD	Alameda County Flood Control and Water Conservation District
ACWD	Alameda County Water District
AD	(A.D.)
ADLL	Arroyo de la Laguna
ADT	Average Daily Trips
af	Acre-feet
afa	Acre-feet per annum
AT&T	American Telephone and Telegraph
BAAQMD	Bay Area Air Quality Management District
Basin Plan	San Francisco Bay Basin Water Quality Control Plan
BART	Bay Area Rapid Transit
BC	(B.C.)
BDPL	Bay Division Pipeline
BMP	Best Management Practice
Cal-OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBSC	California Building Standard Commission
CCC or ccc	Central California Coast
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDMG	California Department of Mines and Geology
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey (previously the California Department of Mines and Geology)

CIP	Capital Improvement Program
CNDDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CRHR	California Registry of Historic Resources
CWA	Clean Water Act
CWS	California Water Services Company
dB	decibel
dBA	A-weighted decibel
DNL	daytime noise level
DPR	Department of Parks and Recreation
DSRSD	Dublin San Ramon Services District
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EBRPD	East Bay Regional Park District
ECAP	East County Area Plan
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESA	Environmental Science Associates
ESU	Evolutionary Significant Unit
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FIRM	Flood Insurance Rate Map
FY	Fiscal Year
GIS	Geographic Information System
HABS/HAER	Historic American Building Survey/Historic American Engineering Record
HAER	Historic American Engineering Record
HCP	Habitat Conservation Plan
HEC-RAS	Hydraulic Engineering Center's River Analysis System
IS/MND	Initial Study/Mitigated Negative Declaration
LARPD	Livermore Area Recreation and Park District
LF	linear feet

LLNL	Lawrence Livermore National Laboratories
LOMA	Letter of Map Amendment
LOMR	Letter of Map Revision
LOS	Level of Service
LUST	Leaking Underground Storage Tanks
MEIR	Master Environmental Impact Report
mgd	million gallons per day
MMI	Modified Mealli Scale
mph	Miles per Hour
msl	mean sea level
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
PCB	polychlorinated biphenyls
PCE	primary constituent elements
PG&E	Pacific Gas and Electric
PM	particulate matter
PSIAC	Pacific Southwest Inter-Agency Committee Method
RCRA	Resources Conservation and Recovery Act
RMAs	Routine Maintenance Agreements
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SBA	South Bay Aqueduct
SBC	Southwest Bell Communication
SCH	State Clearinghouse
SDA	Special Drainage Area Program
SFPUC	San Francisco Public Utilities Commission
SGP	Sycamore Grove Park
SHPO	State Historic Preservation Officer
SLIC	Spill, Leak, Investigations, and Cleanups

SMMP	Stream Management Master Plan
SPRR	Southern Pacific Railroad
STA	station
SVWTP	Sunol Valley Water Treatment Plant
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TOD	Transit Oriented Development
TRO	Telephone Radio Operator
UBC	Uniform Building Code
USFWS	U.S. Fish and Wildlife Service
UPRR	Union Pacific Railroad
USACE	see Corps
USACOE	see Corps
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
U.S. DOT	U.S. Department of Transportation
USGS	U.S. Geological Survey
WDR	Water Discharge Requirement
WMUDS	Waste Management Unit Discharge System
WTP	Water Treatment Plant
WY	Water Year
WSE	Water Surface Elevation.
WSPP	Water Supply Planning Program
Zone 7	Zone 7 Water Agency

Abbreviations Used in Tables

B	Beneficial Impact
LSM	Less than Significant Impact with Mitigation
LTS	Less than Significant
N	No Impact
PS	Potentially Significant
SU	Significant and Unavoidable

APPENDICES

APPENDIX A

NOP Comments

Report	SMMP EIR NOP		
Comment Number	55		
Comment Type	N/A	Section Number	N/A
Reach Number	N/A	Project Number	N/A
Commentor	Piarino, Paul		
Organization Name	Alameda County Water District		

Comment:

Dear Mr. O'Toole:

Subject: ACWD Comments on the Notice of Preparation for a Master EIR for the Zone 7 Stream Management Master Plan

Thank you for the opportunity to comment on the Notice of Preparation for Zone 7 Water Agency's Master Environmental Impact Report for the Stream Management Master Plan (MEIR). As you know, Alameda County Water District (ACWD) is a water retailer that provides potable water to a population of over 320,000 in the cities of Fremont, Newark and Union City. Although variable depending on hydrologic conditions, in past years, ACWD had relied on Alameda Creek to provide in excess of 30,000 acre-feet of local and imported water for groundwater replenishment. This water is percolated into the Niles Cone Groundwater Basin (downstream of the Niles Canyon) through percolation both in Alameda Creek Flood Control Channel and the adjacent Quarry Lakes project. The water is subsequently recovered through ACWD's groundwater production wells and provided as a potable supply to the District's customers. Because of the importance of this local resource, the protection of Alameda Creek, its tributaries, and the Alameda Creek Watershed to preserve and enhance water quality and supply is of utmost importance to ACWD.

Because ACWD's groundwater recharge facilities are located downstream of the Zone 7 service area and the proposed projects of the Stream Management Master Plan (SMMP), it is important for the MEIR to recognize the need to protect downstream water quality and water supply. The MEIR should identify and evaluate potential impacts to downstream water quality and supply as a result of projects implemented under the SMMP. For example, potential adverse impacts to water quality may occur as a result of increased recreation and public access to stream corridors. We recommend that Zone 7 directly coordinate with ACWD in the evaluation of potential impacts and the identification of appropriate mitigation. We also encourage Zone 7 to actively coordinate with other on-going Alameda Creek Watershed planning efforts, including the Alameda Creek Watershed Management Plan Steering Committee and the Fisheries Restoration Workgroup.

Thank you again for the opportunity to comment on the Notice of Preparation. If you have any questions regarding these comments, please contact Eric Cartright (Ext. 4206) or Jim Reynolds (Ext. 6511) at ACWD.

Paul Piraino
General Manager
Alameda County Water District

Response to Comment:

Report	SMMP EIR NOP		
Comment Number	62		
Comment Type	N/A	Section Number	N/A
Reach Number	N/A	Project Number	N/A
Commentor	Rainey, Ron		
Organization Name	Terra Law LLP/Hacienda Business		

Comment:

Re: ACFC & WCD Zone 7 Stream Management Master Plan MEIR

Ladies and Gentlemen:

This letter is in response to the Notice of Preparation of a Master Environmental Impact Report ("MEIR") for Alameda County Flood Control and Water Conservation District Zone 7's Stream Management Master Plan ("SMMP") implementation.

We represent the Hacienda Business Park Owner's Association ("HBP"). HBP has the following comments and suggestions for the MEIR. Most of the comments and suggestions are general, primarily regarding data sources, methods of analysis, and projections. HBP believes that, given the competition for infrastructure funding, the SMMP, including proposed floodwater control, must be quite accurate and broadly acceptable in order to justify and obtain the several hundred million dollars required for the projects proposed.

1. The "baseline", "current", or "no project" data must be carefully developed, particularly when these data are based upon or derive from data from other sources or prepared for other purposes. The baseline data should be consistent with previous data and planning techniques, or the differences detailed, to ensure that problems identified are not simply (1) the result of using different, but not necessarily more accurate, data than previous planning, or (2) the result of adapting data which are not as appropriate for flood control planning as data developed for that specific purpose. For a specific example, see comment 3 below.

2. It appears that most of the reports which the SMMP relied upon are "Draft" reports. Examples are the West Yost report and the Schaaf & Wheeler report. The MEIR should state whether these reports labeled as drafts are actually the final reports or whether further study or refinement were intended.

3. Important data for the SMMP is the "Current Flood Plain." The source of the current flood plain shown in the SMMP is not identified but it appears to be the Flood Plain map prepared by Federal Emergency Management Agency ("FEMA") in 1997. Similarly, the Buildout Flood Plain appears to be the FEMA 500 year Flood Plain. The MEIR should also discuss whether and to what degree the data and analysis underlying FEMA's mapping for its purposes is consistent with Zone 7's flood control planning. For example, does the FEMA buildout scenario incorporate such important facts as the encouragement by local agencies and regional water quality control board to have current development standards for projects in the area require that the development generate no net increase in peak water flow during storms. This is important since the stated basis for increased flow at buildout is the reduced permeability of developments' rooftops, parking lots, and streets.

4. Particular care should be used in describing potential problem areas. For example, describing an area as subject to flooding or having had significant flooding is too vague, giving little or no information about the severity of the problem. The descriptions of actual or potential problems should be more precise in describing the degree of the problem. For example, if "flooding" in an area or in an instance means that storm waters will for a limited time inundate portions of parking lots but structures and nearby streets would not be affected, the precise description should be used rather than the general. The general term can be unnecessarily alarming to property owners in the area or other people. In addition, understanding the severity of a problem is an important element in determining the priority of projects within Zone 7, within ACFC & WCD, and among government agencies generally.

5. In several instances, maps of Pleasanton area or descriptions of areas subject to problems may give the impression that Hacienda Business Park is within the 100-year flood plain.

6. The MEIR should consider improvements to the Bernal Avenue Bridge over the Arroyo de la Laguna among the alternatives to be examined. Similarly, some consideration should be given to other improvements to the Arroyo de la Laguna as alternatives to some of the projects.

7. It appears that in the underlying planning of the SMMP the relevant criteria is the 100-year event, rather than, for example the 15-year event. The MEIR should carefully examine how to transition from a previous planning criteria to a later planning criteria in order to avoid inconsistencies or problems in implementation of new projects into the older system.

Thank you for your consideration to these comments.

Very truly yours,
Terra Law LLP

Ron Rainey

Response to Comment:

Report	SMMP EIR NOP		
Comment Number	66		
Comment Type	N/A	Section Number	N/A
Reach Number	N/A	Project Number	N/A
Commentor	Sable, Timothy		
Organization Name	Department of Transportation		

Comment:

Zone 7 Stream Management Plan - NOP

Thank you for including the California Department of Transportation (Department) in the early stages of the environmental review process for the Stream Management Plan Project. The comments presented below are based on the Notice of Preparation.

Traffic Analysis

The information detailed below should be included in the Traffic Study to ensure that project-related impacts to State roadway facilities are thoroughly assessed. We encourage the City to coordinate preparation of the study with our office, and we would appreciate the opportunity to review the scope of work. The Department's "Guide for the Preparation of Traffic Impact Studies" should be reviewed prior to initiating any traffic analysis for the project; it is available at the following website:
<http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf>

The Traffic Study should include:

1. Site plan clearly showing project access in relation to nearby state roadways. Ingress and egress for all project components should be clearly identified. *State right-of-way (ROW) should be clearly labeled.*
2. Project-related trip generation, distribution, and assignment. The assumptions and methodologies used to develop this information should be detailed in the study, and should be supported with appropriate documentation.
3. Average Daily Traffic, AM and PM peak hour volumes and levels of service (LOS) on all significantly affected roadways, including crossroads and controlled intersections for existing, existing plus project, cumulative and cumulative plus project scenarios. Calculation of cumulative traffic volumes should consider all traffic-generating developments, both existing and future, that would affect study area traffic and degradation to existing and cumulative levels of service. Lastly, the Department's LOS threshold, which is the transition between LOS C and D, and is explained in detail in the Guide for Traffic Studies, should be applied to all state facilities.
4. Schematic illustration of traffic conditions including the project site and study area roadways, trip distribution percentages and volumes as well as intersection geometrics, i.e., lane configurations, for the scenarios described above.
5. The project site building potential as identified in the General Plan. The project's consistency with both the Land Use and Circulation Elements of the General Plan as well as Alameda County's Congestion Management Plan should be evaluated.
6. Mitigation should also be identified for any roadway mainline section or intersection with insufficient capacity to maintain an acceptable LOS with the addition of project-related and/or cumulative traffic. The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should also be fully discussed for all proposed mitigation measures.

Highway Capacity Manual

While the 2000 Highway Capacity Manual (HCM) may not be the preferred level of service methodology, it should be used for analyzing impacts to state facilities, particularly where previous analysis employing alternative methodologies has identified impacts. The residual level of service, assuming mitigation has been implemented, should also be analyzed with HCM 2000.

Encroachment Permit

Work that encroaches onto the State ROW requires an encroachment permit that is issued by the Department. To apply, a completed encroachment permit application, environmental documentation, and five (5) sets of plans, clearly indicating State ROW, must be submitted to the address below. Traffic-related mitigation measures will be incorporated into the construction plans during the encroachment permit process. See the following website link for more information:
<http://www.dot.ca.gov/hq/traffops/developserv/permits/>

Sean Nozzari, District Office Chief
Office of Permits
California DOT, District 4
PO Box 23660
Oakland, CA 94623-0660

Please feel free to call or email Patricia Maurice of my staff at (510) 622-1644 or patricia_maurice@dot.ca.gov for more information, or with any questions regarding this letter.

Sincerely,

Timothy C. Sable
District Branch Chief
IGR/CEQA

Response to Comment:

Report	SMMP EIR NOP		
Comment Number	65		
Comment Type	N/A	Section Number	N/A
Reach Number	N/A	Project Number	N/A
Commentor	Frost, Susan		
Organization Name	City of Livermore		

Comment:

Re: Notice of Preparation for a Master EIR for the Zone 7 Stream Management Master Plan

Dear Mr. O'Toole,

Thank you for the opportunity to comment on the Notice of Preparation (NOP) for the Master Environmental Impact Report (MEIR) for the Zone 7 Water Agency Stream Management Master Plan (SMMP).

As indicated in the NOP, a MEIR is proposed for the Zone 7 SMMP. The purpose of the SMMP is to develop a master plan that addresses flood protection and drainage issues, as well as other issues affecting management of streams and arroyos within a 39 square mile area of the larger Alameda Creek watershed. The study area has been divided into 12 study reaches. Reaches 1 through 6 cover the City of Livermore and surrounding areas.

A MEIR, under the provisions of Public Resources Code Section 21157 and CEQA Guidelines Section 15175, may be prepared for a variety of projects, including a project that consists of smaller individual projects that will be carried out in phases, or a rule or regulation that will be implemented by subsequent projects. A MEIR is intended to eliminate, or reduce scope of, environmental review of subsequent discretionary activities or projects whose environmental effects are addressed in the MEIR. Therefore, a MEIR is required to include a description of subsequent projects that would be within the scope of the Master EIR that contains sufficient information with regard to the kind, size, intensity, and location of the subsequent projects. A Master EIR is also required to identify the potential impacts of anticipated subsequent projects for which there is not sufficient information reasonably available to support full assessment of potential impacts in the MEIR.

The Phase I Interim Report for the SMMP includes an extensive list of proposed projects within Reaches 1 through 6. Many of these projects, such as the Arroyo Seco Bridge Improvement, are described in sufficient detail to allow for thorough analysis of the potential environmental impacts and identification of mitigation measures. However, a number of projects, such as the Airway Improvement Project, are not described in detail at this time. To this end, City comments on the SMMP will describe updates and corrections needed to various projects.

As a Responsible Agency for many of the projects in Reaches 1 through 6, the level of environmental analysis in the MEIR for those projects is of particular concern to the City. Projects anticipated to be covered by the scope of the MEIR, thereby reducing or eliminating subsequent environmental review, should be described in detail and the potential environmental impacts identified and mitigated where feasible.

The following are comments relating to specific topic areas to be included in the MEIR.

Public Plans and Policies

The City of Livermore recently completed an update to its General Plan. The 2003 General Plan, adopted in February 2004, contains several goals, objectives, policies and actions relating to flood control, storm water management and habitat protection. Relevant excerpts from the General Plan are attached. Coordination among Zone 7, City of Livermore, and other relevant agencies is vital to maintaining consistency with City goals relating to flood control, storm water management, and habitat protection. In addition, the City's Bikeways and Trails Master Plan includes a number of existing and proposed multi-use trails along the arroyos and providing additional trail opportunities is of high policy importance to the City. The City is also in the process of updating its Storm Drain Master Plan with completion scheduled for this summer. Consistency between the City's master plans and the SMMP should also be addressed in the MEIR.

Biological Resources

The SMMP proposes a broad range of stream and flood control improvements that cover a large geographic area. The potential impacts to wildlife habitat are rare and endangered species are extensive. Implementation of the projects will require coordination with a variety of agencies, including the California Department of Fish and Game, US Fish and Wildlife Service, and the Regional Water Quality Control Board. A regional mitigation plan should be considered to address the constraints of project implementation imposed by endangered species.

One particular area of concern is the proposed projects in Reach 5 in the vicinity of the proposed Isabel/I-580 Interchange. The City is coordinating with Caltrans and the Federal Highway Administration in design and implementation for the proposed interchange. Potential impacts to Arroyo Las Positas are being assessed and mitigation measures proposed and incorporated into the interchange design. Coordination among the projects proposed by Zone 7 and mitigation measures and design elements for the new interchange is necessary.

to ensure that the goals for flood control and habitat protection and mitigation are realized.

Alternatives

The NOP does not identify alternatives to be considered in the MEIR. The City would like the opportunity to coordinate with Zone 7 on the development of alternatives for the proposed SMMP in both a broader programmatic approach and for individual projects, as appropriate.

Of particular concern is the No Project Alternative required by CEQA. The Interim Phase I Report indicates that extensive flooding potential exists now and at buildout affecting the Livermore Municipal Golf Course and Municipal Airport. The proposed regional flood project and individual projects in Reaches 5 and 6 are intended to address this issue. However, the environmental impacts to City facilities of not implementing these projects under a No Project Alternative should be thoroughly analyzed in the MEIR.

The City will be submitting separate comments on the SMMP Interim Phase I Report to Zone 7. City staff is readily available to provide assistance to Zone 7 and ESA during the preparation of the MEIR and completion of the SMMP and both Engineering and Planning Divisions staff have been assigned liaison responsibilities on this important project. Please contact Susan Frost, Principal Planner, at (925) 960-4450 with any questions regarding the above comments or other assistance we can provide.

Sincerely,

Susan Frost
Principal Planner

Response to Comment:

Report	SMMP EIR NOP		
Comment Number	77		
Comment Type	N/A	Section Number	N/A
Reach Number	N/A	Project Number	N/A
Commentor	Fairfield, Ted		
Organization Name	Ted Fairfield		

Comment:

1. The Description of "the project", for EIR purposes, should largely consist of the amendment of the Zone 7 master drainage/flood control plan; i.e., abandonment of the 1966 master plan and criteria, and adoption of new SMMP criteria, along with an analysis thereof - including an analysis of the affects of imposing the new "plan" on the largely completed flood control system - already constructed in accordance with the 1966 plan.
2. In this sense, the EIR must, among other things, look at the level of flood control and drainage "protection" that would be afforded by completion of the 1966 master plan work, as compared with the protection that would be provided by the proposed SMMP.
3. Perhaps the best way of dealing with these issues is to use the 1966 master plan as an "alternative to the proposed project," and do the same amount of detailed engineering work and detailed reporting on that alternative as has been done on the SMMP proposal, along with a comparative benefit/cost analysis at the end of this exercise.
4. This effort needs to include such things as:
 - A. Revising the criteria to essentially do away with the long-standing freeboard requirements; i.e., to newly define "success" as merely keeping the 100 year storm within the top of banks, with no freeboard. (This is a hard case to defend, in contradiction of many years of the tradition and accepted standards in the design of major flood control facilities.)
 - B. Abandonment of the concept of and need for passage of a "standard project flood", which concept is an intengral part of the 1966 plan, and which concept also has been a long tradition in the design of major flood control facilities.
 - C. Abandonment of a "gravity" concept; i.e., proposing flood walls and pumping stations to facilitate drainage of large parts of Pleasanton during major storms.
 - D. Reliance upon a detention pond concept that has not been demonstrated to be capable of dealing safely with back to back major storms; i.e., even back to back storms of less than 100 year return frequency.
5. "Challenge #3", on page S4-8 (figure 4.4) merely "kisses off" the potential completion of compliance with the channel improvements contained in the 1966 master plan. But, this is beign done with merely a "statement of faith"; i.e., without detailed analysis and proof of the validity/correctness and necessity of that conclusion. And, without evaluation of the cost/benefit/regulatory aspects of this rather blithe conclusion. This is a major aspect; i.e., a pivotal decision in the project consideration, and must be dealt with candidly and with substantial engineering and economic analysis.

Response to Comment:

Report	SMMP EIR NOP		
Comment Number	44		
Comment Type	N/A	Section Number	N/A
Reach Number	N/A	Project Number	N/A
Commentor	Yee, Dexter		
Organization Name	Zone 7 Water Agency		

Comment:

Flood Control's review comments of the NOP are as follows:

1. The tables of project summaries are very specific and some of the project components may not be feasible.

If the EIR does not address the effects of alternative project approaches (ie. Installation of A-jacks or riprap instead of the specified "rock vanes"), additional environmental documents are required.

Suggestion: Can the project summaries be reformatted to be more general and vague and yet address the most probable effects? Or perhaps the project components could suggest several alternatives to address the project purposes.

There is concern that the implementation of the projects would be hindered by specific approaches.

2. Section 5.1 Implementation Schedule

Is the "20 Years" time period accurate? The last master plan was 40+ years.

"...design and permitting activities for individual projects are anticipated to be completed on a two-year timeframe..." 2 to 4 time frame would be more realistic because of the regulatory obstacles and right of way issues.

"...construction activities being implemented during the 6 month dry season." Construction activities (ie. Trails.), not regulated by DFG can be implemented in a 9 + month period. Other projects regulated by DFG may be implemented over a series of 6 month dry seasons.

3. Section 5.2 Right-of-Way Issues/Permits Required

Right-of-Way issues were not addressed.

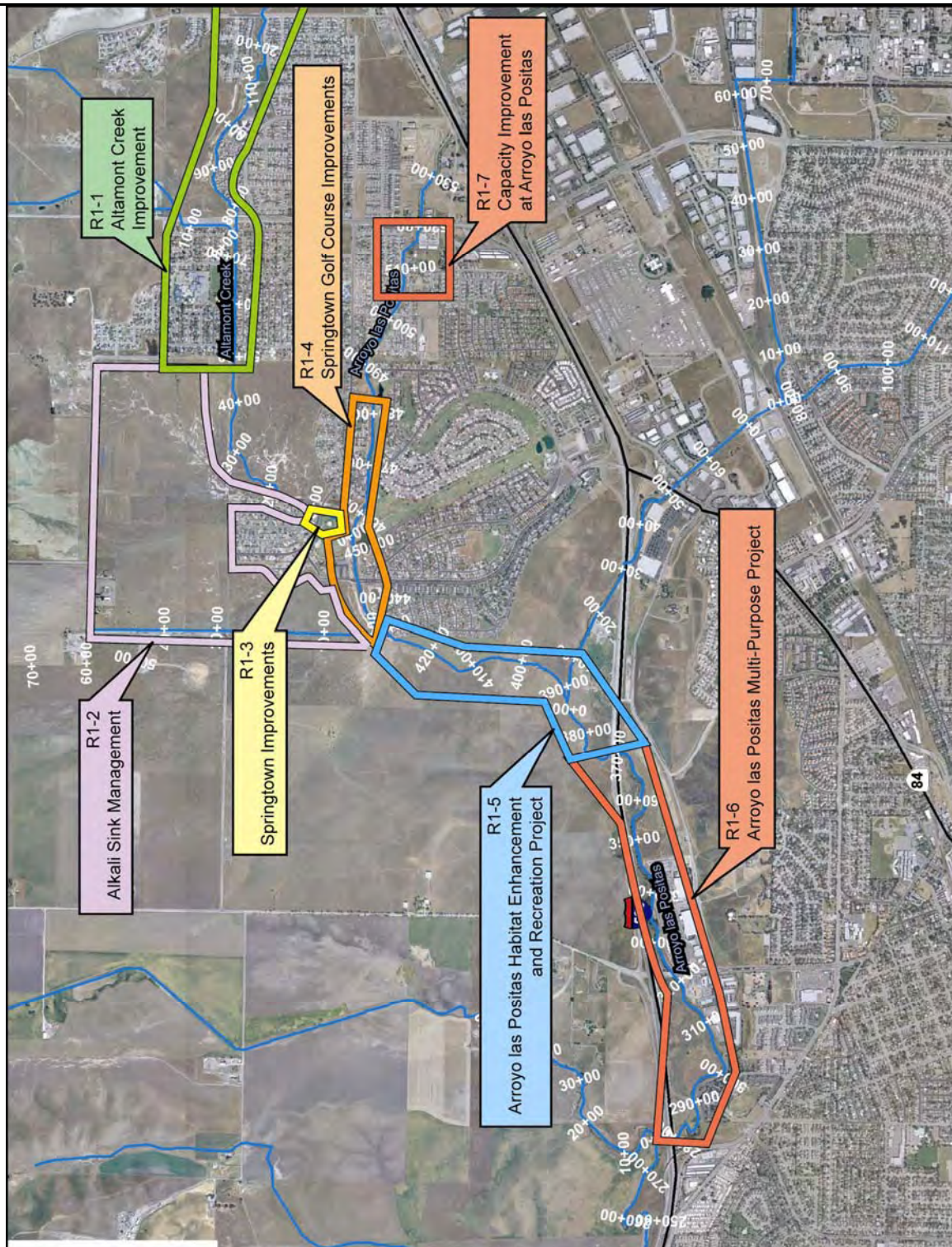
Response to Comment:

Comments forwarded to ESA on April 26, 2004. ESA incorporated comments as needed. Comments most relevant to SMMP Interim Report.

APPENDIX 2.0

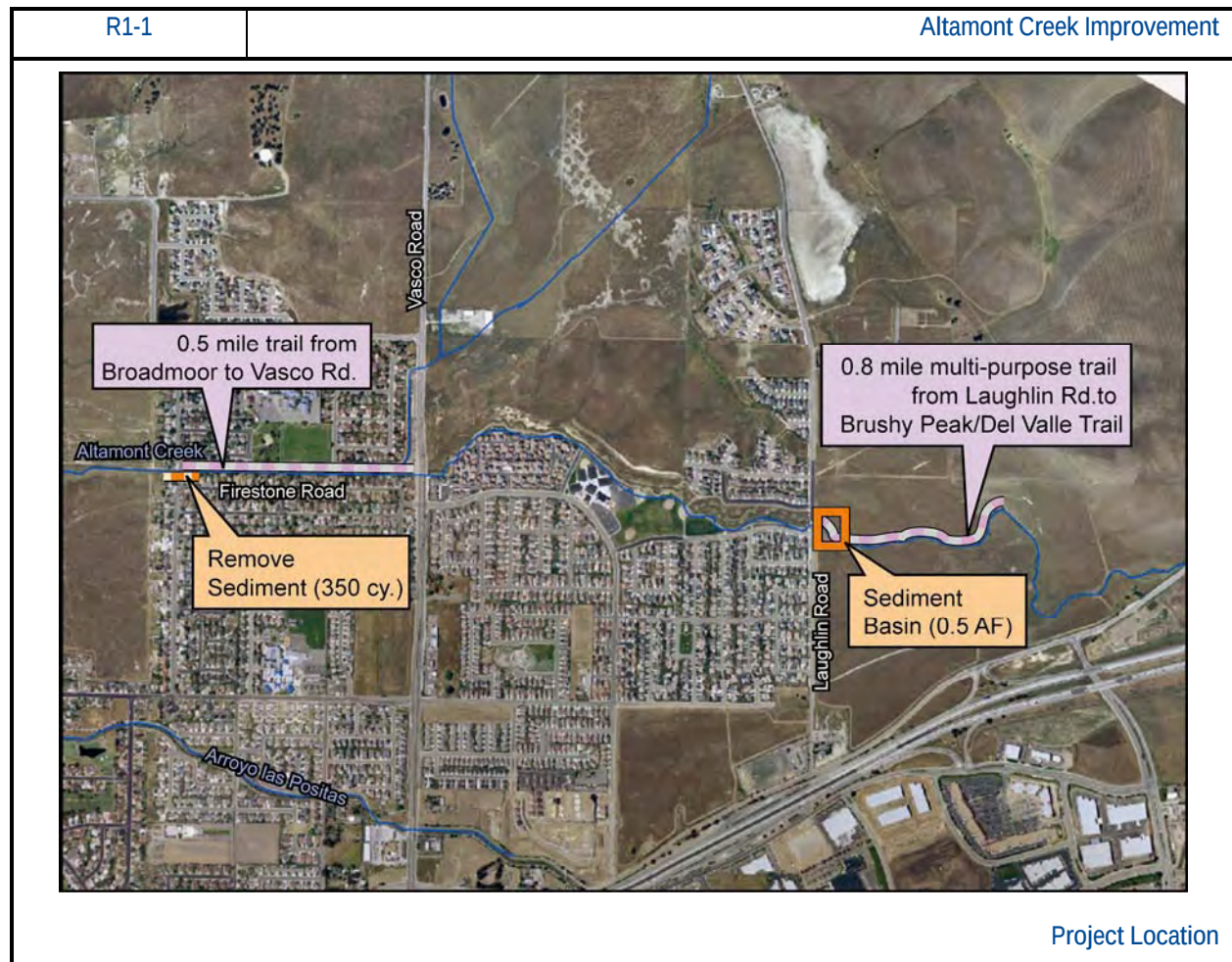
Project Description

Reach 1 Summary Map



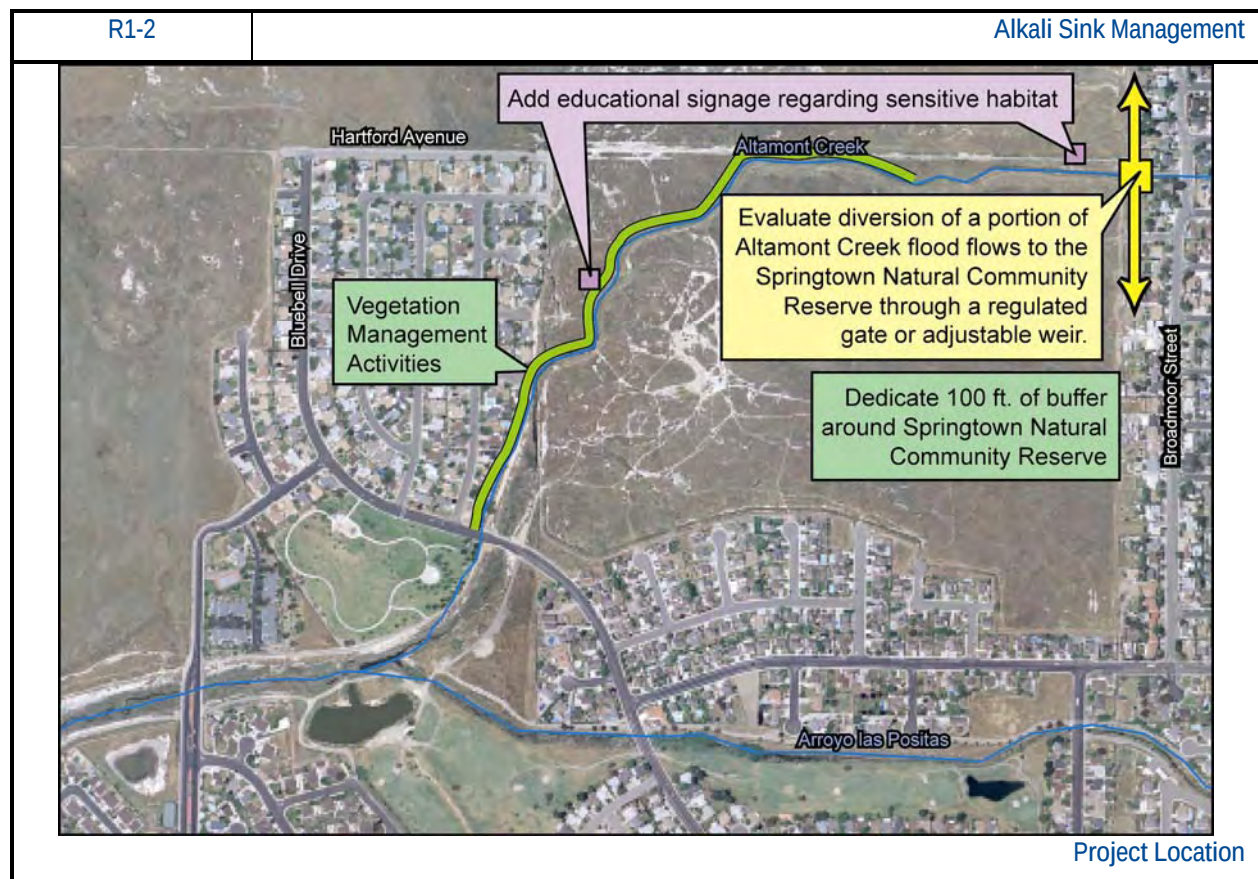
Project Number	R1-1
Project Name	Altamont Creek Improvement
Project Location	Altamont Creek between Brushy Peak/Del Valle Trail and Laughlin Road (STA 145+00 to 125+00). Altamont Creek between Vasco Road and Broadmoor Street (STA 75+00 to 50+00).
Purpose	Create a system of regional trails and provide connectivity between existing trails.
Project Components	1. Construct a 0.5 mile trail from Broadmoor Street to Vasco Road. 2. Construct a 0.8 mile multi-purpose trail from Laughlin Road to Brushy Peak/Del Valle Trail. The project includes acquisition of 1.4 acres for the trail component. 3. Conduct sediment management activities including: • Constructing a sediment basin in Altamont Creek just upstream of the Laughlin Road crossing. Sediment basin size estimated at 0.50 acre-feet (AF). The trail proposed under Project R.1-1 from Laughlin Road to Brushy Peak could be used as an access road for the sediment basin. The project includes acquisition of 0.5 acres for the sediment basin. • Removing sediment along 145 feet of Altamont Creek to restore the channel capacity. Sediment removal to be conducted immediately upstream and downstream of the Broadmoor Street crossing (approximately 350 CY). The project includes creation of 1.2 acres of wetlands as environmental mitigation for sediment management activities.
Capital Cost Estimate	\$3,360,000
Implementation Issues	• Coordination with the City of Livermore and the Livermore Area Recreation and Park District (LARPD) • Regulatory approval required for culvert arroyo/cantilever trail proposed between Broadmoor and Vasco Rd • Need to evaluate sediment sources and implement sediment management program before initiation of project • High habitat value for the special status species (bird's peak, California red legged frog, and California tiger salamander) • Permitting in compliance with Clean Water Act (CWA) Sections 401/404 • Coordination with Department of Fish and Game, and U.S. Fish and Wildlife Service
Project Precursors	There is a need to evaluate sediment issues through preparation of a Geomorphic Analysis and a subsequent Sediment Management Study for Altamont Creek, Arroyo las Positas, and Line S.
Project Benefits	• Provide trail connectivity along Altamont Creek from confluence with Arroyo las Positas to Brushy Peak. • Restores a more natural stream hydrology in Altamont Creek.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: C Water Supply: none Water Quality: C Habitat & Environment: E Recreation, Trails, and Public Education: C, D
Maintenance Activities	Maintenance of trails: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed. Maintenance of sediment basin: • Conduct field inspections of the sediment basin. • Conduct sediment sampling prior to sediment removal and prepare Sediment Characterization Report. • If desilting activities are conducted in a "wet stream", conduct water quality

	sampling prior to and after sediment removal. Prepare a Water Quality Sampling Plan. • Dewater site if desilting activities are conducted in a "wet stream". Conduct desilting activities. • Store and transport dredged material to an off-site landfill facility. • Conduct mitigation for sediment removal activities.
Annual Maintenance Cost Estimate	\$96,000
Notes	• Identified as a high priority project (ranked 13 of 52) in City of Livermore Bikeways and Trails Master Plan (December 2001). • One-time sediment removal at the Broadmoor Street crossing to be conducted in conjunction with the construction of the sediment basin upstream of Laughlin Road. • Recommendation based on field visit triggered by Zone 7 comments and a West Yost Associates reference.
References	• City of Livermore Bikeways and Trails Master Plan, Wilbur Smith Associates, December 11, 2001 • Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 • Communication with Zone 7 Water Agency, 2003



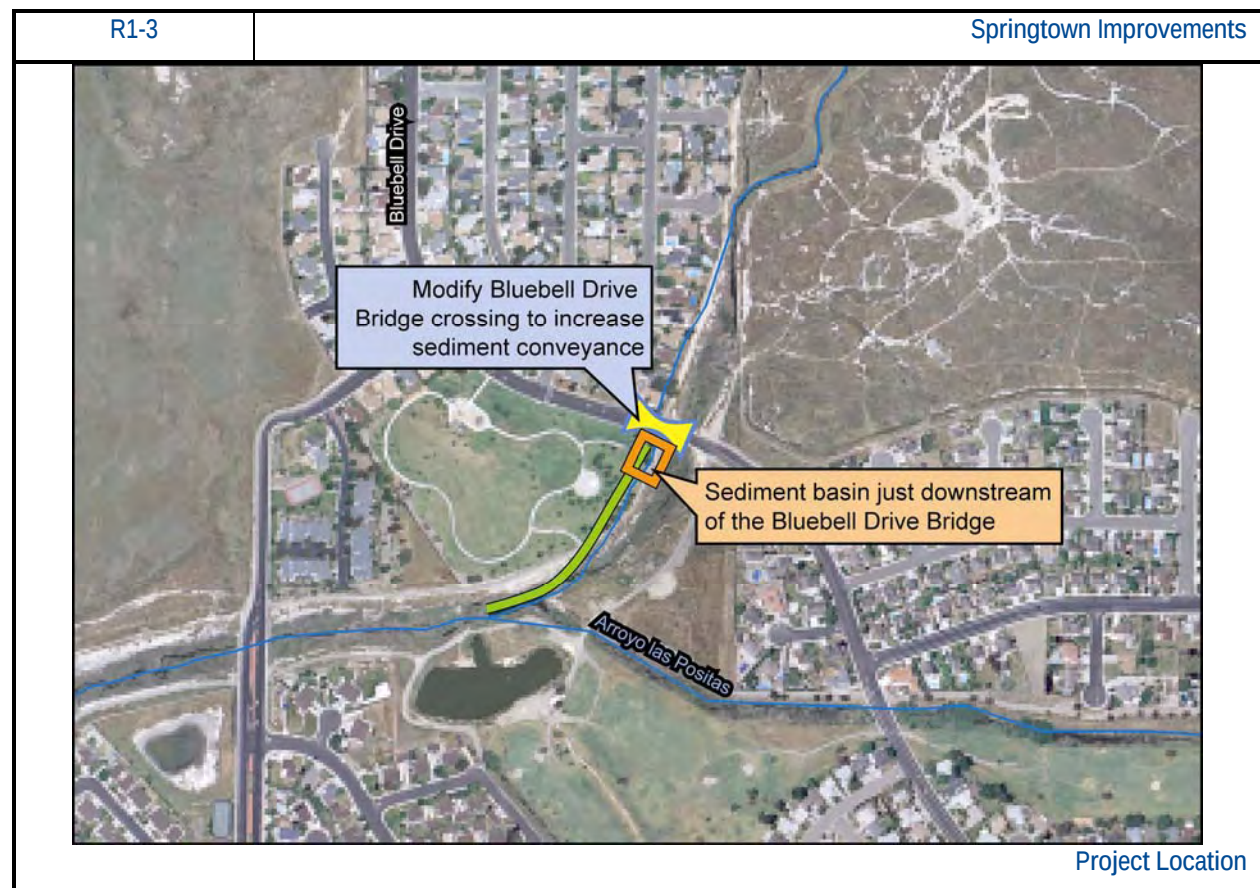
Project Number	R1-2
Project Name	Alkali Sink Management
Project Location	Along Altamont Creek, from Broadmoor Street to the confluence of Arroyo las Positas (STA 50+00 to 10+00).
Purpose	This project will protect and enhance the natural habitat in the preserve.
Project Components	1. Dedicate 100 feet of buffer around the Springtown Natural Community Reserve (approximately 100 feet x 1 mile = 12 acres). 2. Construct a regulated gate or adjustable weir to divert a portion of Altamont Creek flood flows into the Springtown Natural Community Reserve. 3. Install additional educational signage/kiosk (2) regarding the preservation of the bird's beak habitat. 4. Conduct vegetation management activities including invasive species control along 2,500 feet of both banks of Altamont Creek (STA 35+00 to 10+00).
Capital Cost Estimate	\$4,745,000
Implementation Issues	• Permitting issues associated with special status species • Permitting in compliance with CWA Sections 401/404 • Coordinate projects with resource agencies (RWQCB, CDFG, USFWS, etc.) due to the area designation as proposed critical habitat for the Red-Legged Frog. Coordination with County Mosquito Abatement District. • Coordination with City of Livermore, County of Alameda, and US Bureau of Reclamation • Coordination with project biologists and regulatory agencies regarding flooding impacts on resident endangered species
Project Precursors	• Develop an Alkali Sink Management Plan to understand the impact of diverting flows to Alkali Sink. • Evaluate diversion of a portion of Altamont Creek flood flows to alkali sink through regulated gate or adjustable weir.
Project Benefits	• Minimizes impacts of land use development on alkali habitat. • Provides flood protection to areas downstream of the Springtown Natural Community Reserve.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: B, C, D Recreation, Trails, and Public Education: B, E
Maintenance Activities	Inspect regulated gate or adjustable weir during wet weather flows. Develop a monitoring plan to identify changes in alkali sink habitat due to project implementation. A pre-project survey should be conducted to determine the baseline condition of the area. After project implementation, a survey of observed hydrologic regime, soil, and presence or absence of vernal pools or other special status species should be conducted annually to monitor the success of the project. Vegetation Maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on hand removal of riparian vegetation. • Collect and dispose of vegetation debris. Interpretive kiosk: • Inspect signage on an annual basis to make sure it is still in the appropriate

	location and legible.
Annual Maintenance Cost Estimate	\$119,000
Notes	• The Springtown Natural Communities Reserve includes areas of alkali sink scrub vegetation and vernal pools that support many special status species including bird's beak and California tiger salamander. • Improvements to the Alkali Sink will be implemented as appropriate, based on the latest scientific findings and studies of the site including the Questa Engineering hydrologic analysis study conducted in November 1998. Livermore has noted that some water recirculation is occurring from the creek to the Alkali Sink Area. • The buffer area may be greater than 100 feet, based on the biological value of the reserve. • Design of the regulated gate should consider western pond turtle and associated habitat. • Development of the Alkali Management Plan is critical to understanding the impacts of diverting water back into the reserve and proper management of the Alkali sink.
References	Existing Conditions and Sensitivities/Constraints Analysis for Arroyo Las Positas Stream Corridor Management Plan Phase I, Questa Engineering Corporation, March 1998

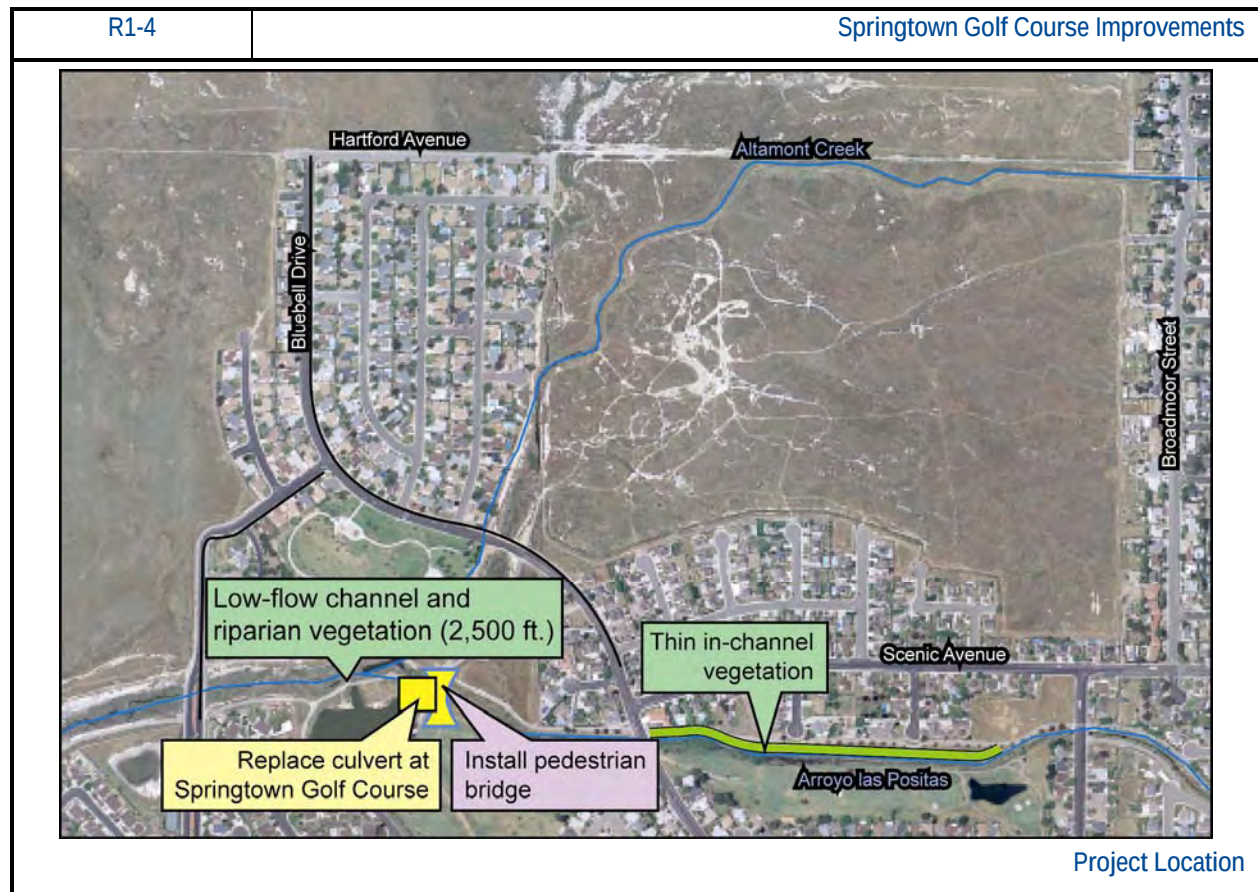


Project Number	R1-3
Project Name	Springtown Improvements
Project Location	Altamont Creek from Bluebell Drive to the confluence with Arroyo las Positas (STA 10+00 to 0+00).
Purpose	Curtail aggradation of Altamont Creek by trapping sediment loads from upstream in a sediment basin. Decrease potential for flooding in the vicinity of Bluebell Bridge during a 100-year flood event.
Project Components	1. Construct a sediment basin in Altamont Creek just downstream of the Bluebell Drive Bridge. Sediment basin size estimated at 2.75 acre-feet. Project includes creation of approximately 1.4 acres of wetlands as environmental mitigation for creation of sediment basin. 2. Modify bridge at Bluebell Drive crossing to increase sediment conveyance at bridge crossing. 3. Conduct vegetation management activities including invasive species control along 1,000 feet of Altamont Creek (STA 10+00 to 0+00).
Capital Cost Estimate	\$2,710,000
Implementation Issues	• Traffic impacts associated with modification of the bridge at the Bluebell Drive crossing. • Permitting issues associated with potential construction impacts to special-status species such as bird's peak, California tiger salamander, and California red-legged frog. • Permitting in compliance with CWA Sections 401/404 • Coordination with resource agencies (RWQCB, CDFG, etc.) and the City of Livermore • Coordination with the City of Livermore, the County of Alameda, and the U.S. Bureau of Reclamation on the proposed drainage plans for protection and restoration of the historic hydrologic functions of the Springtown Alkali Sink. • Coordination with County Mosquito Abatement District
Project Precursors	• Evaluate need for a sediment basin based on results of project R.1-3 Springtown Improvements Phase I and drainage modifications proposed for the restoration of the Springtown Alkali Sink • Evaluate land use operations in upstream watershed to determine the effect on supply and transport of sediment into the stream. • Evaluate need for bridge modification at Bluebell Drive crossing based on results of project R.1-1 Springtown Improvements Phase I. • Sediment or hydraulic modeling required to aid in size determination of sediment basin.
Project Benefits	• Reduces sediment accumulation into Altamont Creek • Limits disturbance related to sediment removal activities to a specific location • Incorporates management measures into Altamont Creek operations • Conveys the 100-year flood event at Bluebell Drive Bridge • Minimizes impacts on habitat
Goals/Objectives Addressed	Flood Protection & Drainage: A, B, E Erosion and Sedimentation: C Water Supply: none Water Quality: C Habitat & Environment: C, E Recreation, Trails, and Public Education: none
Maintenance Activities	Maintenance of Sediment Basin: • Conduct field inspections of the sediment basin. • Conduct sediment sampling prior to sediment removal and prepare Sediment Characterization Report. • If desilting activities are conducted in a "wet stream", conduct water quality sampling prior to and after sediment removal. Prepare a Water Quality Sampling Plan.

	• Dewater site if desilting activities are conducted in a "wet stream". Conduct desilting activities. • Store and transport dredged material to an off-site landfill facility. • Conduct mitigation for sediment removal activities. Vegetation Maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on hand removal of riparian vegetation. • Collect and dispose of vegetation debris.
Annual Maintenance Cost Estimate	\$240,000
Notes	• Monitor Springtown Phase I Improvements • The Springtown Phase II project improvements will be implemented as appropriate based on the Springtown Phase I monitoring results.
References	• Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 • Existing Conditions and Sensitivities/Constraints Analysis for Arroyo Las Positas Stream Corridor Management Plan Phase I, Questa Engineering Corporation, April 1998



Project Number	R1-4
Project Name	Springtown Golf Course Improvements
Project Location	Springtown Golf Course along Arroyo las Positas from Heather Lane to the confluence with Altamont Creek (STA 490+00 to 430+00)
Purpose	Implement improvements to protect the Springtown Golf Course from flooding during a 100-year flood event.
Project Components	1. Replace double culvert barrel at Arroyo las Positas crossing with pedestrian bridge at Springtown Golf Course. 2. Create a low-flow meandering channel (assuming a meandering ratio of 1.5) on Arroyo las Positas from STA 455+00 to 430+00 (2,500 feet) to enhance habitat for special-status species. 3. Conduct in-stream vegetation management activities (recurring), including invasive species control and riparian vegetation planting at Arroyo las Positas for 3,500 feet (STA 490+00 to 455+00). Includes acquisition of 1.2 acres of stream for vegetation management. 4. Conduct vegetation management activities (recurring), including invasive species control and riparian vegetation planting at Arroyo las Positas for 2,500 feet (STA 455+00 to 430+00).
Capital Cost Estimate	\$2,170,000
Implementation Issues	• High habitat value for the special status species (bird's peak, California red legged frog, and California tiger salamander) • Permitting in compliance with Clean Water Act (CWA) Sections 401/404 • Coordination with the City of Livermore and the Livermore Area Recreation & Park District (LARPD) for trail development • Coordination with Department of Fish and Game, and U.S. Fish and Wildlife Service
Project Precursors	-
Project Benefits	• Addresses flooding upstream of culvert into golf course. • Improves Arroyo las Positas flood conveyance capacity by thinning out in-stream vegetation.
Goals/Objectives Addressed	Flood Protection & Drainage: A, E Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: B, C, E Recreation, Trails, and Public Education: none
Maintenance Activities	In-stream vegetation management: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on chemical clearing of invasive species which includes conducting a biological survey and implementing a water quality sampling plan. • Collect and dispose of vegetation debris.
Annual Maintenance Cost Estimate	\$137,000
Notes	Culvert replacement is listed in the City of Livermore's 20-year Capital Improvement Plan. Implementation of project will be conducted with coordination with the City of Livermore.
References	• Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 • City of Livermore 20-Year Capital Improvement Plan, 2004 • Communication with Zone 7 Water Agency, 2003

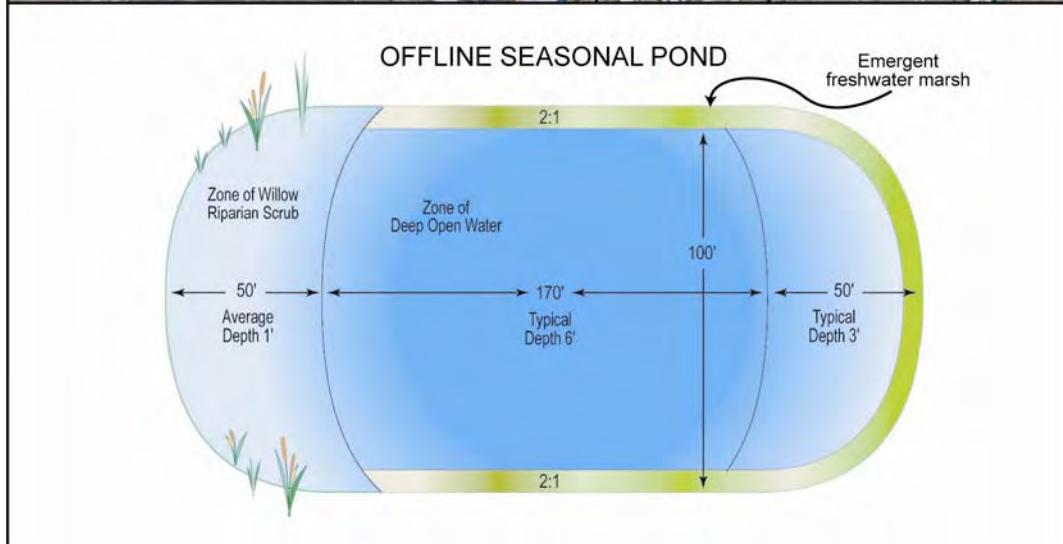
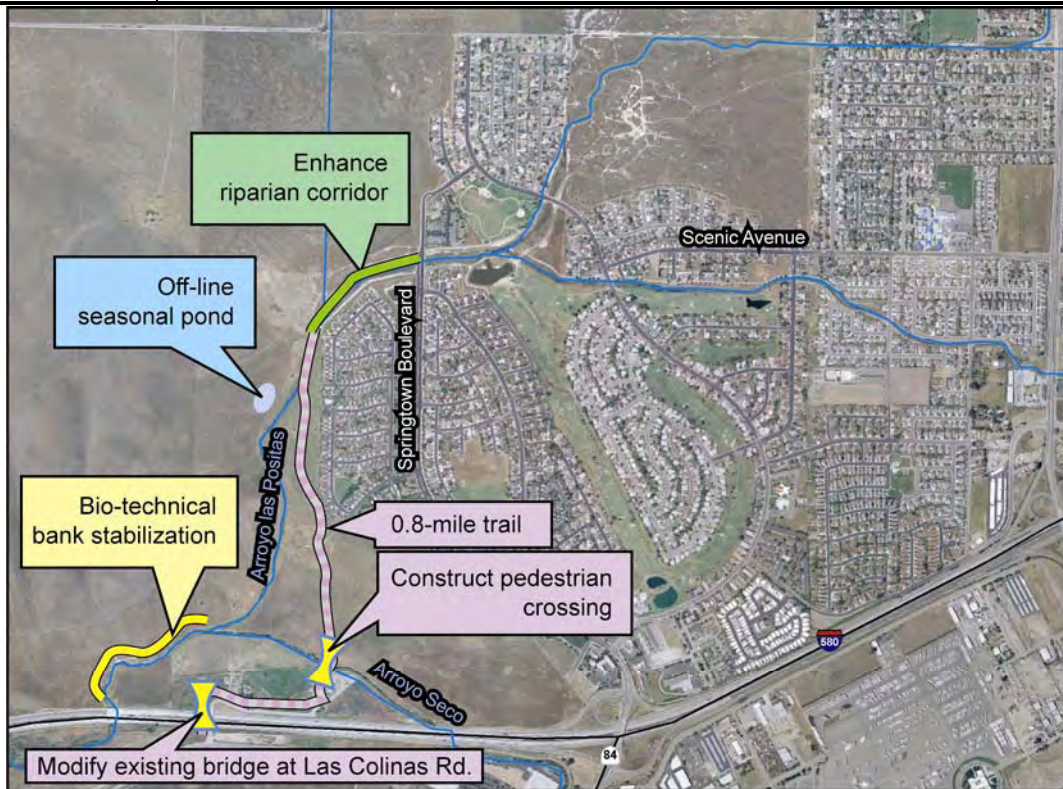


Project Number	R1-5
Project Name	Arroyo las Positas Habitat Enhancement and Recreation Project
Project Location	Along Arroyo las Positas north of I-580 and south of Springtown Avenue (STA 430+00 to 385+00).
Purpose	Create a system of regional trails. Enhance upland and riparian habitat along Arroyo las Positas.
Project Components	1. Implement trail enhancement projects including: • Construction of 0.8 miles of trail parallel to Arroyo las Positas from Las Colinas Road to Springtown Avenue including: • Construction of one pedestrian bridge across Arroyo Seco; and • Modification of I-580 pedestrian crossing at Las Colinas Road. • Acquire 1.9 acres of land for trail. 2. Enhance 2.8 acres of riparian corridor by filling gaps in riparian vegetation using alkali plant elements in addition to classic riparian vegetation, from STA 430+00 to 410+00 (approximately 30 feet on each bank along 2,000 feet). Project includes acquisition of 2.8 acres for vegetation management. 3. Implement habitat enhancement projects including: • Off-line seasonal ponds at STA 420+00 to create habitat for the California Red Legged Frog and California Tiger Salamander. Specific measures will be implemented to limit mosquito breeding in seasonal ponds. • Install fencing along project perimeter (approximately 1,070 feet) to exclude cattle from the 1-acre pond and improve success of restoration efforts. • Acquire 1 acre of land for pond and buffer area. 4. Construct bio-technical bank stabilization utilizing methods such as live cribwalls, live fascines, brush mattresses, or joint plantings (2,500 feet from STA 385+00 to 360+00). Project includes acquisition of 1.7 acres of land for bank stabilization.
Capital Cost Estimate	\$9,120,000
Implementation Issues	• Coordinate trail construction with construction of the proposed school at confluence of Arroyo las Positas and Arroyo Seco • Permitting in compliance with CWA Section 401/404 • Coordination with resource agencies (RWQCB, CDFG, etc.) on habitat creation • Coordination with proposed school to develop an Adopt-a-Creek Program • Coordination with the City of Livermore and LARPD • Coordination with County Mosquito Abatement District to address issues with mosquito breeding in seasonal ponds • Zone 7 purchase of right-of-way is necessary for enhancement implementation
Project Precursors	-
Benefits	• Enhances upland habitat for special status species including the California Red Legged Frog and California Tiger Salamander. • Provides trail connectivity between the proposed trail south of I-580 and the existing trail along Altamont Creek.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: A Water Supply: none Water Quality: C Habitat & Environment: B, C Recreation, Trails, and Public Education: A, B, D
Maintenance Activities	1. Maintenance of trails: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed. 2. Vegetation maintenance:

	• Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on chemical clearing of invasive species which includes conducting a biological survey and implementing a water quality sampling plan. • Collect and dispose of vegetation debris. 3. Maintenance of off-line seasonal ponds: • Develop a monitoring plan including pre- and post-project biological surveys to identify presence or absence of special-status species to monitor the success of the project. 4. Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed.
Annual Maintenance Cost Estimates	\$158,000
Notes	• Development of an Adopt-a-Creek Program needs to be coordinated with the proposed school to be located at the confluence of Arroyo las Positas and Arroyo Seco. • Terracing can be evaluated as an alternative to bio-technical methods of stabilization
References	• Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 • City of Livermore Bikeways and Trails Master Plan, Wilbur Smith Associates, December 11, 2001

R1-5

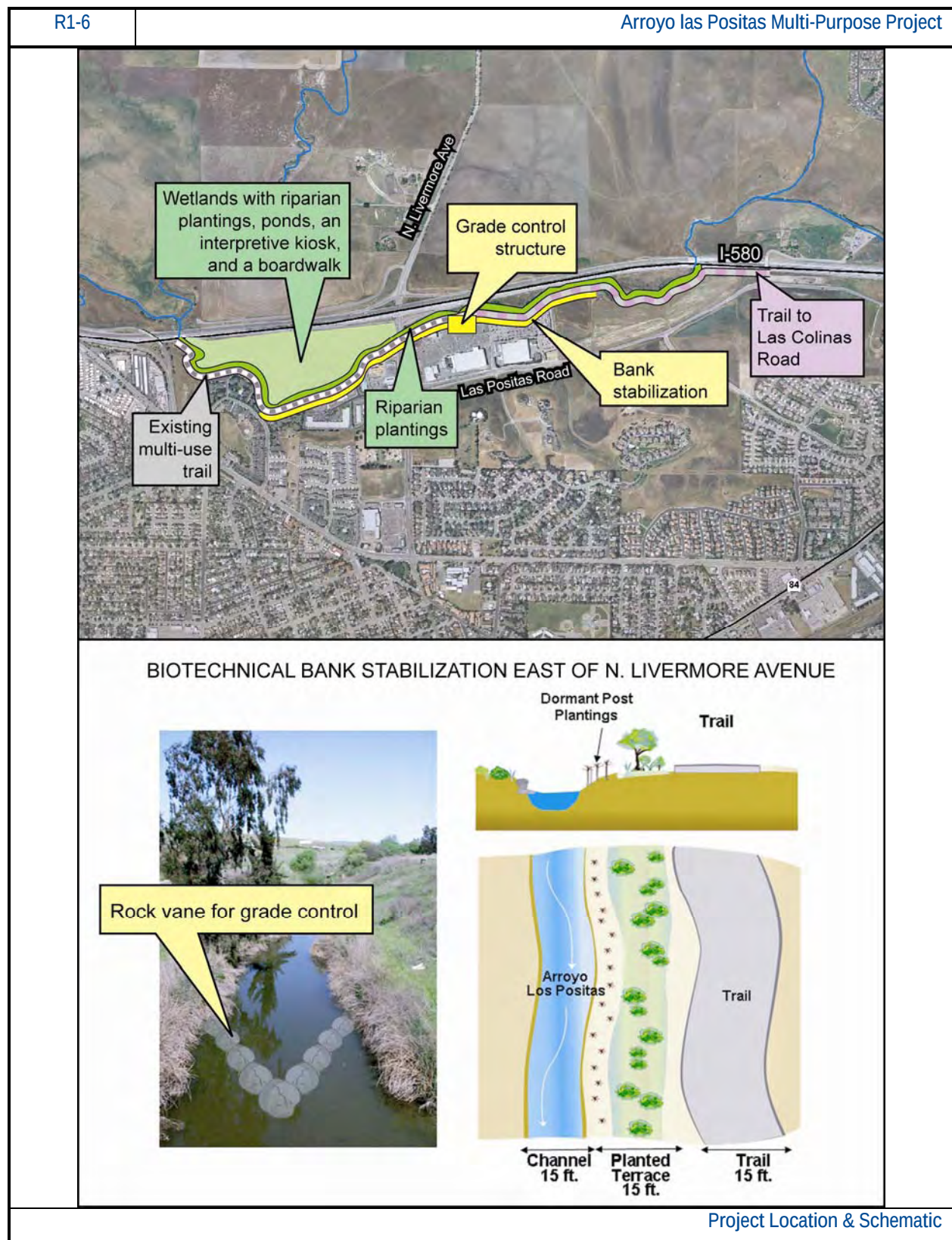
Arroyo las Positas Habitat Enhancement and Recreation Project



Project Location & Schematic

Project Number	R1-6
Project Name	Arroyo las Positas Multi-Purpose Project
Project Location	Arroyo las Positas along I-580 (STA 360+00 to 280+00)
Purpose	Address in-stream and bank erosion along Arroyo las Positas. Create wetland to protect and enhance water quality and habitat. Provide connectivity between existing trail sections along Arroyo las Positas.
Project Components	1. Stabilize channel banks by: • Constructing bio-technical bank protection including dormant post plantings along Arroyo las Positas (STA 350+00 to 300+00) • Constructing bio-technical bank protection along Arroyo las Positas where washout occurred. 2. Stabilize channel bed by constructing a grade control structure such as a rock vane at STA 330+00. 3. Construct 4,000 ft of multi-use trail along Arroyo las Positas from North Livermore Avenue to Las Colinas Road (proposed trail in R.1-6) (STA 360+00 to STA 320+00). The trail will include one road crossing at North Livermore Avenue (including 1 traffic signal and signage). Project includes acquisition of 1.8 acres of land for trail. 4. Construct wetlands, including: • Wetlands West of North Livermore Avenue (approximately 20 acres between STA 320+00 and 285+00). Wetlands include land acquisition, excavation, and riparian plantings. • Interpretive kiosk. • Approximately 3,000 feet of boardwalk.
Capital Cost Estimate	\$32,110,000
Implementation Issues	• Permitting in compliance with CWA Section 401/404 • Coordination with the City of Livermore, LARPD, and County Mosquito Abatement District
Project Precursors	• Evaluate need for construction of grade control structure at STA 330+00 based on the monitoring results of the Springtown Improvement Project (R.1-3). • Arroyo Plaza II project implemented by Signature Properties during summer 2003 (STA 350+00 – 365+00) and includes: • Buried windrow of rip-rap placed behind channel banks in locations found to be susceptible to erosion; and • Approximately 2,000 feet of multi-use trail along stream.
Project Benefits	• Provides connectivity between existing trail sections along Arroyo las Positas from STA 280+00 to 325+00 and from STA 350+00 to 360+00. • Addresses bank erosion in unstable section of Arroyo las Positas. • Addresses bed degradation in unstable section of Arroyo las Positas. • Enhances habitat for special-status species along stream. • Improves water quality in Arroyo las Positas through wetland construction along creek.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: A Water Supply: none Water Quality: B, C Habitat & Environment: C, D Recreation, Trails, and Public Education: B, C, D, E
Maintenance Activities	Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Maintenance of trails: • Conduct annual inspection of trails.

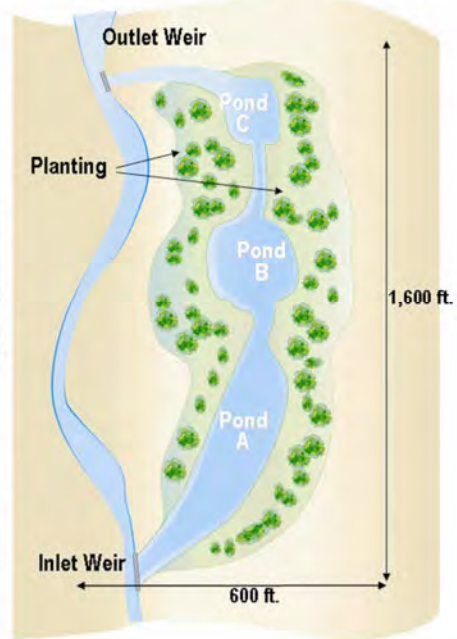
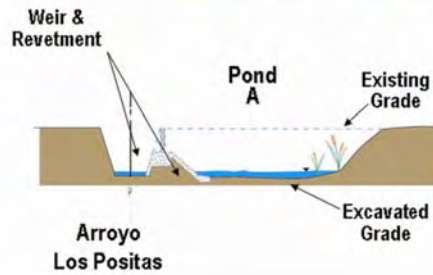
	- Seal cracks and repair pavement on trails, as needed. - Clear debris and vegetation growth, as needed. - Repair signs and structures, as needed. Maintenance of wetlands: - Conduct annual visual estimates of vegetative cover and species composition to estimate vegetative cover, species diversity, presence or absence of target and invasive species, and general abundance of individual plant species. Identify species survival rate. - Replace wetland vegetation, as needed, to maintain at least 50% surface area coverage after second growing season. - Conduct hand weeding of exotic plant species during the first three years to ensure there is no interference with the development and establishment of target wetland plant species. - Conduct annual routine maintenance activities including access road maintenance, and debris removal.
Annual Maintenance Cost Estimate	\$358,000
Notes	- Terracing can be evaluated as an alternative to bio-technical methods of stabilization. - The trail from Arroyo Plaza II to North Livermore Ave is planned for construction in spring 2006. CEQA documents are underway and are expected to be complete by July 2005. Measure B Bike and Pedestrian Funds were received to implement the project.
References	- Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 - Personal communication with Zone 7 Water Agency staff, August 2003 - Personal communication with Joel Waxdeck (City of Livermore), April 2005



R1-6

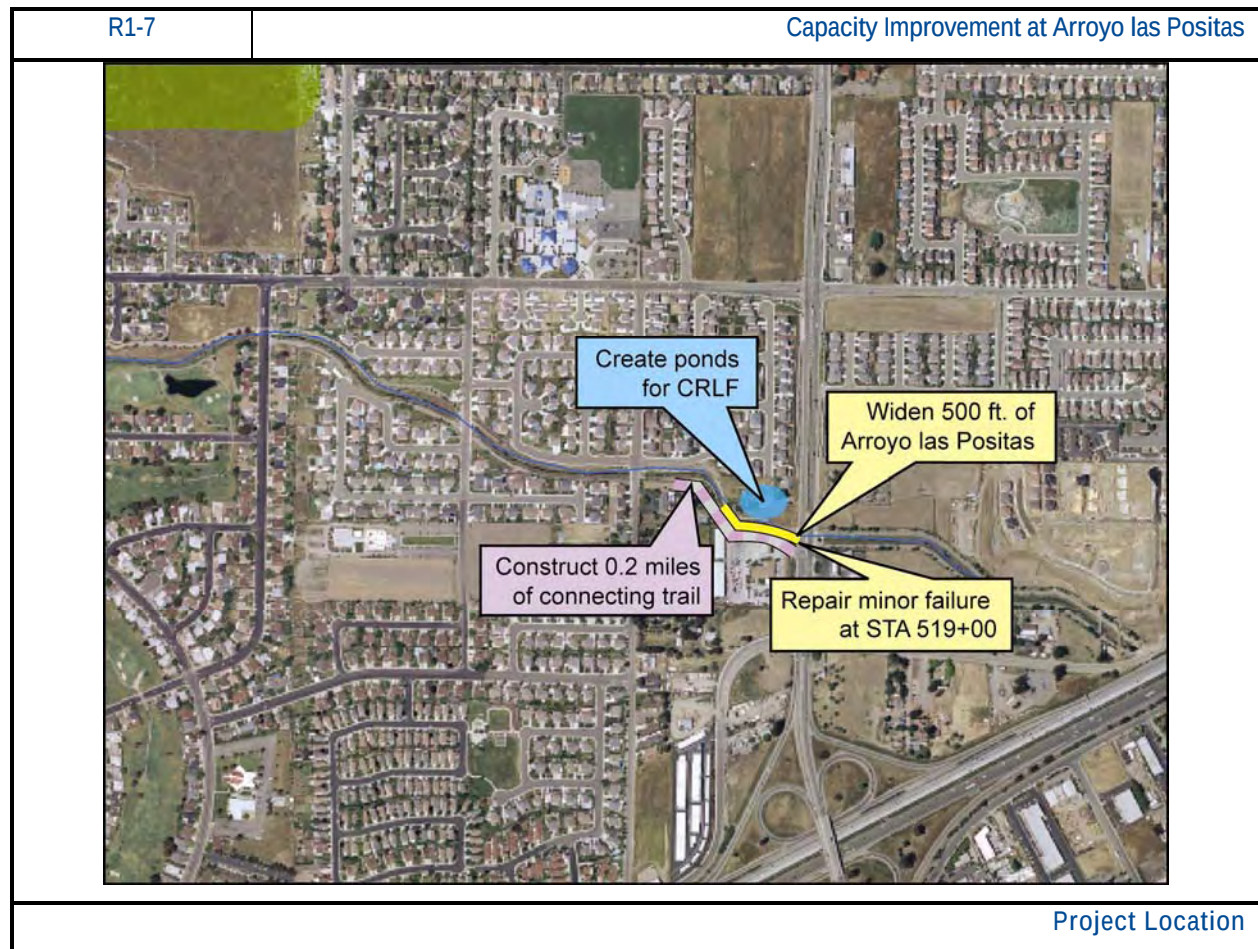
Arroyo las Positas Multi-Purpose Project

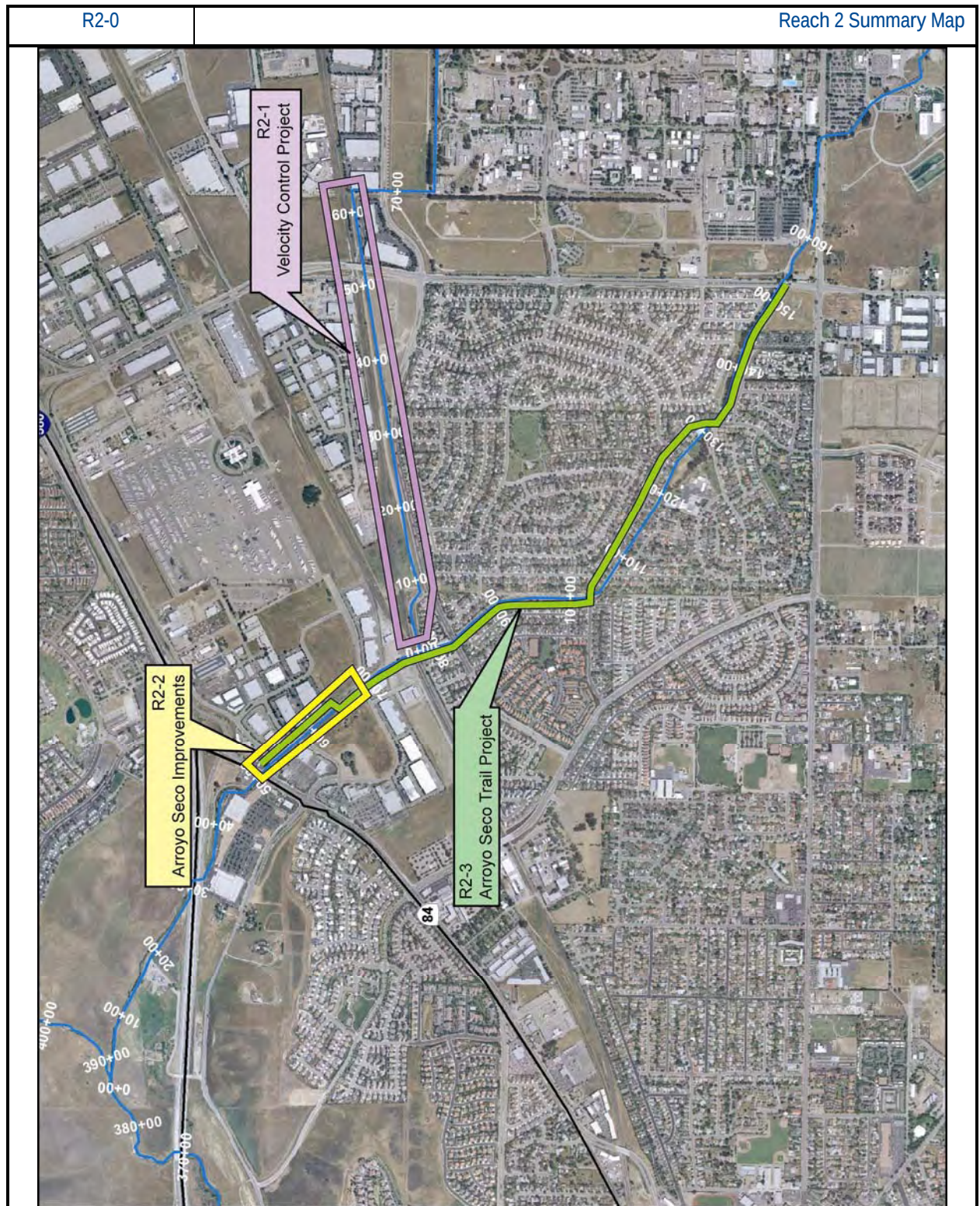
ARROYO LAS POSITAS WETLAND WEST OF N. LIVERMORE AVENUE

Potential
Wetland
Location

Project Schematic

Project Number	R1-7
Project Name	Capacity Improvement at Arroyo las Positas
Project Location	Arroyo las Positas, immediately west of Vasco Road (STA 520+00 to 515+00)
Purpose	Increase the channel capacity of an undersized 500-foot reach of Arroyo las Positas so it equals the capacity of the reach immediately east of Vasco Road. Link the existing trail along Lobelia Way to the trail running along the north bank of Arroyo las Positas, immediately east of Vasco Road.
Project Components	1. Widen channel to geometry of upstream reach of Arroyo las Positas (immediately west of Vasco Road). Project includes acquisition of 0.11 acres of land for channel widening. Project also includes creation of 0.14 acres of wetlands as environmental mitigation for channel widening. 2. Repair a minor bank failure along the south bank of Arroyo las Positas (STA 518+00). 3. Construct a 0.2 mile trail from Lobelia Way to the existing trail running along the north bank of Arroyo las Positas and starting immediately east of Vasco Road. Project includes acquisition of 0.2 acres for trail. 4. Create off-line seasonal ponds to create habitat for the California Red Legged Frog and California Tiger Salamander. Specific measures will be implemented to limit mosquito breeding in seasonal ponds. Project includes acquisition of 0.5 acres of land for pond and buffer area.
Capital Cost Estimate	\$1,250,000
Implementation Issues	• Coordination with the City of Livermore and the Livermore Area Recreation and Park District (LARPD). • Permit coordination
Project Precursors	Zone 7 to coordinate with the City of Livermore on Right-of-Way along a 500-foot stretch of Arroyo las Positas.
Project Benefits	• Provide trail connectivity along Arroyo las Positas • Address local flooding issues
Goals/Objectives Addressed	Flood Protection & Drainage: B, C Erosion and Sedimentation: A Water Supply: none Water Quality: none Habitat & Environment: D Recreation, Trails, and Public Education: C, D
Maintenance Activities	Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Maintenance of trails: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$12,000
Notes	Project recommended by Zone 7.
References	-



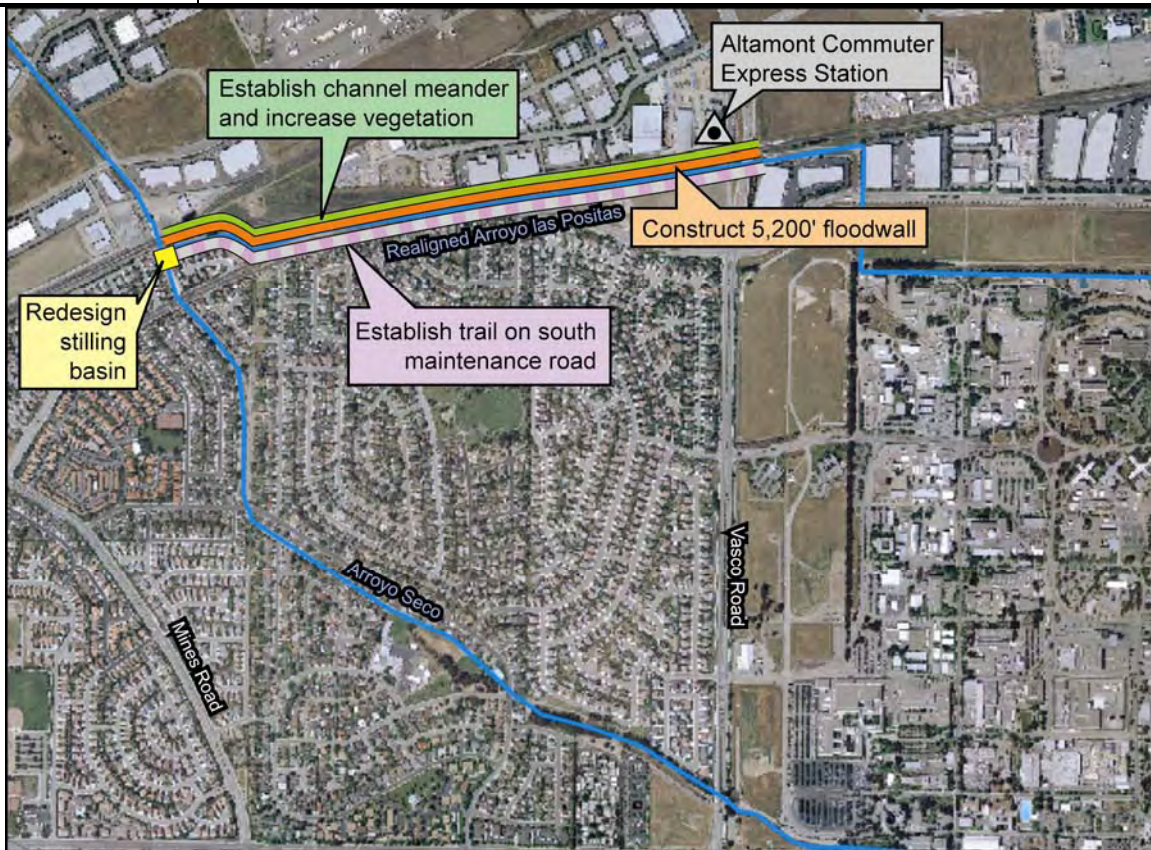


Project Number	R2-1
Project Name	Velocity Control Project
Project Location	Realigned Arroyo las Positas, from confluence with Arroyo Seco to Patterson Pass Crossing (STA 62+00 to 0+00)
Purpose	• Flood protection along Realigned Arroyo las Positas. • Address in-stream and bank erosion due to high velocity flood flows. • Create links to regional trails.
Project Components	1. Construct 5,200 feet long, 4 feet high floodwall along the south bank of Realigned las Positas from confluence with Arroyo Seco (STA 0+00) to Shelley Street (STA 52+00). 2. Construct velocity/erosion control measures (STA 62+00 to 10+00), including: • Channel meander along 5,200' of Realigned Arroyo las Positas channel. Channel meander dimensions are 7,800 feet (1.25 x existing channel length of 5,200 feet). • Rock vane downstream of channel meander. • Reconfiguration of concrete weir stilling basin to provide better energy dissipation. • Increased vegetation along the channel sloped and banks. 3. Establish 5,300 feet of trail on existing south maintenance road from Vasco Road (STA 53+00) to confluence with Arroyo Seco (STA 0+00) to be linked to Regional Trails Project R.2-3.
Capital Cost Estimate	\$19,390,000
Implementation Issues	• Space constraints and potential utility conflicts. • Permitting in compliance with CWA Section 401/404. • Special-status species permit coordination. • Coordination with City of Livermore and LARPD on trail development. • This area designated as critical habitat for CRLF.
Project Precursors	• Hydrologic/hydraulic/geomorphic modeling.
Project Benefits	• Remove area along realigned Arroyo las Positas from FEMA 100-year flood zone. • Reduces erosion. • Improves riparian conditions through re-vegetation. • Provides regional trail connectivity. • In combination with Regional Trails Project R.2-5, provides non-vehicular travel between neighborhoods, transit centers (Altamont Commuter Express Vasco station), and job centers.
Goals/Objectives Addressed	Flood Protection and Drainage: B, C, D Erosion and Sedimentation: A, C Water Supply: none Water Quality: C Habitat & Environment: A Recreation, Trails, and Public Education: C, D, G

Maintenance Activities	• Vegetation Maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on hand removal of riparian vegetation. • Collect and dispose of vegetation debris. • Trail Maintenance: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$95,000
Notes	• The area is designated as proposed critical habitat for California Red-Legged Frog. • Velocity control structures and other construction work will be designed to protect special-status species, including California Red-Legged Frog.
References	• City of Livermore Bikeways and trails Master Plan, Wilbur Smith Associates, December 11, 2001. • Special Drainage Area 7-1 Fee Structure Update, Schaaf & Wheeler, June 30, 2000.

R2-1

Velocity Control Project



Project Location

Project Number	R2-2
Project Name	Arroyo Seco Improvements
Project Location	Arroyo Seco from First Street crossing to Las Positas Road (STA 68+00 to 50+00)
Purpose	Allow Arroyo Seco to convey 100-year flows at built-out conditions.
Project Components	- Construct floodwalls, including: 1 feet-high walls along the three bridges to provide adequate freeboard under built-out conditions. The floodwall along First Street Bridge would be on its south side. Floodwalls along the Southfront and Arroyo Vista bridges would be on both sides. There would be a total of five walls built along the three bridges. 1,530 feet of 2 feet high floodwall along the east bank of Arroyo Seco between First Street and Las Positas Road. - Repair the existing levees along the east bank of Arroyo Seco between the Southfront Road and Arroyo Vista bridges. Repair work would be conducted along 500 feet of levees. - Perform limited plantings of native species to provide cover and shade through reach. Conduct vegetation planting along 1,400 feet of levee. - Construct bio-technical bank stabilization along 1,400 feet of stream on both banks.
Capital Cost Estimate	\$3,320,000
Implementation Issues	- Coordination with Caltrans and the City of Livermore on design and implementation of improvements. - Permitting in compliance with CWA Section 401/404. - Special-status species permitting coordination.
Project Precursors	- City of Livermore General Plan update. - Model capacity of individual bridges. The need for the proposed improvements will depend on results of modeling study.
Project Benefits	- Reduces flooding damage and liability. - Provides regional trail connectivity. - Increases habitat value through riparian plantings.
Goals/Objectives Addressed	Flood Protection and Drainage: B, C, D, E Erosion and Sedimentation: A Water Supply: none Water Quality: none Habitat & Environment: C Recreation, Trails, and Public Education: none
Maintenance Activities	- Levee Maintenance: - Conduct annual inspection - Repair levee as needed - Vegetation Maintenance: - Conduct annual inspection of planted riparian vegetation. - Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on hand removal of riparian vegetation. - Collect and dispose of vegetation debris.

Annual Maintenance Cost Estimate	\$119,000
Notes	• This project has been revised to account for reduced future development as per Livermore's General Plan. • Improvements will be designed to include protection for special-status species, including CRLF.
References	• Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 • City of Livermore General Plan 2003-2005, February 2004

R2-2

Arroyo Seco Improvements



Project Location

Project Number	R2-3
Project Name	Arroyo Seco Trail Project
Project Location	Along Arroyo Seco from Charlotte Way to First Street (STA 130+00 to 30+00)
Purpose	Create a system of regional trails.
Project Components	1. Upgrade 6,000 feet of maintenance road to trail along Arroyo Seco (STA 105+00 to 45+00). 2. Conduct bike trail touch-ups on existing bike trails along Arroyo Seco from the first to the second Charlotte Way crossings (STA 130+00 to 110+00). 3. Construct a cantilever bridge to route the Arroyo Seco trail over the railroad tracks. 4. Install two signs for safety at each side of the cantilever bridge. 5. Construct a cantilever bridge over Re-aligned Arroyo las Positas (STA 0+00) to tie-in to Arroyo Seco trail. 6. Acquire approximately 0.35 acres of land for bike trail touch-ups (2,000 feet x 8 feet).
Capital Cost Estimate	\$1,650,000
Implementation Issues	• Coordinate with Southern Pacific to obtain permissions to cross railroad right of way (ROW). • Coordination with LARPD, the City of Livermore and other agencies with responsibility over public safety.
Project Precursors	• Develop liability and use agreement for use existing maintenance roads as trails.
Project Benefits	• Provides regional trail connectivity. • In combination with the Velocity Control Project R.2-2, provides non-vehicular travel between neighborhoods, transit centers (Altamont Commuter Express Vasco station), and job centers. • Increases public awareness of streams.
Goals/Objectives Addressed	Flood Protection and Drainage: none Erosion and Sedimentation: none Water Supply: none Water Quality: none Recreation, Trails, and Public Education: C, D, F, G
Maintenance Activities	• Trail Maintenance: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$30,000

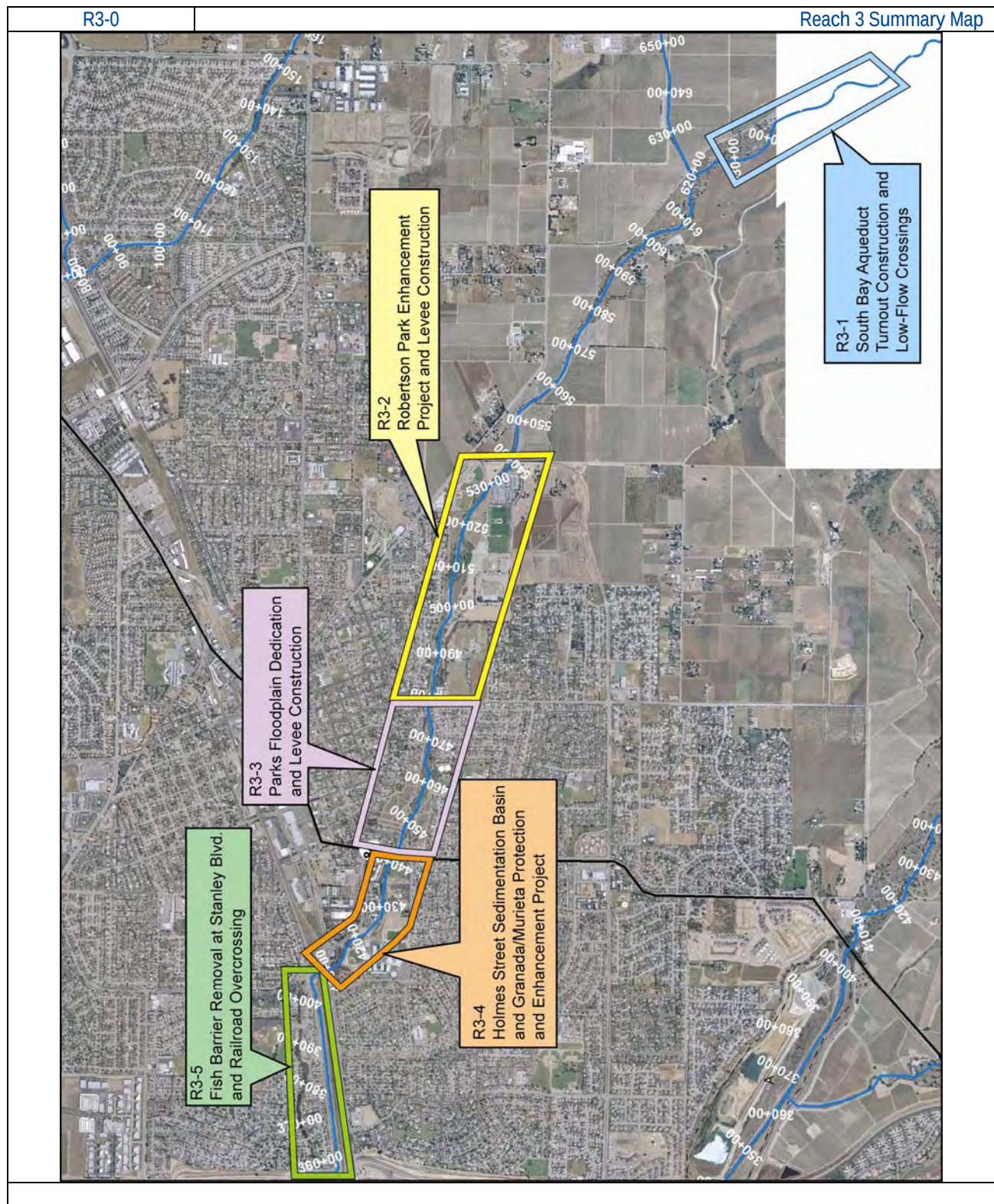
Notes	• Construction of the trail section along Arroyo Seco, from the Arroyo Vista Bridge to the First Street Bridge should be coordinated with Arroyo Seco Bridge Improvement project R.2-4. • Trails should be designed to be ADA compliant in order to qualify for grant money available for trails development. • Evaluate possibility of establishing a signaled crossing across the railroad tracks.
References	• Arroyo Management Plan, Kent Watson & Associates, March 1985 • Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001

R2-3

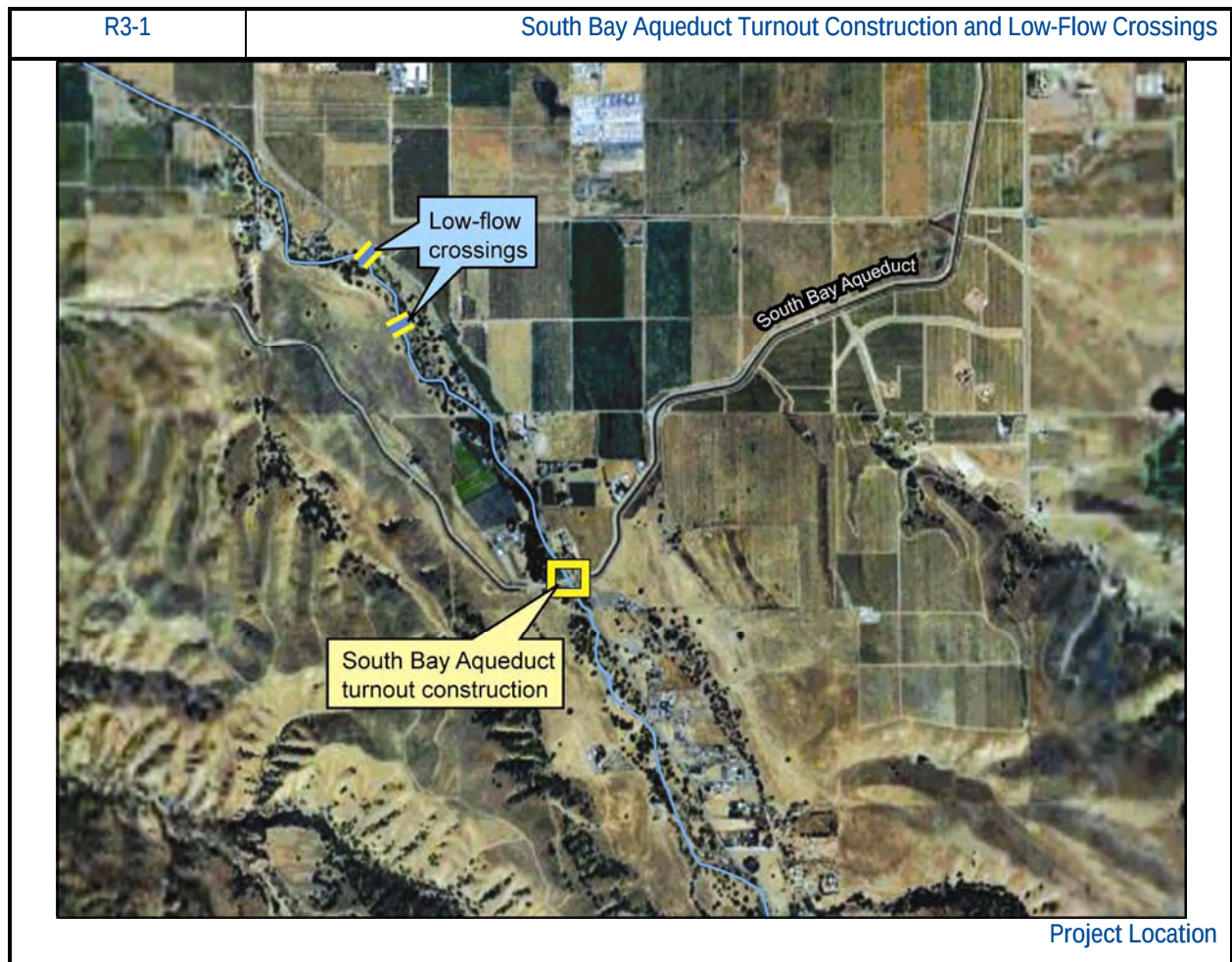
Arroyo Seco Trail Project



Project Location



Project Number	R3-1
Project Name	South Bay Aqueduct Turnout Construction and Low-Flow Crossings
Project Location	Arroyo Mocho from the South Bay Aqueduct (SBA) to STA 636+00
Purpose	This project proposes to increase groundwater recharge along Arroyo Mocho by constructing a turnout to transfer water from the SBA. The project also includes construction of two low-flow crossings along Arroyo Mocho.
Project Components	1. Construction of SBA turnout (STA 672+00) 2. Replace existing low-flow crossing (residential driveway) at 3949 Mines Road with an elevated ford design crossing (approximately 100 feet by 12 feet in width) 3. Replace existing low-flow crossing (residential driveway) at 4351 Mines Road with an elevated ford design or clear span crossing (design and dimensions to be determined)
Capital Cost Estimate	\$1,230,000
Implementation Issues	• Coordination with the Department of Water Resources • Potential permitting issues for compliance with Clean Water Act Sections 401/404 • Coordination with residents for driveway replacement
Project Precursors	Hydraulic/hydrologic modeling and capacity studies
Project Benefits	• Provides additional flexibility for the Zone 7 Stream Recharge Program • Provides additional capacity to accommodate water from the SBA • Incorporates public outreach and education component
Goals/Objectives Addressed	Flood Protection and Drainage: none Erosion and Sedimentation: none Water Supply: B, E, F Water Quality: none Habitat & Environment: A Recreation, Trails, and Public Education: none
Maintenance Activities	• Inspect SBA turnout annually • Conduct annual routine maintenance activities including crossing maintenance, and debris removal
Annual Maintenance Cost Estimate	\$35,000
Notes	Arroyo Mocho contributes significantly to groundwater recharge, especially downstream of the intersection with the SBA. Arroyo Mocho will be increasingly used as a recharge channel as part of the Zone 7 Artificial Stream Recharge Program.
References	• Personal communication with David Lunn, Zone 7 Water Agency, 2003 • Email communication with Matt Katen, Zone 7 Water Agency, 2005

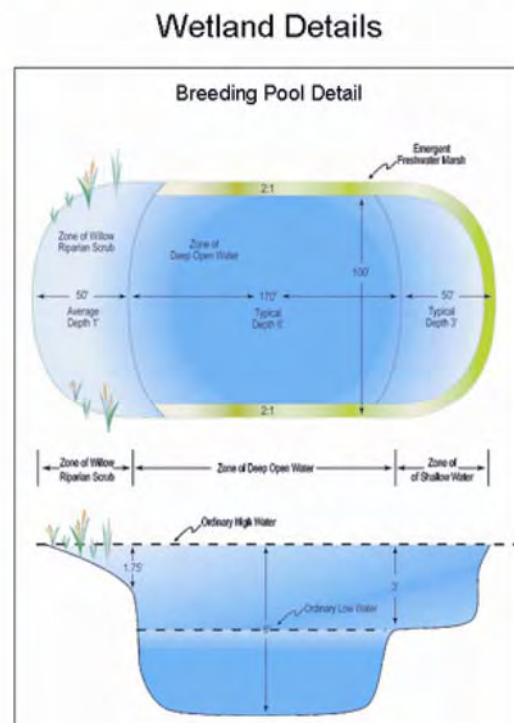
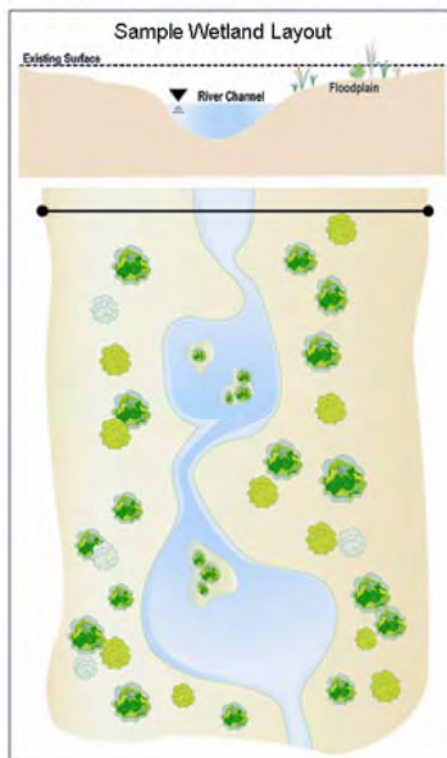
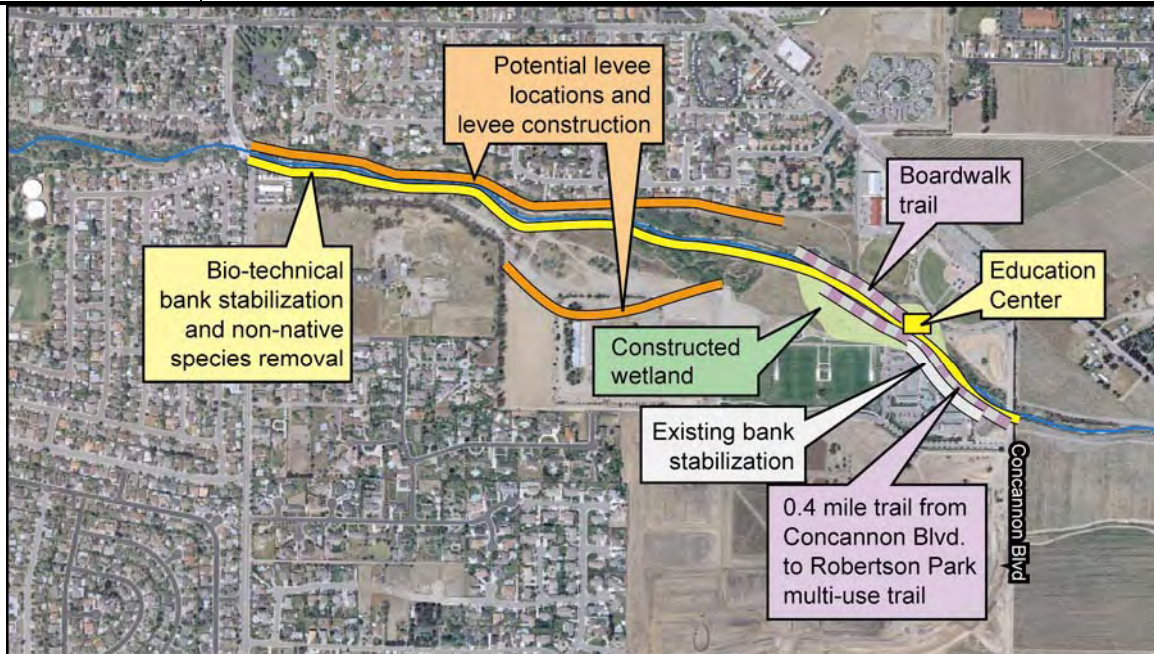


Project Number	R3-2
Project Name	Robertson Park Enhancement Project and Levee Construction
Project Location	Robertson Park at Arroyo Mocho from Concannon Blvd. to Arroyo Road (STA 540+00 to 480+00)
Purpose	Curtail erosion along Arroyo Mocho by implementing bank stabilization activities. Create wetlands to improve water quality and enhance critical habitat.
Project Components	- Construct wetland, including: - Creation of meandering channel. Meandering channel length is 750 feet or 1.5 times the wetland length (i.e. 500 feet, from STA 520+00 to 525+00). - Excavation of up to 8 acres of land to accommodate 100-year flood. - Downstream grade control to keep area wet. - Breeding/habitat pools. - Native trees, brush, and grasses as habitat, shade, and cover for species. - Construct biotechnical bank stabilization measures as needed along 6,000 feet of stream channel between Concannon Blvd and Arroyo Road (STA 540+00 to 480+00). - Manage vegetation by removing non-native species along 6,000 feet on both banks of stream, over 8.3 acres between Concannon Blvd and Arroyo Road (STA 540+00 to 480+00). - Recreational features include: - Education center/indoor classroom. The size is estimated to be 1,200 square feet. 500 feet of boardwalk trail above wetland. 0.40 mile trail to link the existing Concannon Blvd. trail to the existing Robertson Park multi-use trail along Arroyo Mocho. Trail will link east of Arroyo Mocho to existing pedestrian/bike bridge over Arroyo Mocho, east of the Concannon Blvd. Bridge. - Build levees, including: 3,500 feet of levee along the north bank (STA 515+00 to 480+00). 1,000 feet of levee along the south bank (STA 510+00 to 500+00). - Dedicate approximately 35 acres of land within levees as 100-year floodplain park/open space to prevent development within floodplain. Area is 100-year floodplain within the levees between Concannon Blvd and Arroyo Road (STA 540+00 to 480+00).
Capital Cost Estimate	\$28,040,000
Implementation Issues	- Diversion of flow or stop artificial flow during construction period - Wetland space requirements - Permitting in compliance with Clean Water Act Sections 401/404 - Coordination with RWQCB, CDFG, LARPD, local property owners
Project Precursors	- Hydrologic/hydraulic modeling - Identify ongoing funding sources for educational programs and public outreach
Project Benefits	Constructed wetland - Improves water quality. - Creates habitat opportunities for California red legged frog, California tiger salamander, and western pond turtle. - Provides flood detention. Bank stabilization - Creates habitat opportunities for California red legged frog, California tiger salamander, and western pond turtle. - Reduces local erosion and downstream deposition. - Slows bank migration.

	Education Center - Provides an education and public outreach opportunity. Trail - Provides regional trail connectivity. Levee Maintenance - Conduct annual inspection of site. - Conduct repairs of levee, as needed.
Goals/Objectives Addressed	Flood Protection and Drainage: A, B, C, D, E Erosion and Sedimentation: A Water Supply: none Water Quality: B, C, E, F Habitat & Environment: A, B, C, D, E, F Recreation, Trails, and Public Education: A, B, C, D, G
Maintenance Activities	Maintenance of wetlands: - Conduct annual visual estimates of vegetative cover and species composition to estimate vegetative cover, species diversity, presence or absence of target and invasive species, and general abundance of individual plant species. Identify species survival rate. - Replace wetland vegetation, as needed, to maintain at least 50% surface area coverage after second growing season. - Conduct hand weeding of exotic plant species during the first three years to ensure there is no interference with the development and establishment of target wetland plant species. - Conduct annual routine maintenance activities including access road maintenance, and debris removal. Maintenance of bank stabilization measures: - Conduct annual inspection of site. - Conduct repairs of bank stabilization measures, as needed. Maintenance of trails: - Conduct annual inspection of trails. - Seal cracks and repair pavement on trails, as needed. - Clear debris and vegetation growth, as needed. - Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$511,000
Notes	- Coordination with the City of Livermore and LARPD on project implementation and trails funding. - The education center/indoor classroom will be similar to size/function of that at Tyson Lagoon/Tule Pond in Fremont.
References	- Arroyo Mocho & Arroyo Las Positas Management Plans: Initial Findings and Recommendations, Philip Williams & Associates Ltd., December 8, 2000 - Joyce Blueford, Ph.D Geologist – Instructor for Tule Pond Workshops, 2003

R3-2

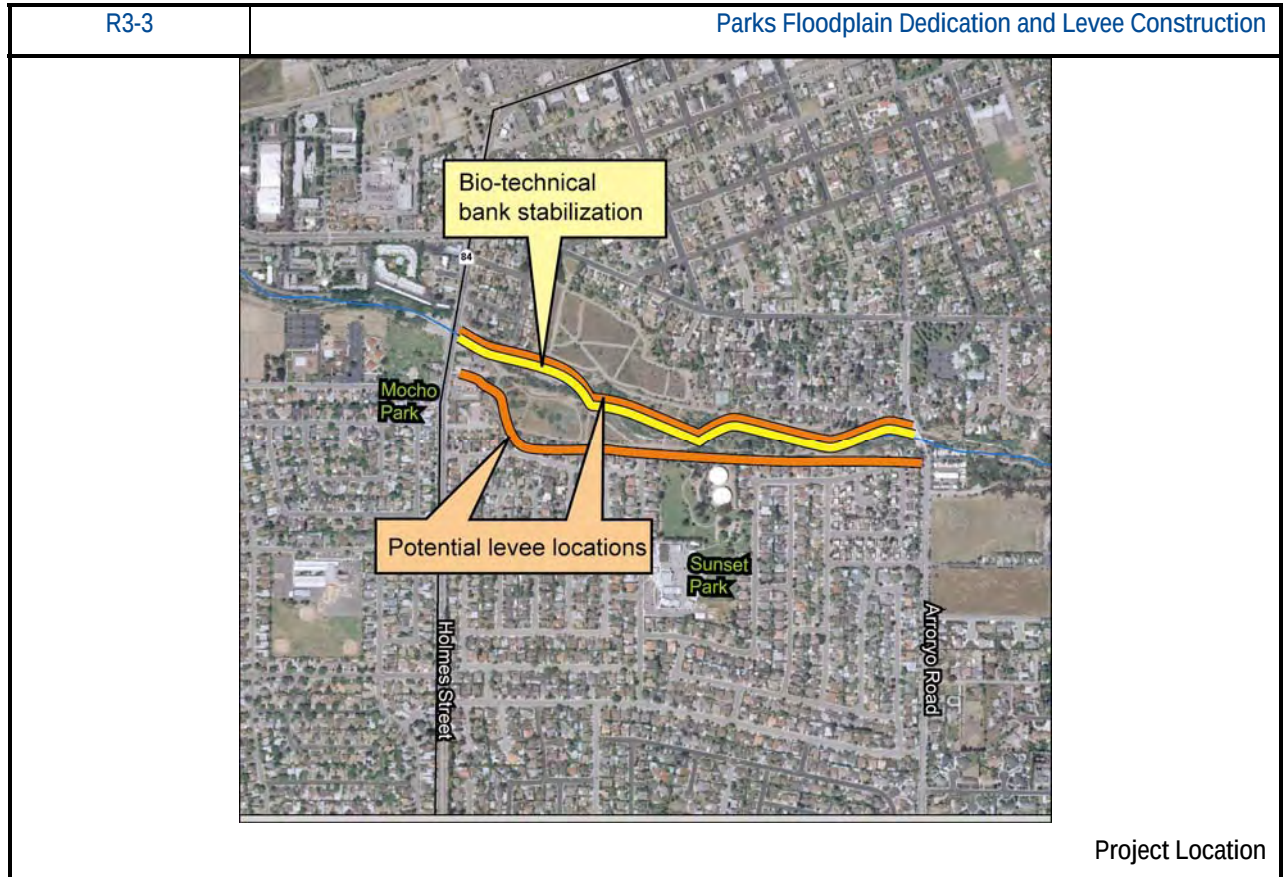
Robertson Park Enhancement Project and Levee Construction



Project Location and Schematic

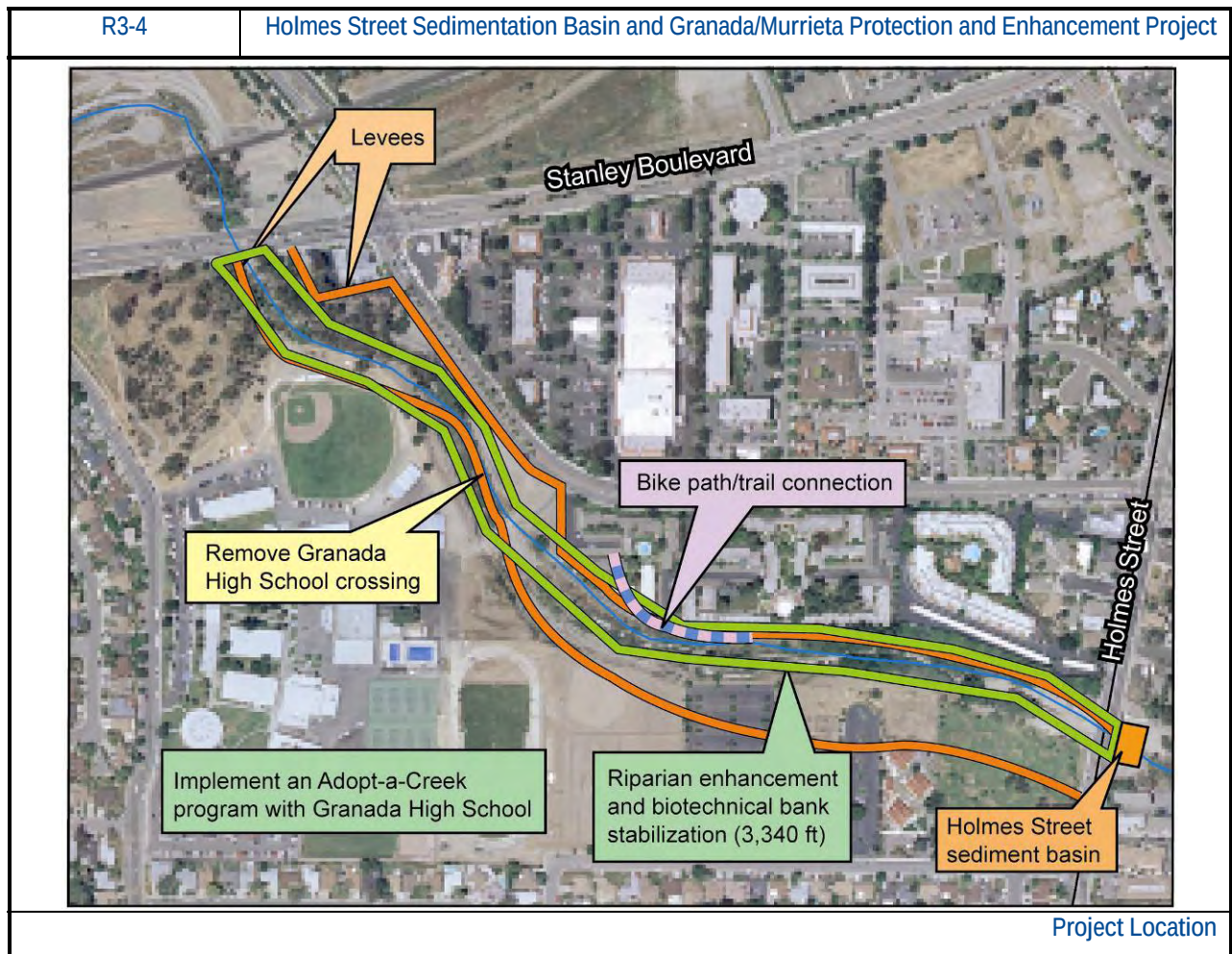
Project Number	R3-3
Project Name	Parks Floodplain Dedication and Levee Construction
Project Location	Arroyo Mocho from Arroyo Road to upstream of Holmes Street (i.e. between STA 480+00 and 443+40); Along Chain of Parks including Madeiros Parkway, and Mocho Park.
Purpose	Dedicate floodplain to attenuate 100-year flood flows at build-out conditions. Protect existing development from 100-year flood event.
Project Components	1. Dedicate approximately 36 acres of land within levees as 100-year floodplain park/open space to prevent development within floodplain. Floodplain extends from STA 480+00 to 443+00 between levees. 2. Levees construction includes: • 3,660 feet of levees (along south bank from STA 480+00 to 443+40; and along north bank from STA 480+00 to 443+40) to protect existing development. • Rerouting of 3,660 feet of maintenance road (especially emergency access routes) to be outside of flood area. • Revegetation of levees with native species along 3,660 feet of levees, on each bank, over 5 acres. 3. Construct bio-technical bank stabilization measures as needed from Arroyo Road to just upstream of Holmes Street along 3,660 feet of stream channel (STA 480+00 to 443+40).
Capital Cost Estimate	\$18,860,000
Implementation Issues	Coordination with the City of Livermore, LARPD, and property owners.
Project Precursors	• Coordinate with the City of Livermore to obtain and review the updated General Plan Land use. • Conduct hydraulic/hydrologic modeling under updated build-out conditions. • Robertson Park Enhancement Project and Levee Construction (R.3-2) • Holmes Street Sedimentation Basin and Granada/Murrieta Protection and Enhancement Project (R.3-4)
Project Benefits	• Attenuates flood flow • Provides healthy ecosystem by providing a continuous riparian corridor • Limits land use change, maintains open space • Since most of build-out flooding would occur within park boundaries the need for levees would be minimal if development within the parks was not allowed. • Earthen levees can be planted and become part of the park features and boundaries
Goals/Objectives Addressed	Flood Protection and Drainage: A, B, C, D, E Erosion and Sedimentation: A Water Supply: none Water Quality: none Habitat & Environment: B, C Recreation, Trails, and Public Education: none
Maintenance Activities	Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Levee Maintenance • Conduct annual inspection of site. • Conduct repairs of levee, as needed.
Annual Maintenance Cost Estimate	\$223,000
Notes	• Floodplain dedication can be done after modeling. Levee construction should be done after upstream and downstream projects. • Levee construction may not be necessary if build-out floodplain is within park boundaries • Levee construction will be necessary only to protect properties at build-out flood

	conditions • Levees may impact upstream and downstream flooding conditions
References	-



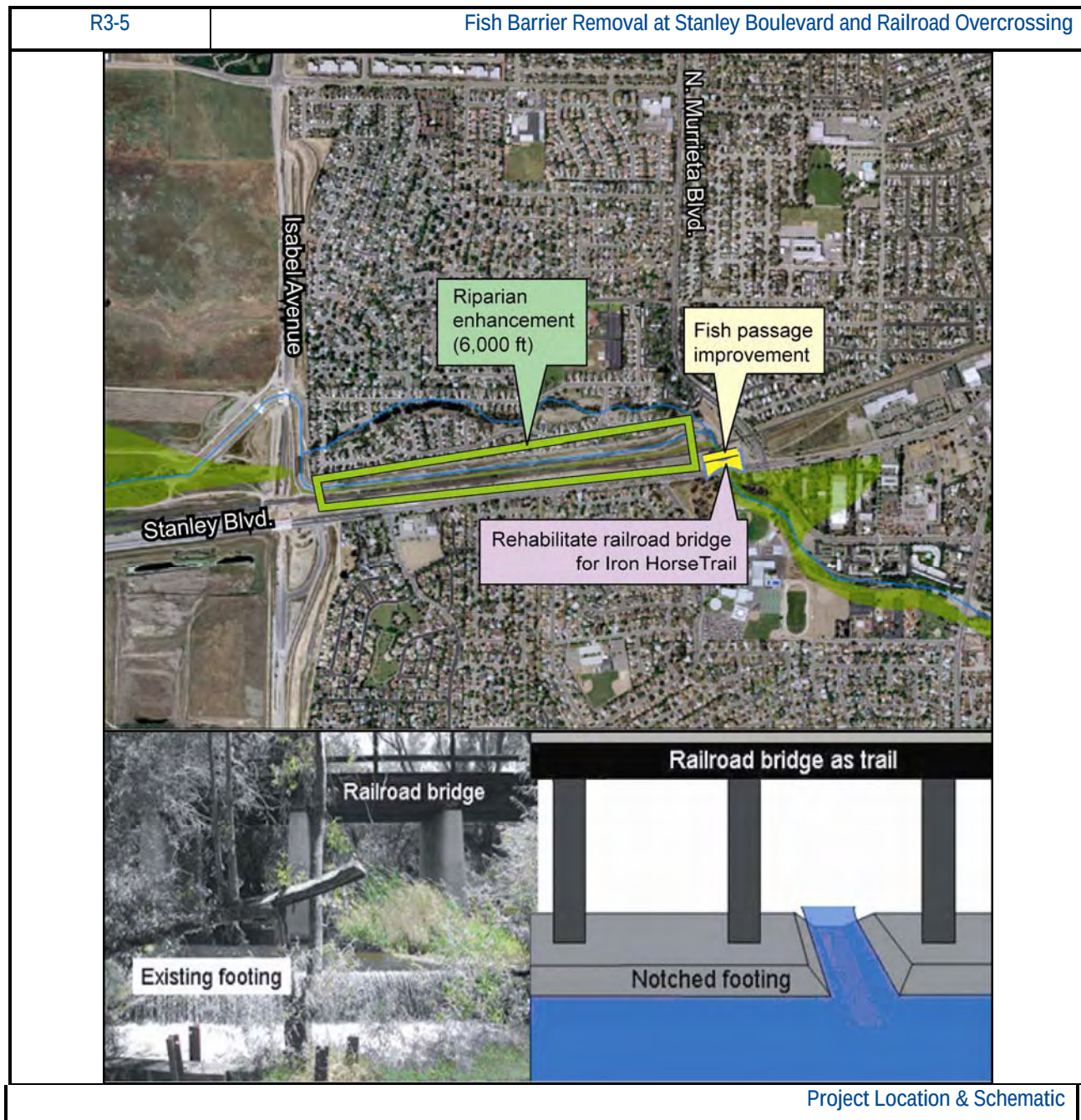
Project Number	R3-4
Project Name	Holmes Street Sedimentation Basin and Granada/Murrieta Protection and Enhancement Project
Project Location	Arroyo Mocho from immediately upstream of Holmes Street Bridge crossing to Stanley Blvd (STA 443+40 to STA 410+00)
Purpose	The purpose of this project is to curtail aggradation of Arroyo Mocho by trapping the sediment loads in a sediment basin, to protect existing development from 100-year flood event through levee construction, and provide connectivity between regional trails.
Project Components	1. Construct a sedimentation basin just upstream of Holmes Street between STA 443+40 and 440+00 on Arroyo Mocho. The estimated size is 1.9 AF. Project includes creation of 0.95 acres of wetlands as environmental mitigation for sediment basin construction. 2. Levees construction includes: • 3,340 feet of levees along the north and south banks of Arroyo Mocho from Holmes Street to Stanley Blvd (STA 443+40 to STA 410+00). • Routing of approximately 0.1 miles of trail along top of northern levee until existing trail separates from levee alignment (STA 430+00 to 425+00). 3. Dedicate approximately 25 acres of land within levees as 100-year floodplain park/open space to prevent development within floodplain. Area is floodplain between levees from Holmes Street to Stanley Blvd (STA 443+40 to 410+00). 4. Conduct approximately 3,340 feet of riparian enhancement along both banks of Arroyo Mocho from the Holmes Street sedimentation basin to Stanley Blvd, including along levees. Incorporate bio-technical bank stabilization measures (approximately 4.6 acres). 5. Remove existing Granada High School crossing which is a potential fish barrier. Replace existing crossing with a pedestrian bridge.
Capital Cost Estimate	\$13,590,000
Implementation Issues	• Cost/Benefit ratio needs to be analyzed • Permitting in compliance with Clean Water Act Section 401/404 • Coordination with RWQCB, CDFG, City of Livermore • Levee aesthetics • Safety issues associated with the levees • Coordination with RWQCB, City of Livermore, Livermore school system
Project Precursors	• Model sediment transport characteristics for Holmes Street bridge. • City of Livermore General Plan
Project Benefits	• Reduce maintenance costs for sediment removal • Reduce flooding potential at Holmes Street bridge crossing • Improved regional trail connectivity due to less deposition on bike path • Improved habitat conditions around Holmes Street bridge and along Mocho • Removes Murrieta Plaza businesses and potentially hospital and support buildings from floodplain • Removes fish migration blockage at current Granada High School crossing • Aesthetically enhances a well-traveled road and trail • Provides educational opportunities through Adopt-a-Creek and the Outdoor Classroom
Goals/Objectives Addressed	Flood Protection and Drainage: A, B, C, D, E Erosion and Sedimentation: A, C Water Supply: none Water Quality: C, E, F Habitat & Environment: A, B, C, E, F Recreation, Trails, and Public Education: A, B, C, D, E, G
Maintenance Activities	Maintenance of Sediment Basin: • Conduct field inspections of the sediment basin.

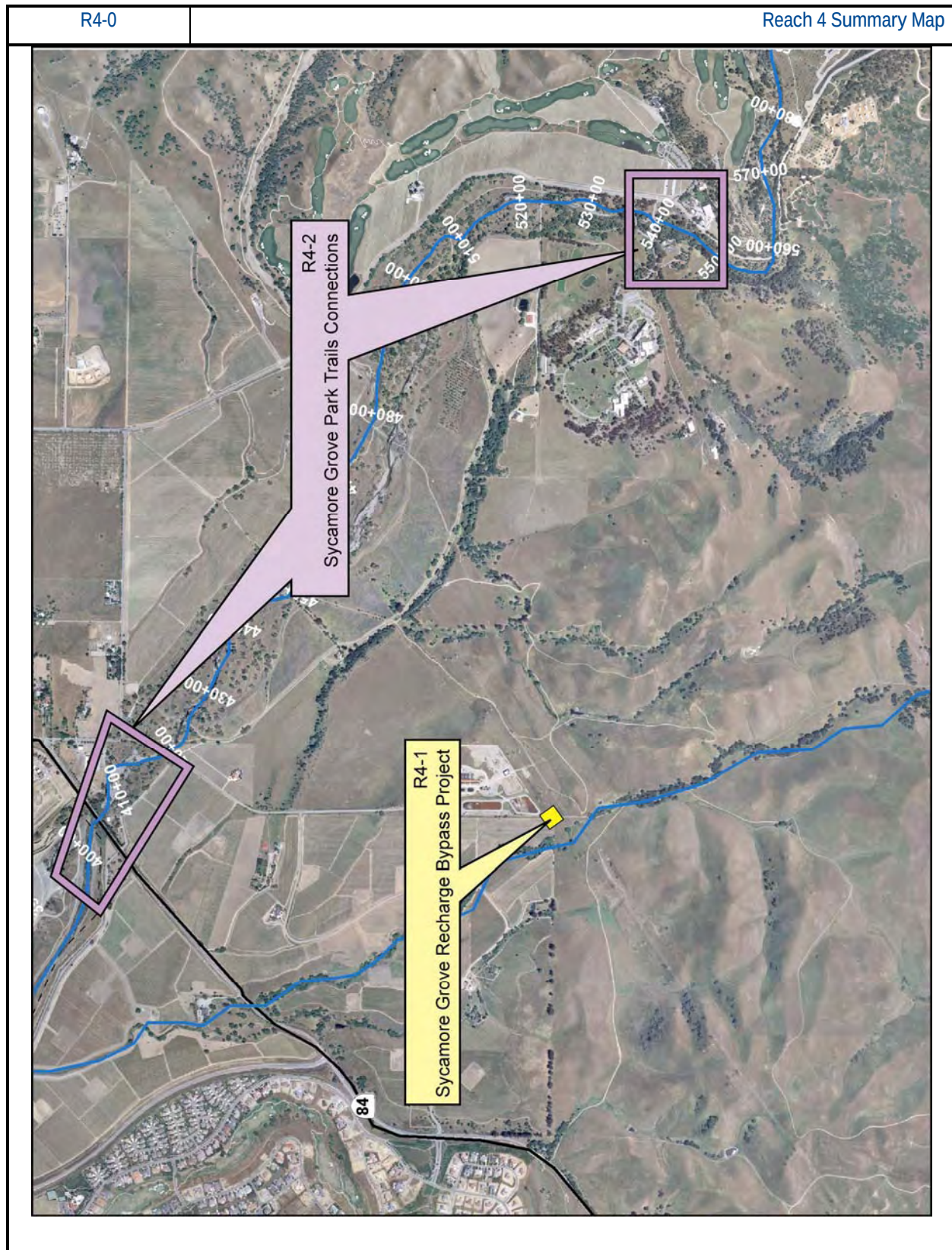
	• Conduct sediment sampling prior to sediment removal and prepare Sediment Characterization Report. • If desilting activities are conducted in a "wet stream", conduct water quality sampling prior to and after sediment removal. Prepare a Water Quality Sampling Plan. • Dewater site if desilting activities are conducted in a "wet stream". Conduct desilting activities. • Store and transport dredged material to an off-site landfill facility. • Conduct mitigation for sediment removal activities. Vegetation Maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on chemical clearing of invasive species which includes conducting a biological survey and implementing a water quality sampling plan. • Collect and dispose of vegetation debris. Levee Maintenance • Conduct annual inspection of site. • Conduct repairs of levee, as needed.
Annual Maintenance Cost Estimate	\$213,000
Notes	• Bed load source needs to be determined through sediment transport modeling. If it is further upstream then the upstream sedimentation basin could provide a short term solution. • Benefit/cost analysis needs to be complete for all options to determine whether additional cost yields additional benefit and over what time frame. • Sediment removal upstream of Holmes Street is currently conducted by the City of Livermore. According to Mr. Richard Frazer, from the City of Livermore, the City dredges the channel once every other year or every year depending on the frequency of rain storms. On average, they dredge approximately 800 to 1,000 CY although they have removed up to 1,500 CY of sediment from the stream. • LARPD would manage an Adopt-a-Creek program with Granada High School. • Friends of the Arroyos (FOTA) completed the 1-acre native vegetation park in Spring 2004. Related efforts should be coordinated. • The Granada High School crossing will be removed, but not replaced at the request of the School District which is gating off of the high school's back entrance, and "closing" the campus at lunch time. • The culvert crossing at Stanley Blvd is under capacity and can be improved as an alternative to constructing levees.
References	• Arroyo Mocho & Arroyo Las Positas Management Plans: Initial Findings and Recommendations, Philip Williams & Associates Ltd., December 8, 2000 • Personal communication with Mr. Richard Frazer, City of Livermore (June 10, 2004) • Personal communication with Louann Tung, FOTA, 2003 • Personal communication with Carol Mahoney, Zone 7 Water Agency, 2003 • Personal communication with Matt Katen, Zone 7 Water Agency, 2004 and 2005



Project Number	R3-5
Project Name	Fish Barrier Removal at Stanley Boulevard and Railroad Overcrossing
Project Location	Arroyo Mocho at the abandoned railroad Right-of-Way (ROW) crossing to Isabel Avenue (STA 409+00 to 350+00)
Purpose	Arroyo Mocho has been identified as a future corridor for steelhead migration. The purpose of this project is to restore Arroyo Mocho as a fish migration corridor by removing a fish barrier at the abandoned railroad ROW crossing near Stanley Blvd (STA 409+00), and improving riparian habitat along Arroyo Mocho from Stanley Blvd to Isabel Avenue.
Project Components	1. Modify railroad bridge footing for fish passage purposes. Modification will include removal of a portion of concrete slab and addition of appropriate energy dissipation features (STA 409+00). 2. Rehabilitate abandoned railroad bridge as part of Iron Horse Trail (STA 409+00). 3. Conduct approximately 6,000 feet of riparian enhancement along both banks of realigned Mocho (flood control channel) from Stanley Blvd to the Isabel Bridge crossing (approximately 8.3 acres).
Capital Cost Estimate	\$7,870,000
Implementation Issues	• Cost/Benefit ratio needs to be analyzed • Coordination with Southern Pacific Railroad, LARPD, Caltrans, CDFG, RWQCB • Permitting in compliance with Clean Water Act Section 401/404
Project Precursors	Analysis of structural needs of the railroad bridge and feasibility of removing a section of the footing.
Project Benefits	• Relieve major fish barrier along Arroyo Mocho • Alleviates local sediment accumulation • Increases regional connectivity by providing an off-road stream crossing • Improved habitat conditions along Mocho between Stanley Blvd and Isabel Ave
Goals/Objectives Addressed	Flood Protection and Drainage: none Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: A, B, C Recreation, Trails, and Public Education: D, G
Maintenance Activities	Maintenance of trails: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed. Vegetation maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on chemical clearing of invasive species which includes conducting a biological survey and implementing a water quality sampling plan. • Collect and dispose of vegetation debris.
Annual Maintenance Cost Estimate	\$80,000
Notes	Other alternatives exist which would remove the migration barrier. These include: • Install a Denil fishway or other suitable fish ladder through this reach of Arroyo Mocho. This would involve coordination with the City of Livermore and the ROW owner. This would not provide and trail or recreational use of the location. The cost is estimated to be \$740,000. • Completely remove the abandoned railroad bridge and footing. This would involve coordination with the City of Livermore and the ROW owner. This option

	would preclude trail and recreational use of the bridge. The cost is estimated to be \$1,140,000.
References	An Assessment of the Potential for Restoring a Viable Steelhead Trout Population in the Alameda Creek Watershed, Gunther et al., February 7, 2000

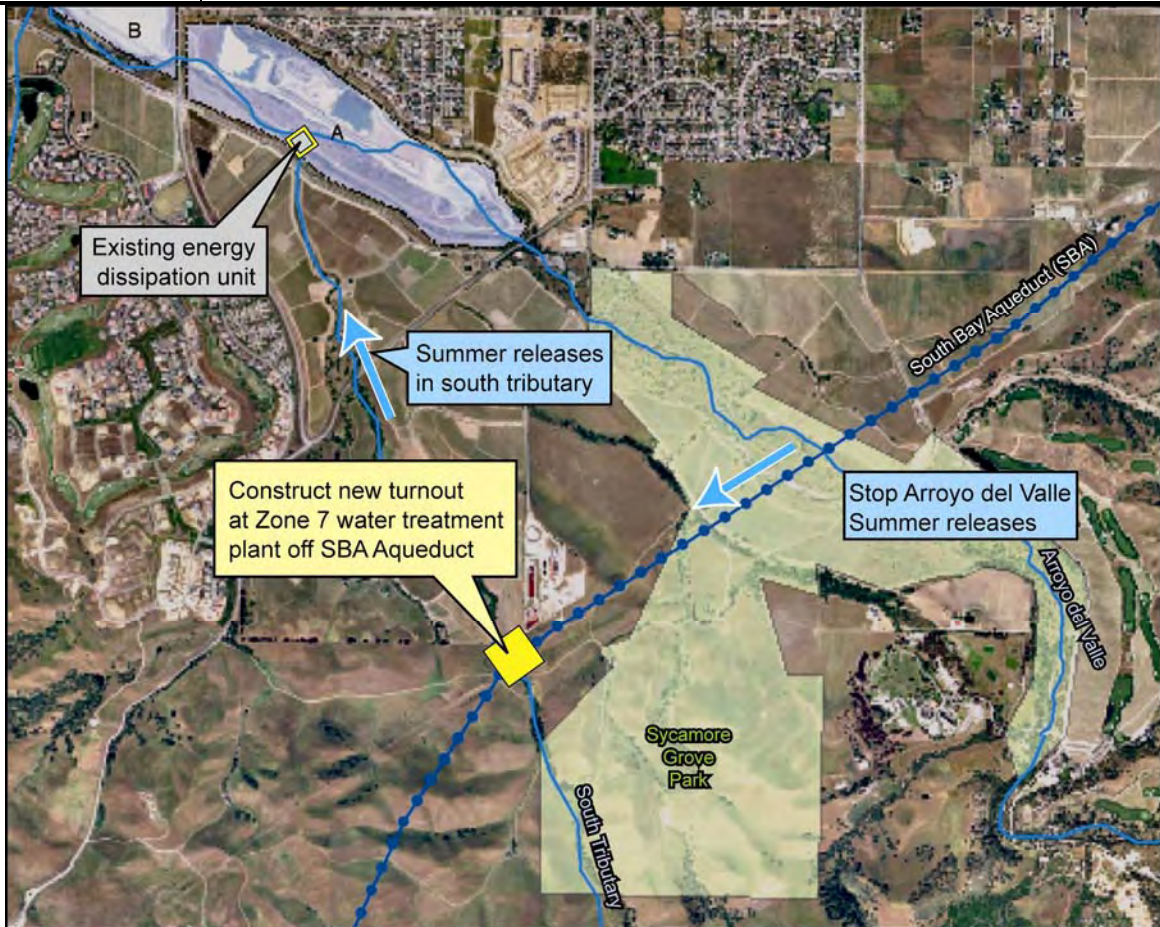




Project Number	R4-1
Project Name	Sycamore Grove Recharge Bypass Project
Project Location	Sycamore Grove Park, from the Zone 7 Water Treatment Plant to Lake A.
Purpose	Replace existing summer-time water releases from Del Valle Reservoir into Arroyo del Valle with releases from South Bay Aqueduct (SBA) into South Tributary.
Project Components	1. Modify valving of existing blow-up at Zone 7 Water Treatment plant and transform into new SBA turnout.
Capital Cost Estimate	\$1,200,000
Implementation Issues	• Permitting and coordination with California Department of Fish and Game (CDFG). • Coordination with LARPD. • Potential conflict with beneficial uses associated with current releases from Del Valle Reservoir. • Potential impacts to habitat along South Tributary.
Project Precursors	• Completion of Sycamore Grove Recovery Program studies jointly funded by Zone 7 and LARPD.
Project Benefits	• Provide flexibility in operation of del Valle releases. • Provide flexibility in management of Sycamore Grove Park hydrology. • Provide groundwater recharge.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: none Water Supply: A Water Quality: none Habitat & Environment: A, B, F Recreation, Trails, and Public Education: none
Maintenance Activities	Turnout Maintenance: • Annual inspection of turnout structure and associated appurtenances.
Annual Maintenance Cost Estimate	\$33,000
Notes	The Sycamore Grove Recovery Program Phase 1 Technical Report initiated by Zone 7 and LARPD was completed in December 2004. The study identified that the main causes of the sycamore decline during the 1980s and 1990s may have been due to coinciding hydrologic and climatic factors. During the period 1985-1993, tree growth was the poorest on record, a pattern that suggests the possibility that the range of natural variability in tree growth has expanded under the modified Arroyo del Valle flow regime. The report also found that sycamore growth has increased to average or above average since 1993, suggesting that environmental conditions since 1993 are generally conducive to mature tree growth.
References	• Sycamore Grove Recovery Program Phase I Technical Report, Preliminary Findings, Sycamore Associates LCC et al., December 22, 2004 • Sycamore Grove Park Draft Resources Maintenance Plan, Vol. 1 and 2, Sycamore Associates LLC, May 2002

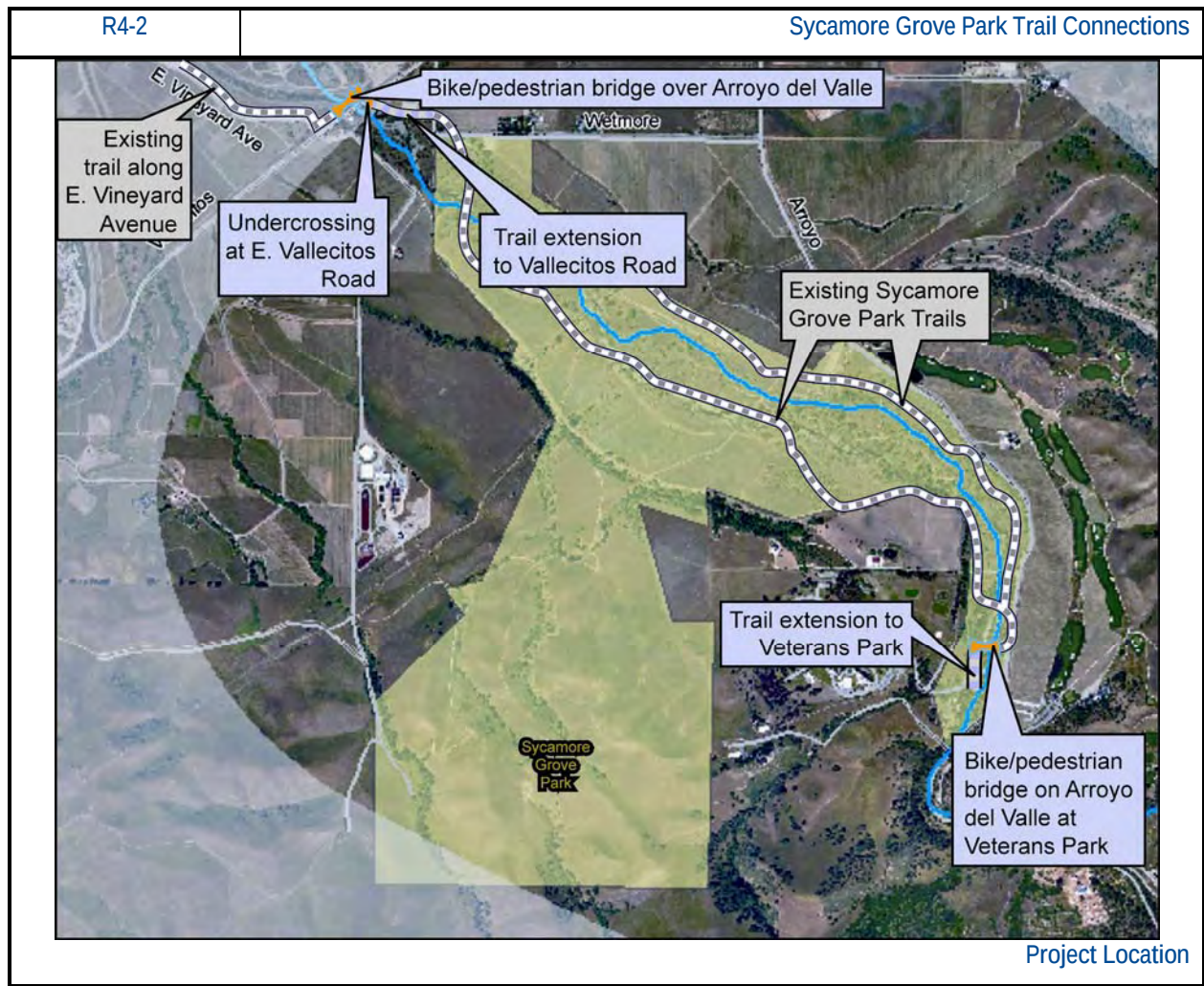
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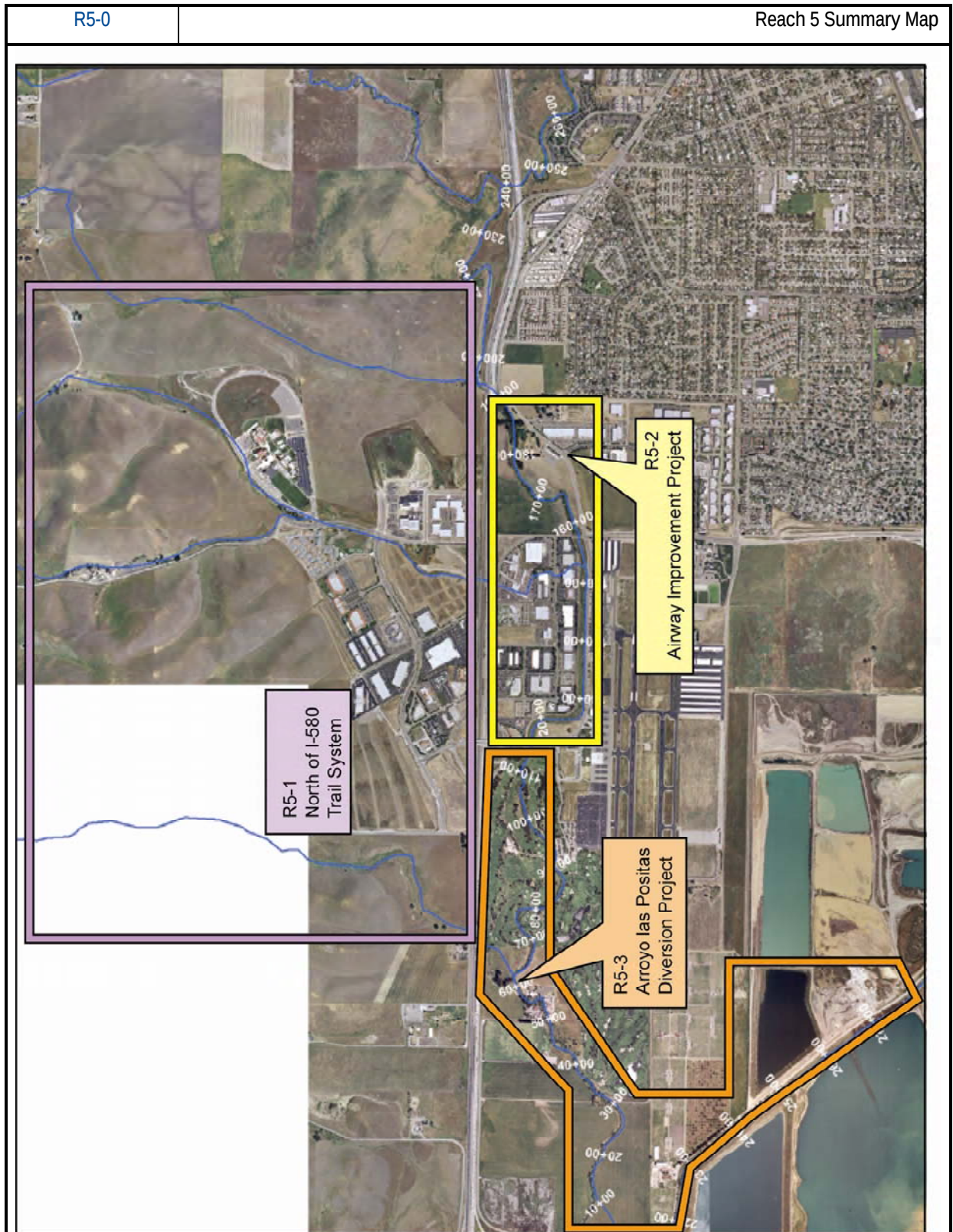
Sycamore Grove Recharge Bypass Project



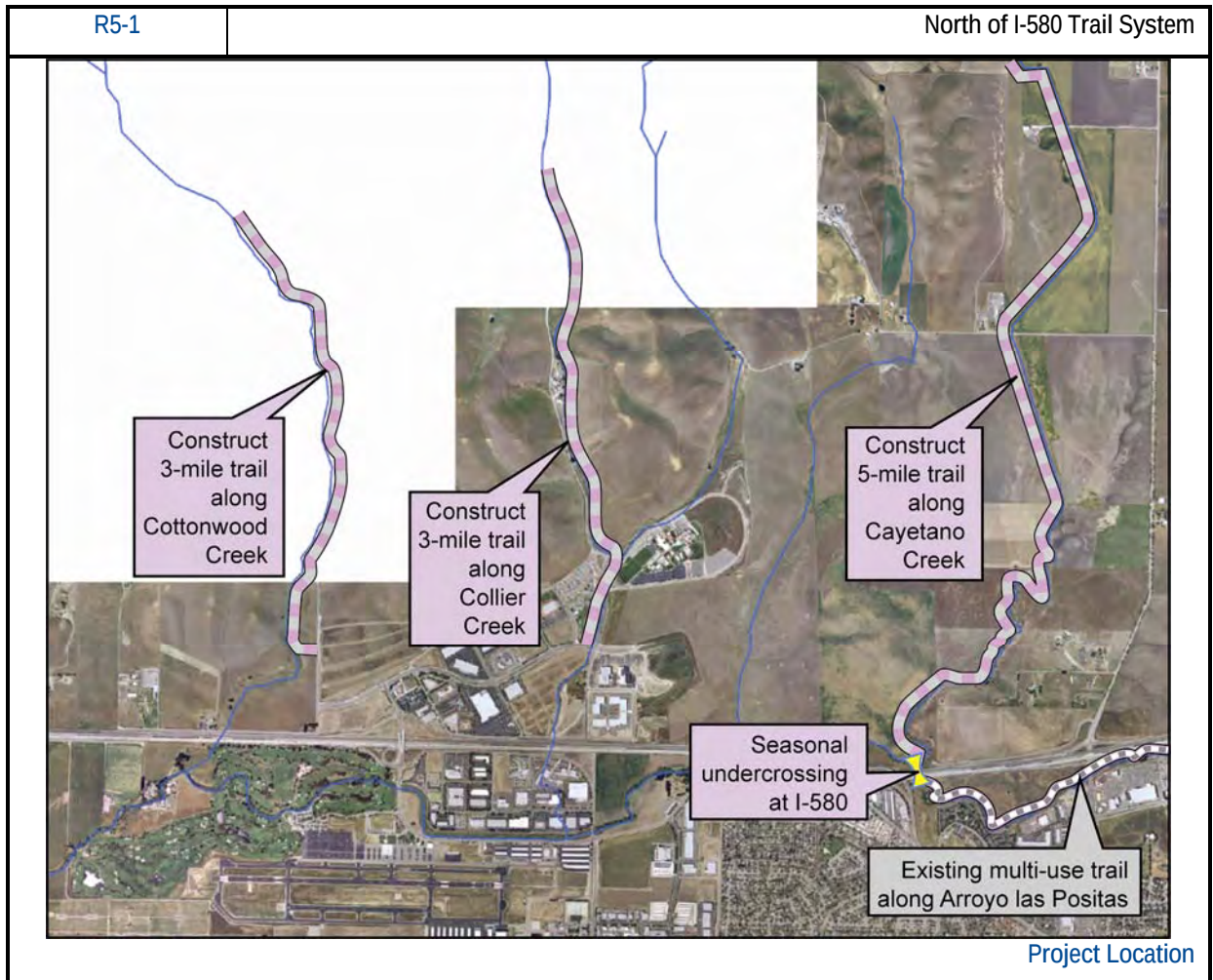
Project Location

Project Number	R4-2
Project Name	Sycamore Grove Park Trail Connections
Project Location	Sycamore Grove Park from Vallecitos Road to Veterans Park
Purpose	Create a system of regional trails by filling in regional trail corridor gaps.
Project Components	1. Link the existing Sycamore Grove Park trail to EBRPD's trail along East Vineyard Avenue by: • Constructing a 0.25 mile trail extension of Westmore Road trail to Vallecitos Road. • Constructing a pedestrian bridge (alternatively an undercrossing) at Vallecitos Bridge to cross E. Vallecitos Road. • Adding signage at the E. Vallecitos Road crossing. • Constructing a bike/pedestrian bridge over Arroyo del Valle • Constructing 0.2 mile of trail from bridge to proposed trail along E.Vineyards Avenue from Isabel Parkway to Vallecitos Road. 2. Link the existing Sycamore Grove park trail to Veterans Park by: • Construct a bike/pedestrian bridge at Veterans Park. • Construct a trail extension of 0.2 mile from the existing Sycamore Grove Park trail (STA 525+00) to the Veterans Park (STA 535+56). • Adding signage at the Veterans Park road crossing. 3. Acquire approximately 1.5 acres of land for trail construction (3,230 feet x 20 feet).
Capital Cost Estimate	\$2,260,000
Implementation Issues	Coordination with Caltrans, EBRPD, and LARPD.
Project Precursors	-
Project Benefits	Provide connectivity to regional trail system.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: none Recreation, Trails, and Public Education: B, C, D
Maintenance Activities	Trail Maintenance: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$29,000
Notes	-
References	• City of Livermore Bikeways and trails Master Plan, Wilbur Smith Associates, December 11, 2001 • Sycamore Grove Park Draft Resources Maintenance Plan, Vol. 1 and 2, Sycamore Associates LLC, May 2002 • Personal communication with City of Livermore, Summer 2003



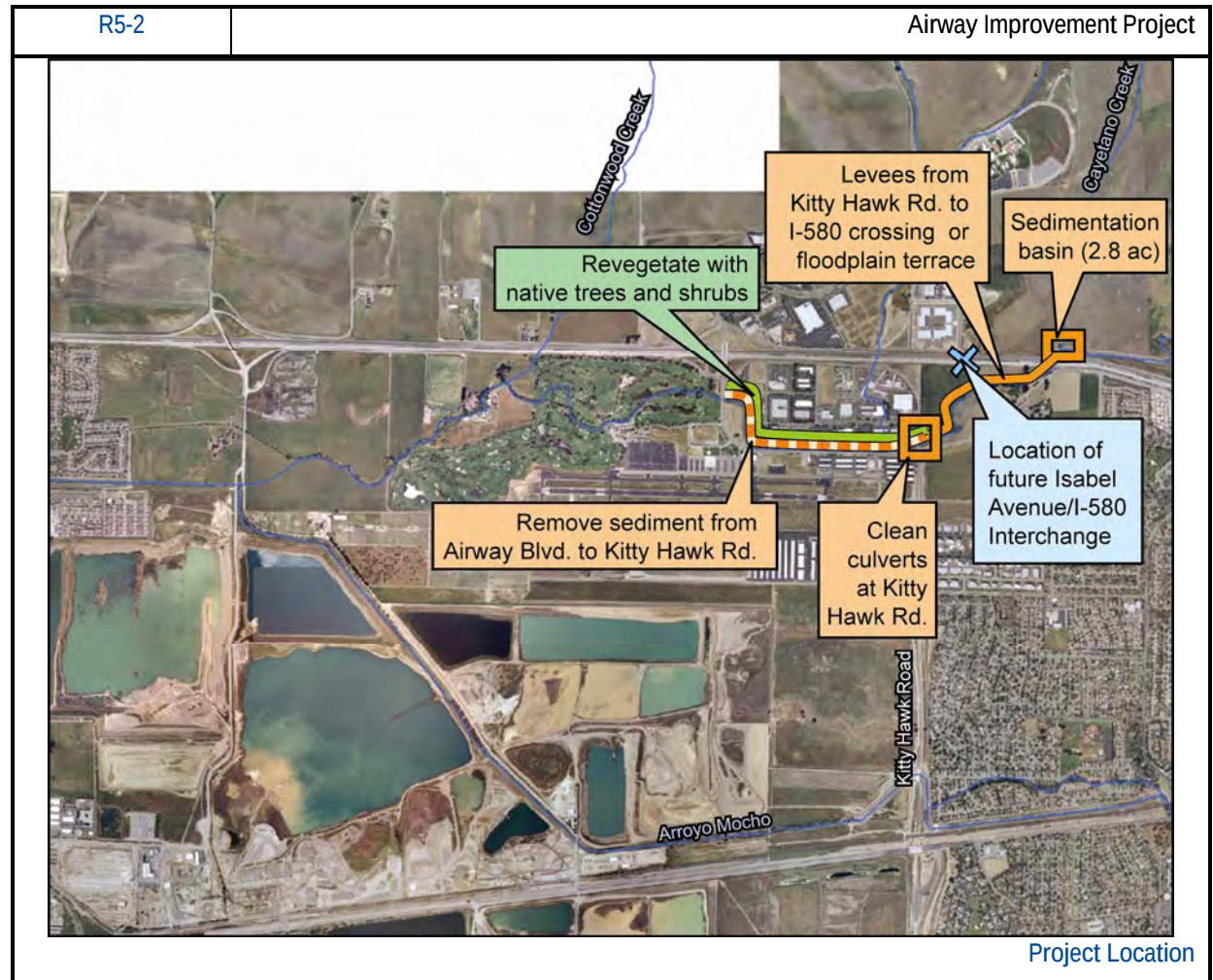


Project Number	R5-1
Project Name	North of I-580 Trail System
Project Location	Cottonwood Creek, Collier Creek, and Cayetano Creek.
Purpose	Promote recreational corridors along Arroyo las Positas tributaries north of I-580 and create a system of regional trails.
Project Components	1. Cottonwood Trail: • Construct a 3 mile trail along Cottonwood Creek starting at its intersection with N. Canyons Parkway. 2. Collier Trail: • Construct a 4.5 mile trail along Collier Creek starting at its confluence with Arroyo las Positas. 3. Cayetano Trail: • Construct a 5 mile trail along Cayetano Creek starting at the confluence with Arroyo las Positas. • Construct seasonal undercrossing at I-580 to connect to existing trail along Arroyo las Positas, west of N.Livermore Avenue. The undercrossing could also provide connectivity to potential future BART Station. 4. Install 1,500 feet of fencing to exclude cattle from the creeks (assume 500 feet needed for each creek). 5. Acquire 30.3 acres of land for trails.
Capital Cost Estimate	\$22,390,000
Implementation Issues	Coordination with LARPD and City of Livermore. Coordination with BART.
Project Precursors	-
Project Benefits	Expands trail system north of I-580.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: none Water Supply: none Water Quality: E Habitat & Environment: C Recreation, Trails, and Public Education: C, D, G
Maintenance Activities	Maintenance of trails: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed. Fencing maintenance: • Inspect and repair fencing as needed, on an annual basis.
Annual Maintenance Cost Estimate	\$569,000
Notes	Determine exact location of fencing needs in design phase.
References	City of Livermore Bikeways and Trails Master Plan, Wilbur Smith Associates, December 11, 2001



Project Number	R5-2
Project Name	Airway Improvement Project
Project Location	Arroyo las Positas from the Airway Boulevard crossing, eastward to just upstream of the I-580 crossing (STA 220+00 to 145+00).
Purpose	The capacity deficiency of Arroyo las Positas is exacerbated by the aggradation of the channel due to excessive sediment deposition upstream of the Las Positas Golf Course. The project purpose is to restore the reach capacity and curtail future aggradation by trapping sediment loads in a sediment basin located upstream of I-580.
Project Components	1. Remove sediment accumulated at culverts in Kitty Hawk Road. 2. Remove sediment along Airway Blvd (STA 185+00 to 145+00). 3. Construct a 2.8 acre sediment basin north of I-580 and downstream of confluence of Arroyo las Positas with Cayetano Creek. 4. Carry out mitigation for sediment removal. Assuming approximately 10.6 acres of land is needed for mitigation purposes. 5. Construct levees starting upstream of the Kitty Hawk Road crossing and ending at the I-580 crossing (STA 220+00 to 195+00). As an alternative, construct floodplain terrace incorporating bank stabilization measures and native species plantings around proposed BART station. For cost estimating purposes, levees were assumed. 6. Plant shaded riverine aquatic cover along 4,000 feet of channel banks (STA 185+00 to 145+00).
Capital Cost Estimate	\$24,960,000
Implementation Issues	• Ensuring that local drainage is not impacted by levees upstream of Kitty Hawk Road. • Permitting in compliance with CWA Section 401/404. • Coordination of improvements with Caltrans Isabel Road Interchange Project and potential future BART extension including identified mitigation measures. • Coordination of construction of sediment basin north of I-580 with Caltrans storm water compliance program. • Coordination of use of access road for seasonal trail under I-580 with Caltrans, City of Livermore and LARPD. • Coordinate with private landowners on right of way (ROW) issues. • If sediment basin upstream of I-580 is deemed unfeasible due to right-of-way restrictions, consider implementation of sediment basin downstream of the I-580 crossing at Station 185+00. Phasing of project implementation must consider downstream improvements.
Project Precursors	• Conduct sediment balance analysis for Arroyo las Positas. • Conduct hydrologic/hydraulic analysis to define channel capacity with proposed improvements.
Project Benefits	• Restores conveyance capacity of Arroyo las Positas upstream of Airway Boulevard. • Reduces sediment accumulation into Arroyo las Positas upstream of Airway Boulevard. • Provides trail connectivity between areas south and north of 580.
Goals/Objectives Addressed	Flood Protection & Drainage: A, B, C Erosion and Sedimentation: A, B, C Water Supply: none Water Quality: C Habitat & Environment: E Recreation, Trails, and Public Education: none
Maintenance Activities	Maintenance of sediment basin: • Conduct field inspections of the sediment basin. • Conduct sediment sampling prior to sediment removal and prepare Sediment Characterization Report. • If desilting activities are conducted in a "wet stream", conduct water quality

	sampling prior to and after sediment removal. Prepare a Water Quality Sampling Plan. • Dewater site if desilting activities are conducted in a "wet stream". Conduct desilting activities. • Store and transport dredged material to an off-site landfill facility. • Conduct mitigation for sediment removal activities. Levee Maintenance: • Conduct annual inspection of site. • Conduct repairs of levee, as needed. Vegetation maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on chemical clearing of invasive species which includes conducting a biological survey and implementing a water quality sampling plan. • Collect and dispose of vegetation debris.
Annual Maintenance Cost Estimate	\$279,000
Notes	Channel improvements proposed upstream of Kitty Hawk Road should be re-assessed once the BART and Caltrans improvements are defined.
References	• Existing Conditions and Sensitivities/Constraints Analysis for Arroyo Las Positas Stream Corridor Management Plan Phase I, Questa Engineering Corporation, April 1998 • Arroyo Mocho & Arroyo Las Positas Management Plans: Initial Findings and Recommendations, Philip Williams & Associates Ltd., December 8, 2000 • Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001



Project Number	R5-3
Project Name	Arroyo las Positas Diversion Project
Project Location	The Arroyo las Positas diversion is proposed at Station 60+00, downstream of Las Positas Golf Course. The diversion channel extends to Lake G and Cope Lake. Widening of Arroyo las Positas occurs from the Airway Boulevard crossing through Las Positas Golf Course to the Mocho confluence.
Purpose	Alleviate capacity deficiency at Arroyo Las Positas through Las Positas Golf Course and downstream of the diversion structure to protect adjacent property from potential flooding. The existing capacity at Las Positas Golf Course is approximately 1,800 cfs, and will be improved to accommodate the estimated design flow under projected build-out conditions of approximately 10,100 cfs. The reach downstream of the Golf Course will also be widened by terracing, to convey approximately 3,700 cfs. Provide detention storage at Chain of Lakes as part of a regional flood protection solution for the Livermore-Amador Valley.
Project Components	A. <u>Arroyo las Positas Diversion Channel</u> Construct a diversion channel to divert Arroyo las Positas flood flows to Lake G and Cope Lake of the Chain of Lakes. The diversion channel will convey approximately 6,400 to 9,400 cfs of flood flows from Arroyo las Positas, and 3,400 cfs from Arroyo Mocho totaling 9,800 to 12,800 cfs; and will include: 1. Flow control structure with automated gates and an overflow structure • Generator and housing as standby power for gates 2. Diversion/Drainback Channel • Approximately 3,000 feet of earthen-lined, excavated-cut channel 3. Distribution Channel • Approximately 1,750 feet of concrete channel • Gated outlets to Lake G (side weir) and Cope Lake (box culvert) 4. Box culvert under Arroyo Mocho between Lake G and Cope Lake 5. Drainback outlet to widened Mocho • Flow control structure with gates 6. Land acquisition (approximately 40 acres) B. <u>Widening of Arroyo las Positas through the Golf Course:</u> Widen Arroyo las Positas to convey approximately 10,100 cfs through the golf course to the diversion location. The widening of the Arroyo las Positas will include: 1. Lowering channel invert by 5 feet for a length of 10,000 feet through the Las Positas Golf Course; 2. Widening of channel and re-design of Las Positas Golf Course in vicinity of channel 3. Conduct sediment removal at Airway Boulevard Bridge to increase hydraulic capacity. 4. Construct a sediment basin (2.8 acres) downstream of the confluence of Arroyo las Positas and Cottonwood Creek. 5. Carry out mitigation for sediment removal. Assuming approximately 1.4 acres of land is needed for mitigation purposes. C. <u>Widening of Arroyo las Positas Downstream of the Diversion:</u> Widen Arroyo las Positas utilizing terracing to convey approximately 3,700 cfs from the proposed diversion structure (Station 60+00) to the improved section of Arroyo las Positas just above the confluence with Arroyo Mocho (beginning at Station 45+00). Also includes improvements to the capacity at the fish ladder. Terraced section will be replanted. 1. Assumes terraces will be constructed at a width of 25 feet on each bank to a depth of 10 feet, for a channel length of 1,500 feet. 2. Revegetation will be completed for 25 feet on each bank for a channel length of 1,500 feet. D. Creation of approximately 9 acres of wetland as a mitigation measure for this project (R.5-3).
Capital Cost Estimate	\$148,870,000

Implementation Issues	• Coordination with City of Livermore, Livermore Airport, and Las Positas Golf Course. • Permitting in compliance with CWA Section 401/404. • Operations and Control Plan Studies • Coordinate with gravel mining companies • Coordination with Crosswinds Church.
Project Precursors	• Conduct facilities and operations planning for detention storage in the Chain of Lakes. • Prepare plans for Las Positas Golf Course modifications to accommodate widening of Arroyo las Positas. • Conduct sediment balance analysis for Arroyo las Positas.
Project Benefits	• Addresses Arroyo las Positas capacity deficiency • Addresses flooding of Las Positas Golf Course • Conveys flood flows to Chain of Lakes for storage • Minimizes flooding in downstream reach of Arroyo de la Laguna through the use of regional storage of flood flows. • Provides regional storage for the Livermore-Amador Valley • Restores conveyance capacity of Arroyo las Positas upstream of Airway Boulevard. • Reduces sediment accumulation into Arroyo las Positas upstream of Airway Boulevard.
Goals/Objectives Addressed	Flood Protection & Drainage: A, B, C, E Erosion and Sedimentation: A, B, C Water Supply: A, C, D, E, F Water Quality: C Habitat & Environment: none Recreation, Trails, and Public Education: none
Maintenance Activities	For components A through C, a maintenance procedure will be developed in the design phase. Maintenance of sediment basin: • Conduct field inspections of the sediment basin. • Conduct sediment sampling prior to sediment removal and prepare Sediment Characterization Report. • If desilting activities are conducted in a "wet stream", conduct water quality sampling prior to and after sediment removal. Prepare a Water Quality Sampling Plan. • Dewater site if desilting activities are conducted in a "wet stream". Conduct desilting activities. • Store and transport dredged material to an off-site landfill facility. • Conduct mitigation for sediment removal activities. Maintenance of wetlands: • Conduct annual visual estimates of vegetative cover and species composition to estimate vegetative cover, species diversity, presence or absence of target and invasive species, and general abundance of individual plant species. Identify species survival rate. • Replace wetland vegetation, as needed, to maintain at least 50% surface area coverage after second growing season. • Conduct hand weeding of exotic plant species during the first three years to ensure there is no interference with the development and establishment of target wetland plant species. • Conduct annual routine maintenance activities including access road maintenance, and debris removal.
Annual Maintenance Cost Estimate	\$2,216,000

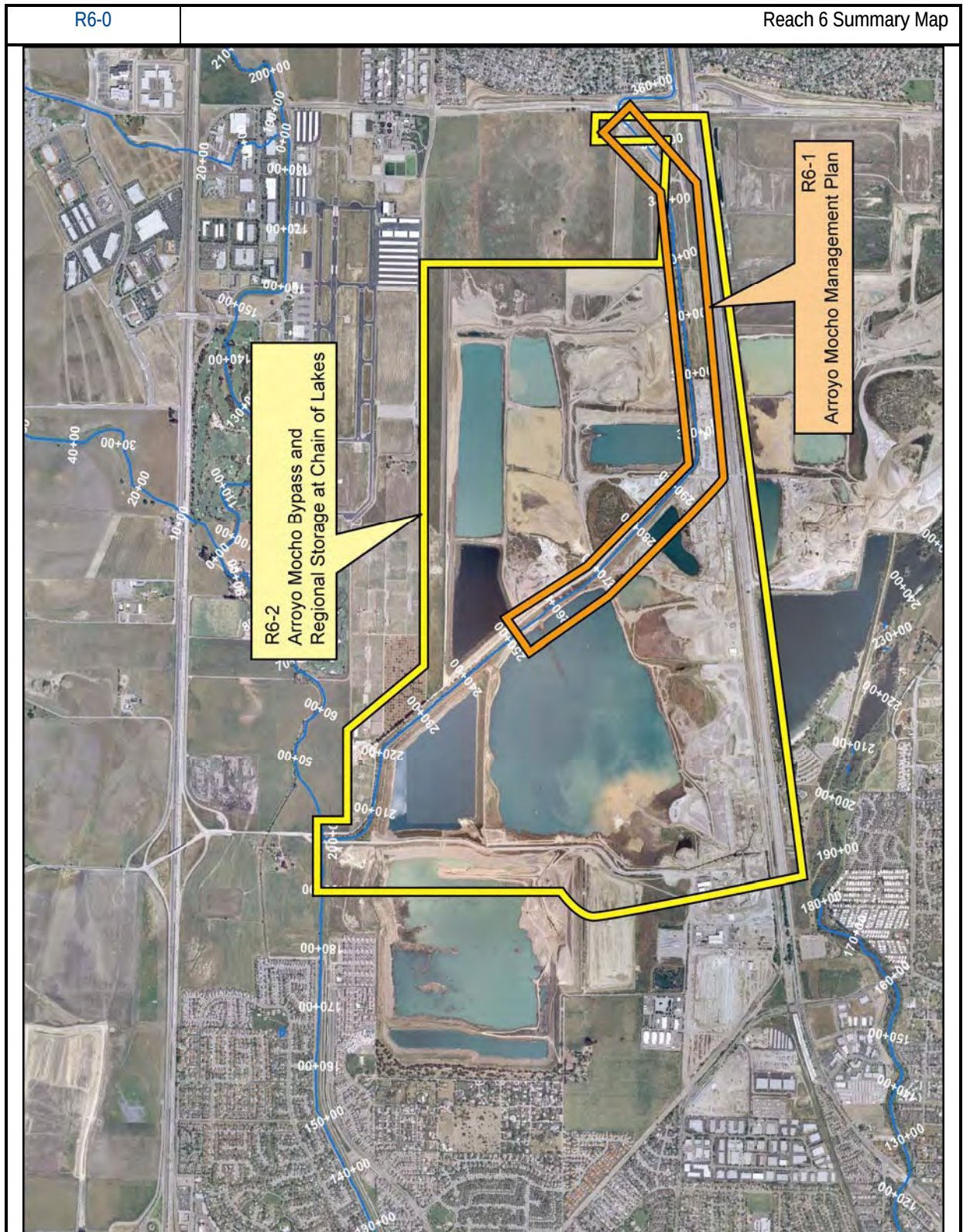
Notes	-
References	Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001

R5-3

Arroyo las Positas Diversion Project

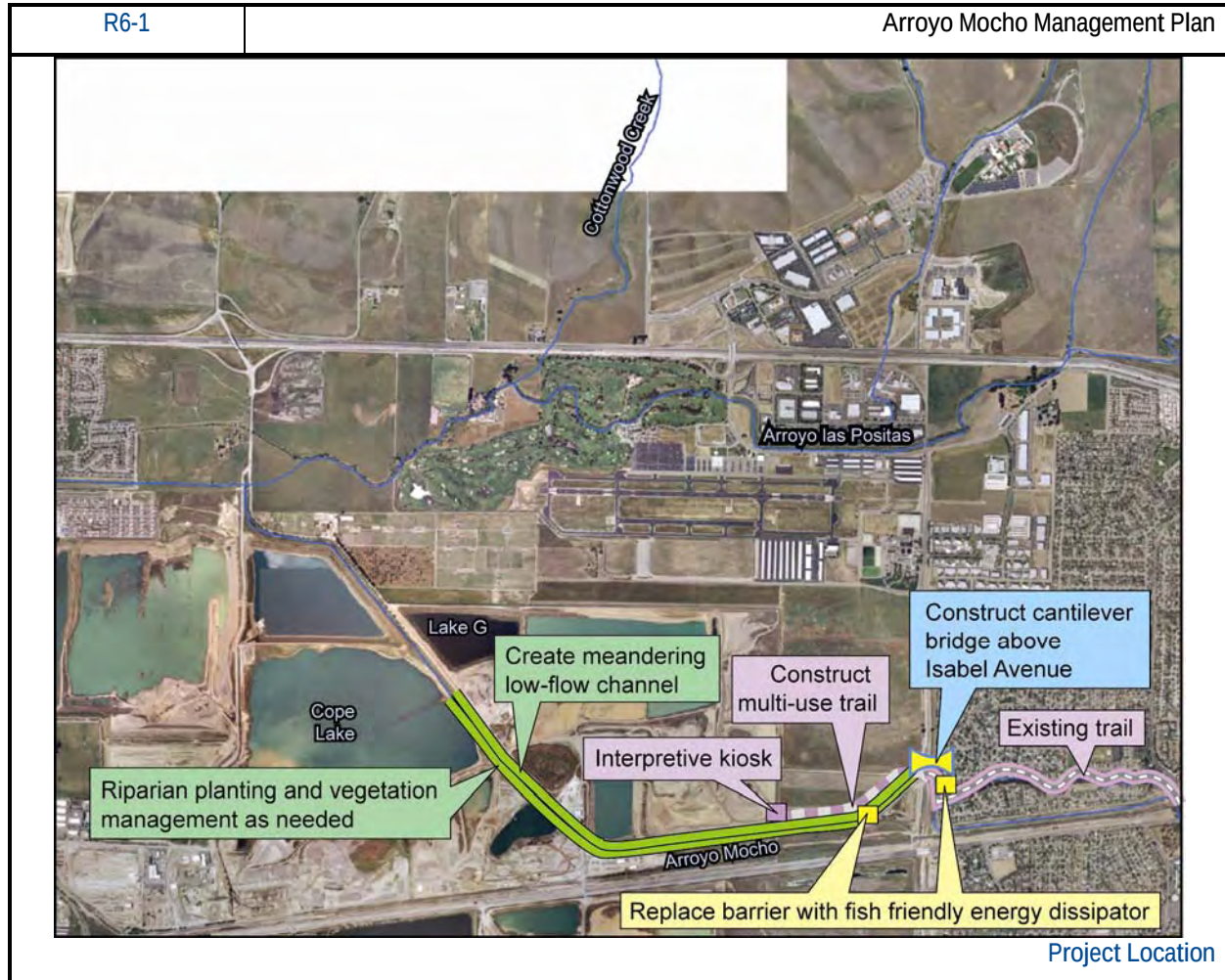


Project Location



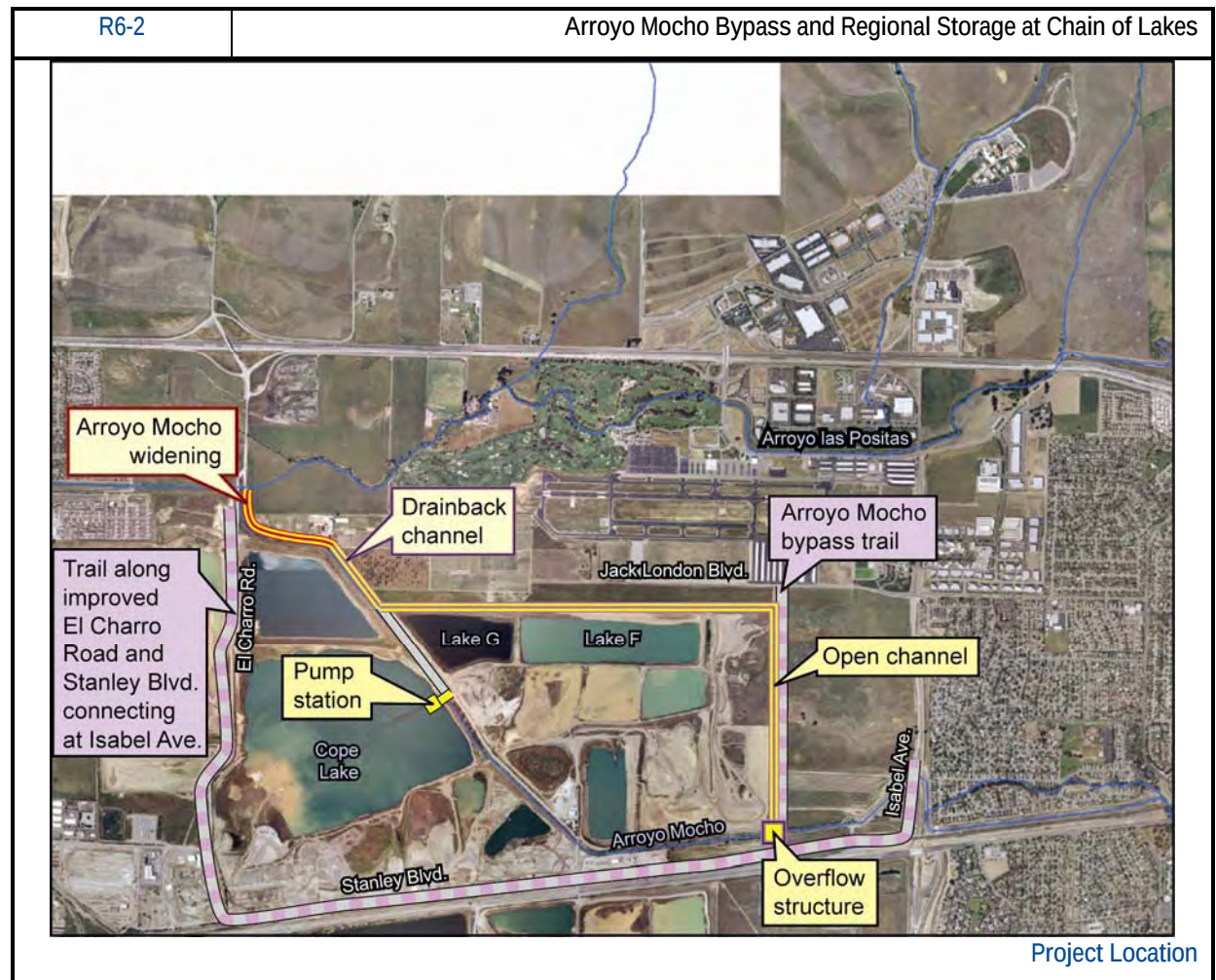
Project Number	R6-1
Project Name	Arroyo Mocho Management Plan
Project Location	Arroyo Mocho along the Chain of Lakes, STA 350+00 to 200+00.
Purpose	The proposed project is expected to protect and enhance the stream habitat and improve the riparian value of the stream. Another purpose is to create a recreational corridor along Arroyo Mocho and link this recreational corridor to the regional trail system.
Project Components	- Conduct habitat enhancement, including: - Vegetation management west of Lake E along 7,500 feet of bank for 20 feet on each side to improve conveyance (STA 350+00 to 275+00). - Meandering low-flow channel along 7,500 feet of Arroyo Mocho (STA 350+00 to 275+00) assuming a 1.25 meandering ratio. Project includes acquisition of 10.3 acres required for habitat improvements. - Modify 2 existing fish barriers (dragon's teeth-energy dissipation units) upstream and downstream of Isabel Avenue to make them passable to fish. - Recreation features include: 2,500 feet of trail along and north of Arroyo Mocho, south of Oak Business Park. - Link between proposed trail to the trail east of Isabel Avenue. A pedestrian bridge or trail undercrossing will be evaluated at pre-design stage. 1 interpretive kiosk at location of proposed Arroyo Mocho bypass.
Capital Cost Estimate	\$11,030,000
Implementation Issues	- Space constraints along existing Arroyo Mocho alignment and constraints associated with the Arroyo Mocho to Lake H diversion. - Coordination with Quarry operators, City of Livermore, LARPD, and City of Pleasanton. - Permitting in compliance with CWA Section 401/404. - Coordination with RWQCB, CDFG
Project Precursors	- Conduct facilities/operations planning for Arroyo Mocho diversion and detention storage in Chain of Lakes. - Conduct hydrologic/hydraulic modeling to determine if proposed improvements for this project are adequate to increase the capacity of the current Arroyo Mocho channel from 900 cfs to 1,300 cfs (flow remaining after diversion to storage).
Project Benefits	- Enhance Arroyo Mocho as potential future steelhead corridor. - Use Arroyo Mocho as a recreation corridor. Provide connectivity to regional trails system.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: A, C Recreation, Trails, and Public Education: B, C, D, E, F

Maintenance Activities	Vegetation maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on chemical clearing of invasive species which includes conducting a biological survey and implementing a water quality sampling plan. • Collect and dispose of vegetation debris. Maintenance of trails: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$290,000
Notes	• Existing wetland west of Isabel Avenue should be utilized as part of the stream habitat. • An undercrossing can be evaluated phase as an option to the construction of a pedestrian bridge (Project Component 6). • Assumes stream would be dry during construction activities and therefore dewatering would not be required. • Assumes vegetation management will restore capacity in Arroyo Mocho to 1,300 cfs based on reduction in channel roughness; a detailed analysis should be done as part of pre-design.
References	• Arroyo Mocho & Arroyo Las Positas Management Plans: Initial Findings and Recommendations, Philip Williams & Associates Ltd., December 8, 2000 • Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 • Specific Plan for Livermore-Amador Valley Quarry Reclamation, 1981 • RMC Draft TM: Project Refinements - Frequency of Storage, September 8, 2004



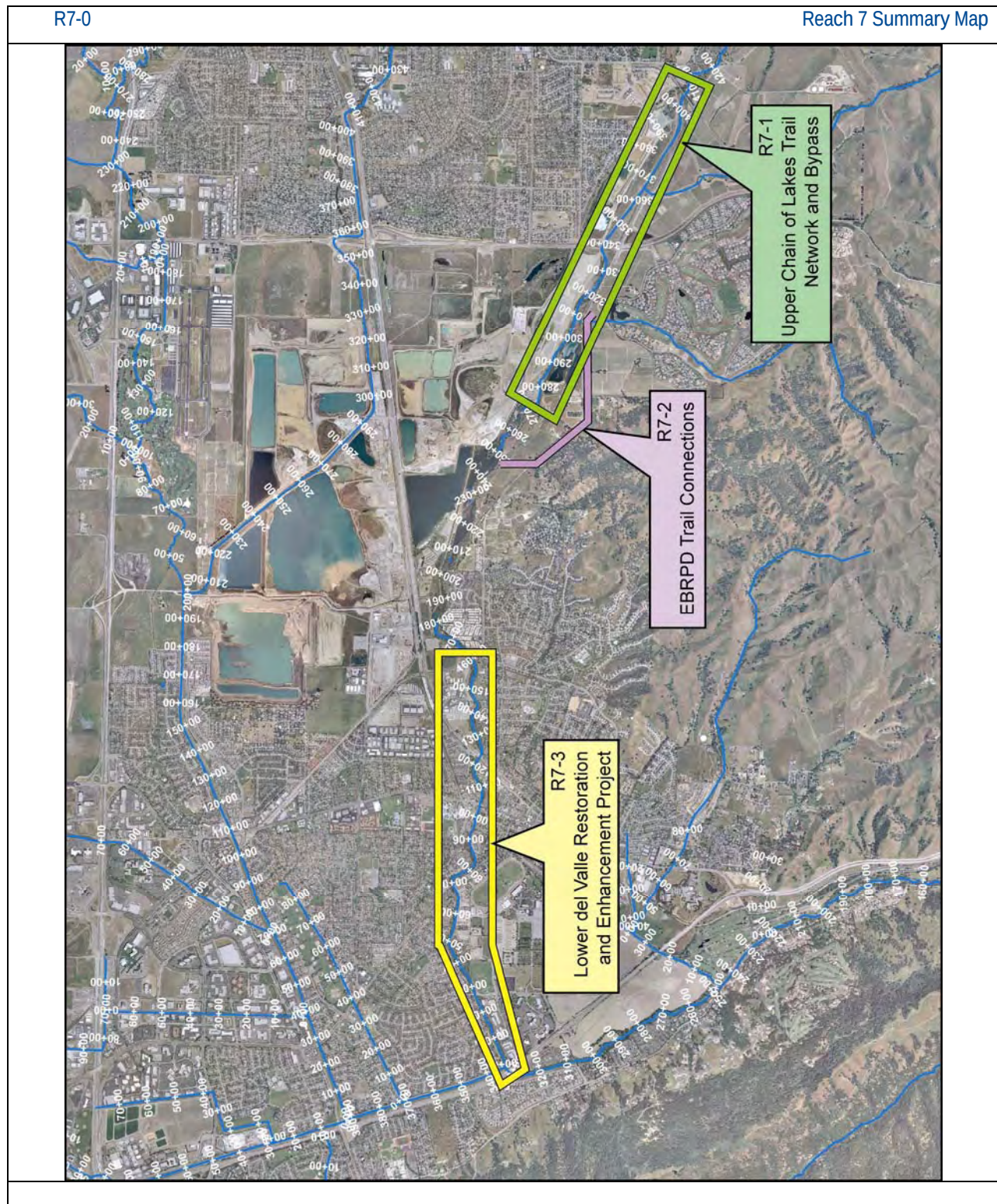
Project Number	R6-2
Project Name	Arroyo Mocho Bypass and Regional Storage at Chain of Lakes
Project Location	Arroyo Mocho bypass will be at Station 340+00. Arroyo Mocho bypass alignment will parallel the western end of the Oak Business Park development, around Lake E and north of Lakes F and G into Lake G and Cope Lake.
Purpose	Arroyo Mocho is currently undersized, with a capacity of 900 cfs compared to projected future 100-year storm flows of approximately 4,800 cfs. The proposed project is expected to alleviate flooding along Arroyo Mocho by diverting and detaining 3,500 cfs of Arroyo Mocho flows into the Chain of Lakes. In addition, the proposed project would provide regional storage for the Livermore-Amador Valley and reduce downstream flooding along Arroyo de la Laguna.
Project Components	A. Arroyo Mocho Bypass: 1. Construct a passive overflow structure at Station 340+00 on Arroyo Mocho such as a broad crested ogee-type weir. 2. Construct approximately 11,000 feet of new earthen-lined, excavated-cut channel along east side of Lake E, along north side of Lakes F and G, and into Cope Lake and Lake G independently. 3. Land acquisition (approximately 50 acres) B. Storm Water Return from Cope Lake and Lake G: 1. Install Cope Lake Pump Station (including fish screens). 2. Widen Arroyo Mocho downstream of Cope Lake. C. Arroyo Mocho Trail System: 1. Construct approximately 4,500 feet of multi-purpose trail along Arroyo Mocho bypass connecting to Jack London Blvd with access to the public park planned for the Oaks Business Park. 2. Construct 4.2 miles of trail (along the road) from the Isabel Ave. cantilever bridge along Isabel Ave., Stanley Blvd, and improved El Charro Rd. to connect to existing trail along Arroyo Mocho (STA 190+00 to 0+00).
Cost Estimate	\$129,400,000
Implementation Issues	• Coordination with plans for mining new lakes by the quarry operators. • Addressing potential conflicting uses of the Chain of Lakes. • Coordination with transportation plans along current Arroyo Mocho alignment. • Right-of-way issues in COL area. • Coordination with local developments along the Chain of Lakes (such as the Oak Business Development) and local agencies to allocate the existing space to solve the regional flooding problem. • Permitting in compliance with CWA Section 401/404. • Coordination with City of Pleasanton regarding Rancho El Charro, and the proposed improvements to El Charro Road. • Development of SMP 38, SMP 39, and SMP 40.
Project Precursors	• Conduct facilities/operations planning for Arroyo Mocho bypass and detention storage at the Chain of Lakes. • Conduct hydrologic/hydraulic modeling to determine if proposed improvements of Project R.6-2 are adequate to increase the capacity of the current Arroyo Mocho channel from 900 cfs to 1,300 cfs (flow remaining after diversion to storage). • Assess the financial and environmental benefits of returning stored flows to Arroyo del Valle versus Arroyo Mocho. • Oak Business Park needs to complete improvements of initial bypass section.
Project Benefits	• Addresses Arroyo Mocho capacity deficiency. • Conveys flood flows to Chain of Lakes for storage on a 5 to 10 year frequency. • Minimizes flooding along Stanley Blvd.

	- Provides regional storage for Livermore-Amador Valley. - Storage in Lakes could be utilized for water supply purposes. - Provides a water quality benefit through removal of sediment via storage.
Goals/Objectives Addressed	Flood Protection & Drainage: A, B, E Erosion and Sedimentation: none Water Supply: A, C, D, E Water Quality: B Habitat & Environment: none Recreation, Trails, and Public Education: C, D, G
Maintenance Activities	For components A and B, a maintenance procedure will be developed in the design phase. Maintenance of trails: - Conduct annual inspection of trails. - Seal cracks and repair pavement on trails, as needed. - Clear debris and vegetation growth, as needed. - Repair signs and structures, as needed.
Maintenance Cost Estimate	\$1,049,000
Notes	- The City of Pleasanton plans to improve El Charro Road alignment between 2005 and 2010, based on their 1996 General Plan. - Development of SMP 38, SMP 39, and SMP 40 will affect proposed project.
References	- Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 - Specific Plan for Livermore-Amador Valley Quarry Reclamation, 1981 - City of Pleasanton General Plan. August 6, 1996 - Phone conversation with Janice Stern (Planning Department – City of Pleasanton) on September 7, 2005 - Alameda County, 2003 - City of Livermore, 2003 - Alameda County Community Development Agency, 2002



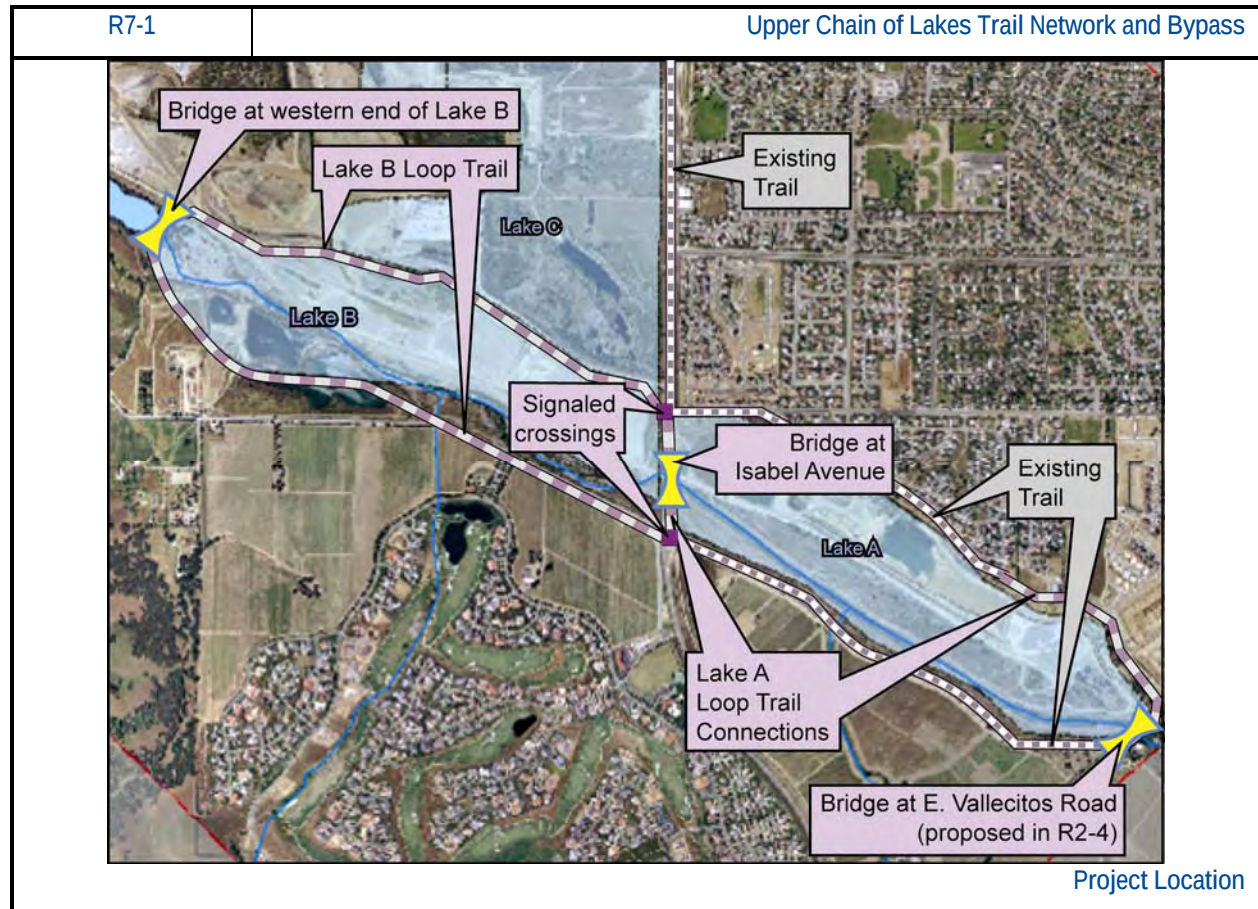
R7-0

Reach 7 Summary Map

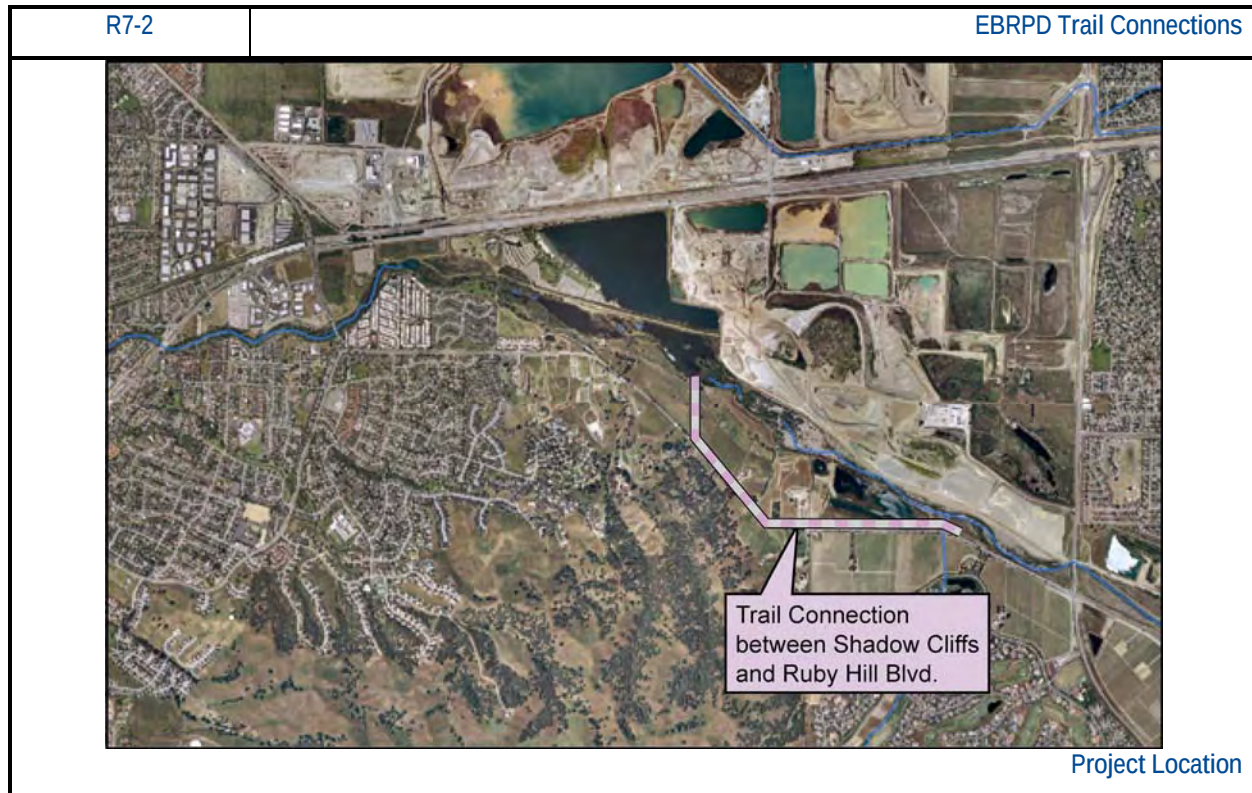


Project Number	R7-1
Project Name	Upper Chain of Lakes Trail Network
Project Location	Arroyo del Valle (STA 400+00 to 260+00), Lakes A and B
Purpose	Construct a recreational trail network around Lakes A and B that will be linked to the existing trail along Isabel Avenue and to trail connecting to Sycamore Grove Park proposed under R.4-2.
Project Components	- Construct trail connections, including: 3.0 miles of trail to complete trail loop around Lake B. 0.5 miles of trail to complete trail loop around Lake A. 2 pedestrian bridges across Arroyo del Valle at Isabel Avenue along the existing Isabel Avenue bridge, and at the western end of Lake A. 4 traffic signals at Isabel Avenue. 2 signaled crossings. - Project includes acquisition of approximately 5.0 acres of land.
Capital Cost Estimate	\$6,790,000
Implementation Issues	- Coordination with EBRPD and LARPD. - Coordination with RMC Pacific with respect to mining operations and timing of land availability. - Coordination with the Chain of Lakes Master Plan and Caltrans regarding planned improvements along Highway 84/Isabel Avenue. - Limited land availability in quarry area. - Public safety: trails are located near steep embankments.
Project Precursors	- Completion of quarry operations along and north of Arroyo del Valle before implementation of loop trail around Lake B. - Recreation demand/interest study to identify recreational needs and maximize recreational opportunities along Arroyo Mocho in the Chain of Lakes area. - Permits acquisition from regulatory agencies.
Project Benefits	- Provides additional recreational opportunities in the Chain of Lakes area. - Extends recreational trail network. - Provides connection to existing trails.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: none Recreation, Trails, and Public Education: C, D, F, G
Maintenance Activities	Trail Maintenance: - Conduct annual inspection of trails. - Seal cracks and repair pavement on trails, as needed. - Clear debris and vegetation growth, as needed. - Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$154,000

Notes	• The project assumes that Lakes A and B will be completed as a result of quarry operations occurring along Arroyo del Valle. • Potential to use Lake B as a more intensive recreational area (including water contact activities) if it is effectively removed from the Chain of Lakes. Final use of Lake B will depend on design features of Lake B outlet, impacts of removing Lake B from the Chain of lakes, future water supply needs and the need for such recreational features. Design features may be needed to isolate Lake B from Lake A. • Potential to use this area for program-wide SMMP mitigation, stockpiling and storage of equipment. • Isabel crossings: Can be limited to 1 road crossing if there are 2 protected lanes (one on each side). Also, a signal crossing would be an alternative to the fly-over bridge depending on amount of traffic, both vehicular and recreational.
References	• Specific Plan for Livermore-Amador Valley Quarry Area Reclamation, November 5, 1981 • East Bay Regional Park District Master Plan 1997, December 17, 1996 • City of Livermore Bikeways and Trails Master Plan, Wilbur Smith Associates, December 11, 2001 • Personal communication with Zone 7 Staff, Summer 2003.

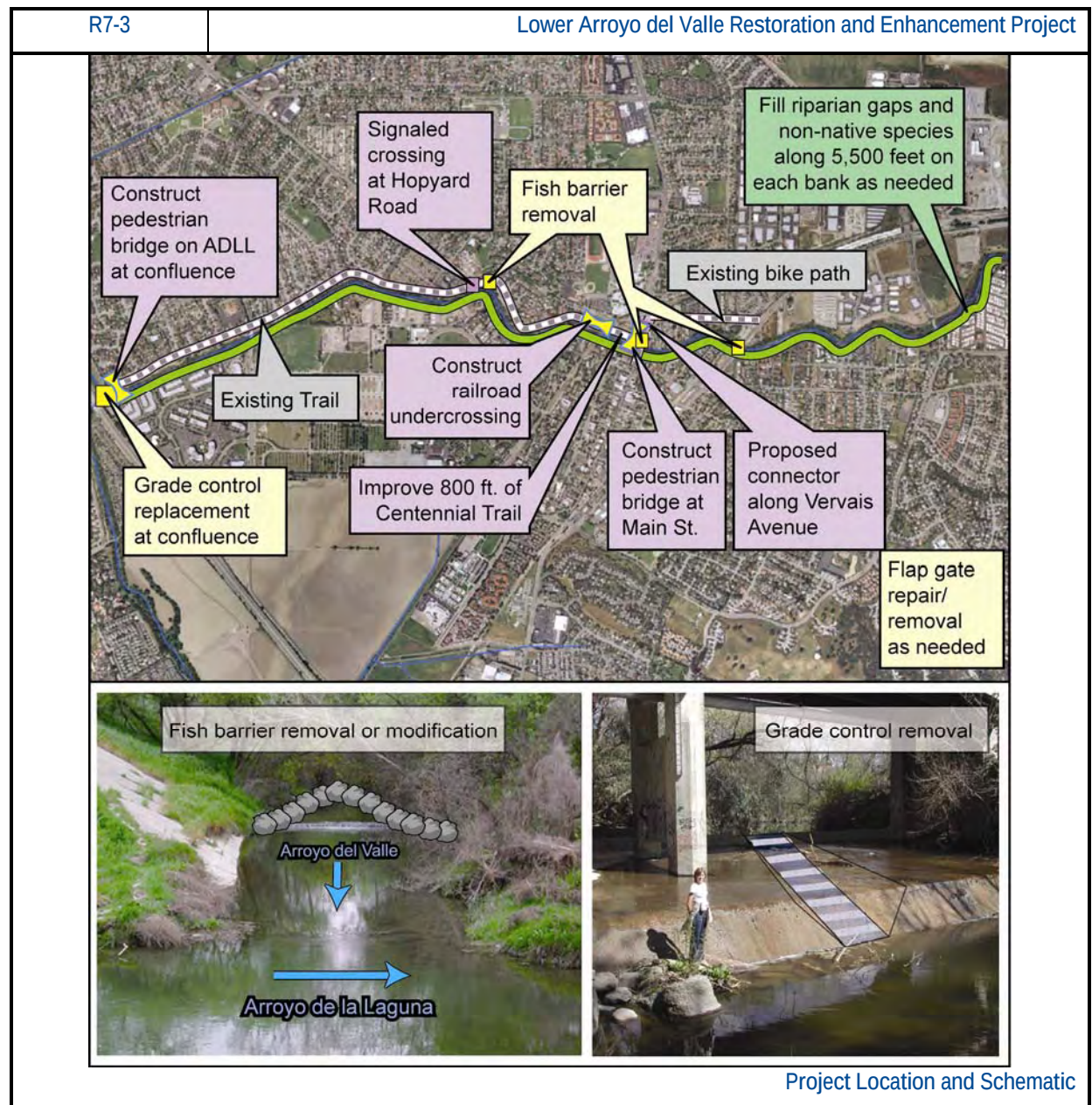


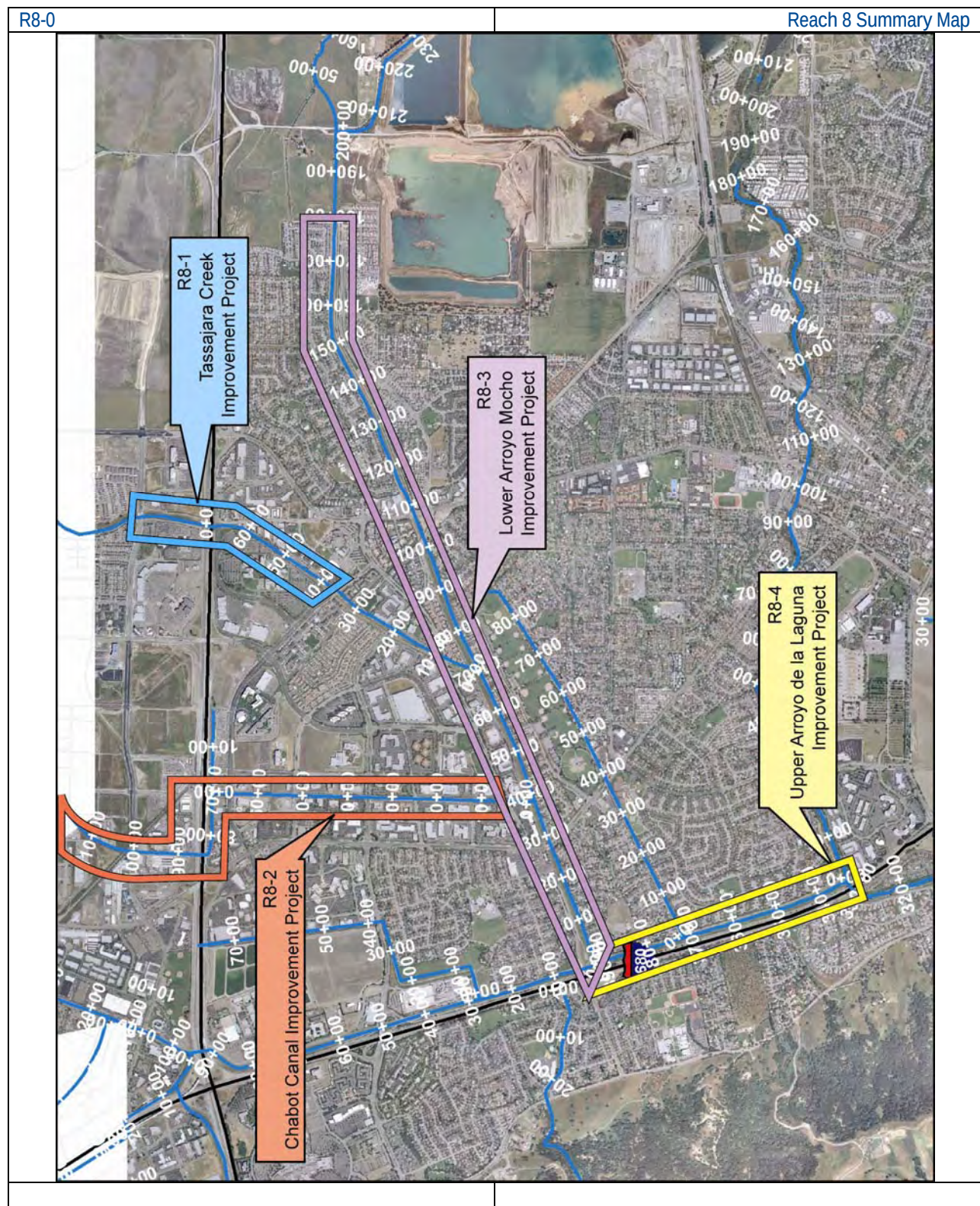
Project Number	R7-2
Project Name	EBRPD Trail Connections
Project Location	Along Arroyo del Valle (STA 315+00 to 245+00) parallel to Vineyard Avenue from Ruby Hills Drive to Shadow Cliff Lake
Purpose	Create a system of regional trails and provide connection to existing EBRPD trail segments.
Project Components	1. Construct 8,000 feet of new trail to connect the southeast portion of Shadow Cliffs to the Lake B Loop Trail proposed in project R.7-1. Project includes acquisition of 3.7 acres of land for trail (8,000 feet x 20 feet).
Capital Cost Estimate	\$1,920,000
Implementation Issues	• Coordination with EBRPD
Project Precursors	-
Project Benefits	• Extends recreational trail network. • Provides connection to existing trails. • Provides additional recreational opportunities in the Chain of Lakes area.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: none Recreation, Trails, and Public Education: D,G
Maintenance Activities	Trail Maintenance: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$68,000
Notes	• Project should be implemented in coordination with projects R.7-1 and R.4-2.
References	• City of Livermore Bikeways and Trails Master Plan, Wilbur Smith Associates, December 11, 2001 • Personal communication with Jim Townsend, EBRPD, 2003.



Project Number	R7-3
Project Name	Lower Arroyo del Valle Restoration and Enhancement Project
Project Location	Arroyo del Valle downstream of Bernal Ave. to confluence with Arroyo de la Laguna at I-680 (STA 170+00 to 0+00)
Purpose	• Improve fisheries habitat in Arroyo del Valle by removing fish barriers and enhancing the riparian corridor. • Create a system of regional trails by linking existing trail segments.
Project Components	1. Provide trail improvements and connections: • Construct bike connection along 0.3 miles along Vervais Avenue, north on Santa Rita Road to existing bike lane along Stanley Blvd. • Install pedestrian and bike signaled crossing at Hopyard Road. • Improve approximately 800 feet of Centennial Trail ending at Main Street. • Construct a pedestrian bridge at Main Street. • Construct a pedestrian bridge above Arroyo del Valle at confluence with Arroyo de la Laguna. • Construct a pedestrian and bike undercrossing at the railroad tracks at Del Valle Parkway. • Project includes acquisition of 0.9 acres of land. 2. Remove existing fish barriers: • Remove three fish barriers at the Division Street/Hopyard Road (station 70+00), Main Road/Santa Rita Road (station 104+00) and First Street/Stamley Boulevard (station 123+00) crossings. • Replace drop structure on Arroyo del Valle at the end of Corte Monterey, 150 feet upstream of the confluence of Arroyo del Valle and Arroyo de la Laguna with a fish passable structure such as a rock weir. 3. Conduct vegetation management: • Fill riparian gaps and replant approximately 5,500 feet on each bank of Arroyo del Valle from Bernal Avenue to the confluence with ADLL. Project includes acquisition of 12.6 acres of land. • Remove non-native species along riparian corridor of Arroyo del Valle. 4. Repair necessary flap gates and remove unnecessary flap gates.
Capital Cost Estimate	\$23,750,000
Implementation Issues	• Coordinate with Southern Pacific to obtain permissions to cross railroad right-of-way (ROW). • Coordinate fish barrier removal with regulatory agencies such as the California Department of Fish and Game, U.S. Fish and Wildlife Service, and local stakeholder groups including the Alameda Creek Alliance. • Coordinate bike trail connections along city streets with City of Pleasanton.
Project Precursors	• Develop maintenance plan for existing and future trails. • Storm Drain Evaluation Study: • Identify flap gates and outfalls in need of repair or removal. • Identify outfalls that have a need for flap gates. • Vegetation Management Study: • Develop hydraulic/hydrologic modeling for Arroyo del Valle. • Create weighted average for channel roughness and apply to model. • Develop vegetation location and density parameters. • Restrict growth based on above parameters.
Project Benefits	• Provides regional trail connectivity. • Reduces local flooding caused by leaking flap gates. • Better looking channel with improved outfalls. • Improves fish passage for both warm water and coldwater species by removing fish barriers. • Improved habitat/conveyance balance through vegetation management.

Goals/Objectives Addressed	Flood Protection & Drainage: A, E Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: B, C Recreation, Trails, and Public Education: C, D, F, G
Maintenance Activities	Trail Maintenance: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed. Vegetation Maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on hand removal of riparian vegetation. In addition, invasive species control assumes herbicide application on the third of the total area annually, implementation of an herbicide monitoring program, a biological survey and mitigation for herbicide application. • Collect and dispose of vegetation debris.
Annual Maintenance Cost Estimate	\$456,000
Notes	• Arroyo del Valle has been identified as potentially suitable for steelhead spawning and rearing. Benefits for warm water species and steelhead associated with barrier removal in Arroyo del Valle would be more limited than benefits associated with the ADLL/Arroyo Mocho corridor. • Potential to this area for program-wide SMMP mitigation, such as riparian/wetlands restoration and fisheries enhancements. • Potential to use material excavated as a potential source of construction/road material.
References	• Evaluation of the Potential Historical and Current Occurrence of Steelhead within the Livermore-Amador Valley, Dr. Charles H. Hanson; Dr. Janet Sowers & Dr. Allen Pastron, August 2004. • An Assessment of the Potential for Restoring a Viable Steelhead Trout Population in the Alameda Creek Watershed, Gunther et al. (Applied Marine Sciences; Hagar Environmental), February 7, 2000. • Draft Steelhead Restoration Action Plan for the Alameda Creek Watershed, Center for Ecosystem Management and Restoration, February 2003



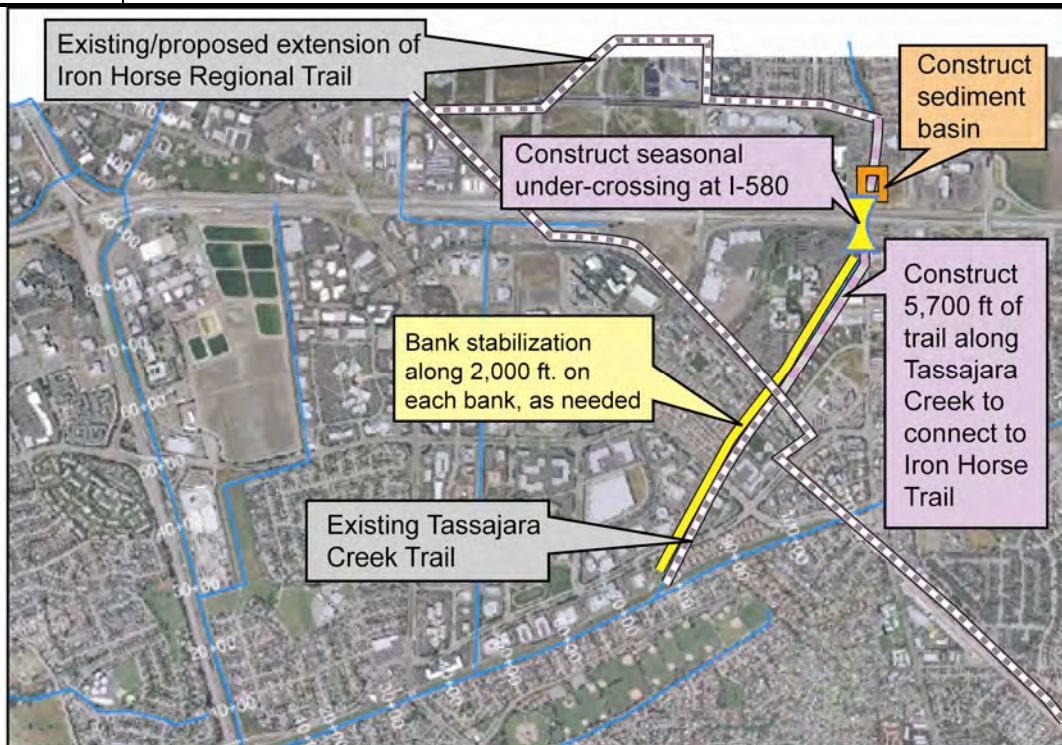


Project Number	R8-1
Project Name	Tassajara Creek Improvement Project
Project Location	Tassajara Creek at I-580 crossing and upstream (STA 86+00 to 00+00)
Purpose	Alleviate capacity problems in lower reach of Arroyo Mocho by trapping sediment loads from Tassajara Creek in sediment basin. Promote regional trail connectivity by providing linkage between areas north and south of I-580.
Project Components	- Construct trail connections, including: 5,100 feet of trail along Tassajara Creek from Owens Drive to Dublin Boulevard. - Under-crossing to allow for seasonal passage under I-580. - Construct a sediment basin to trap sediment in vicinity of I-580. Estimated size of basin is 1.8 AF. Project includes creation of approximately 0.9 acres of wetlands as environmental mitigation. - Construct 2,000 feet of bank stabilization on each bank as needed from to I-580 to confluence with Arroyo Mocho (STA 60+00 to 0+00).
Capital Cost Estimate	\$8,830,000
Implementation Issues	- Coordination with Caltrans, BART, the City of Dublin, and the City of Pleasanton with respect to undercrossing design. - Coordination between the City of Dublin and Zone 7 regarding a License Agreement to allow public access across Zone 7 property. - Coordination between Zone 7, the City of Dublin and EBRPD regarding a Sublicense Agreement for maintenance and operation of the trail. - Safety issues associated with trail under-crossing. - Permitting in compliance with CWA Section 401/404. - Conduct sediment transport study prior to project implementation to confirm size of sediment basin.
Project Precursors	-
Project Benefits	- Reduces sediment accumulation in Arroyo Mocho. - Provides seasonal connection to the Iron Horse Trail north of I-580.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: A, C Water Supply: none Water Quality: C Habitat & Environment: none Recreation, Trails, and Public Education: C, D, G
Maintenance Activities	Trail Maintenance: - Conduct annual inspection of trails. - Seal cracks and repair pavement on trails, as needed. - Clear debris and vegetation growth, as needed. - Repair signs and structures, as needed. Sediment Basin Maintenance: - Conduct field inspection of sediment basin. - Conduct sediment sampling prior to sediment removal and prepare Sediment Characterization Report. - If desilting activities are conducted in a "wet" stream, conduct water quality sampling prior to and after sediment removal. Prepare a Water Quality Sampling Plan. - Dewater side if desilting activities are conducted in a "wet" stream. Conduct desilting activities. - Store and transport dredged material to an off-site landfill facility. - Conduct mitigation for sediment removal activities.

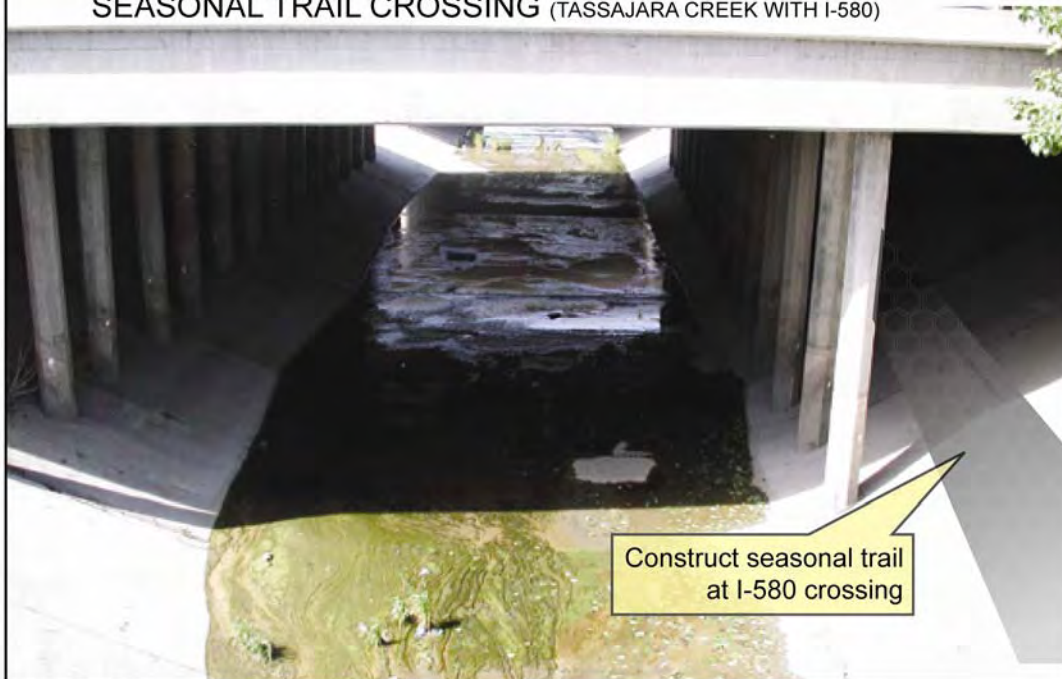
	Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Wetland Mitigation (Mitigation for sediment removal): • Conduct annual visual estimates of vegetative cover and species composition to estimate vegetative cover, species diversity, presence or absence of target and invasive species, and general abundance of individual plant species. Identify species survival rate. • Replace wetland vegetation, as needed, to maintain at least 50% surface area coverage after second growing season. • Conduct hand weeding of exotic plant species during the first three years to ensure there is no interference with the development and establishment of target wetland plant species. • Conduct annual routine maintenance activities including access road maintenance, and debris removal.
Annual Maintenance Cost Estimate	\$327,000
Notes	• Tassajara Creek has an extensive riparian habitat immediately upstream of proposed sediment basin. Sediment is currently dropping out in this reach naturally due to the velocity reduction caused by extensive in-stream vegetation. • The lower portion of Tassajara Creek was identified as an aggradational reach by West Yost Associates. • Schaaf & Wheeler identified this reach of Tassajara Creek as having adequate capacity and velocity criteria.
References	Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001

R8-1

Tassajara Creek Improvement Project



SEASONAL TRAIL CROSSING (TASSAJARA CREEK WITH I-580)



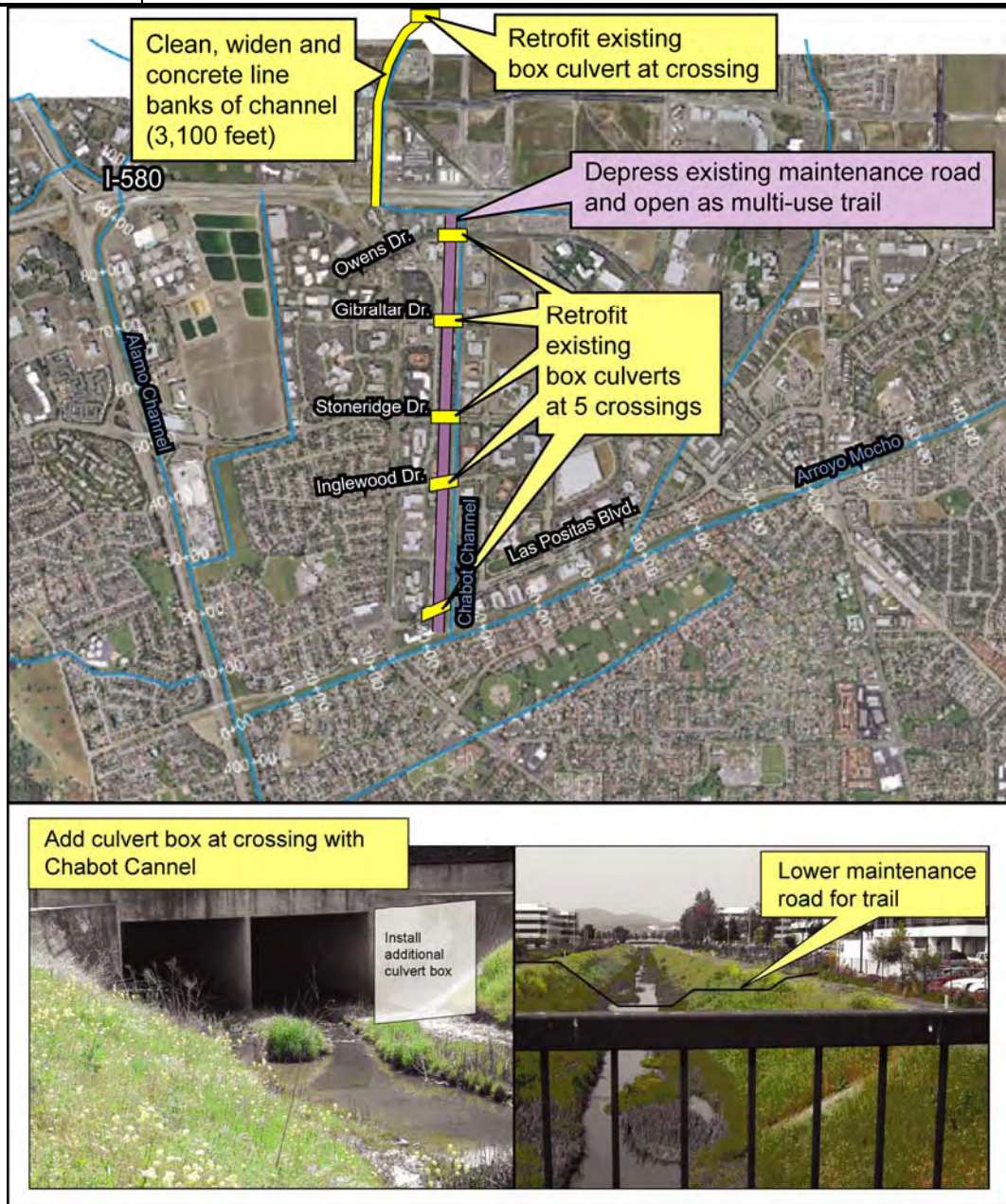
Project Location and Schematic

Project Number	R8-2
Project Name	Chabot Canal Improvement Project
Project Location	Chabot Canal upstream of Arroyo Mocho and Chabot Canal upstream of I-580 (STA 5+00 – STA 120+00).
Project Purpose	Increase Chabot Canal capacity to convey projected future 100-year storm flows from existing and planned developments. Extend system of regional trails.
Project Components	- Increase Chabot Canal capacity downstream of I-580 (STA 65+00 – STA 5+00): - Construct additional box culverts at five crossings (Owens Drive, Gibraltar Drive, Stoneridge Drive, Inglewood Drive, and Las Positas Blvd.) to increase conveyance capacity. - Lower one levee maintenance road to increase capacity. Maintenance road will be paved to comply with Zone 7 standards for maintenance roads located below the 100-year flood elevations. - Increase capacity of Chabot Canal upstream of I-580 (STA 120+00 to 89+00): - Clean and widen Chabot Canal upstream of I-580. - Concrete line banks of Chabot Canal upstream of I-580. - Retrofit culvert at railroad tracks, north of Dublin Boulevard. The project includes creation of 5.4 acres of wetlands as environmental mitigation for concrete lining and sediment removal. - Implement trail extensions by opening: - Maintenance road for use as multi-purpose trail from the Las Positas Blvd. crossing to the Dublin/Pleasanton BART Station (STA 65+00 to 5+00).
Capital Cost Estimate	\$18,420,000
Implementation Issues	- Coordination with Caltrans, BART, the City of Dublin, the City of Pleasanton, Hacienda Business Park, and developers of Camp Parks Reserve Forces Training Area (PRFTA) property. - Permitting in compliance with CWA Section 401/404. - Channel lining will result in unmitigable wetland loss.
Project Precursors	- Conduct Storm Drain Evaluation Study to compare storm drain flow into Chabot Canal with Schaaf & Wheeler modeling results. - Conduct hydrologic/hydraulic modeling of Chabot Canal watershed to assess the need for additional box culverts at all 5 crossings. Model should include evaluation of stormwater runoff increases resulting from the proposed Parks PRFTA development on peak flows in Chabot Canal.
Project Benefits	- Addresses local flooding upstream of I-580. - Conveys the 100-yr flood in Chabot Canal. - Extends system of Regional Trails by connecting Chabot Canal to BART and proposed Iron Horse Trail.
Goals/Objectives Addressed	Flood Protection & Drainage: B, E Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: none Recreation, Trails, and Public Education: D, G
Annual Maintenance Activities	Culvert maintenance: - Conduct annual inspection of 5 culverts. - Collect and dispose of vegetation debris. Concrete Lining: - Conduct annual inspection of concrete-lined section. - Repair concrete layer, as needed. Trail Maintenance: - Conduct annual inspection of trails.

	• Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed. Wetlands Maintenance (mitigation): • Conduct annual visual estimates of vegetative cover and species composition to estimate vegetative cover, species diversity, presence or absence of target and invasive species, and general abundance of individual plant species. Identify species survival rate. • Replace wetland vegetation, as needed, to maintain at least 50% surface area coverage after second growing season. • Conduct hand weeding of exotic plant species during the first three years to ensure there is no interference with the development and establishment of target wetland plant species. • Conduct annual routine maintenance activities including access road maintenance, and debris removal.
Maintenance Cost Estimate	\$58,000
Notes	• Chabot Canal was originally designed to convey the 15-year flood event and allow the local parking lots to be flooded in greater storms. In its analysis, Schaff & Wheeler determined that this reach did not meet the freeboard criteria even for a 15-year event. • The current project is based on criteria that would require all channels draining more than 1 square mile to convey the 100-year flood. The final project will depend on the selection of the design criteria and the precursors listed above. If it is determined that lesser design criteria should be applied, a smaller scale project that does not include major conveyance improvements could be implemented. • The city of Dublin has initiated a General Plan Amendment Study (GPA) to allow for the eventual transfer and private development of 187 acres of Army property on the south end of Parks RFTA. Storm runoff from this property currently discharges into Chabot Canal, and as a result could significantly increase storm flows. The potential increase in storm flows will have to be evaluated before the project components are finalized. • Regional Water Quality Control Board (RWQCB) representatives have expressed concerns at the SMMP workshops over concrete lining alternatives. • The lowering of Zone 7's maintenance road below the 100-year water surface elevation would require that the road be concrete. • Location of wetlands to be determined at programmatic level. • Area north of I-580 is proposed critical habitat for California Red-Legged Frog. Improvements north of I-580 should be made to minimize impacts on special-status species.
References	• Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 • Special Drainage Area 7-1 Fee Structure Update, Schaaf & Wheeler, June 30, 2000

R8-2

Chabot Canal Improvement Project



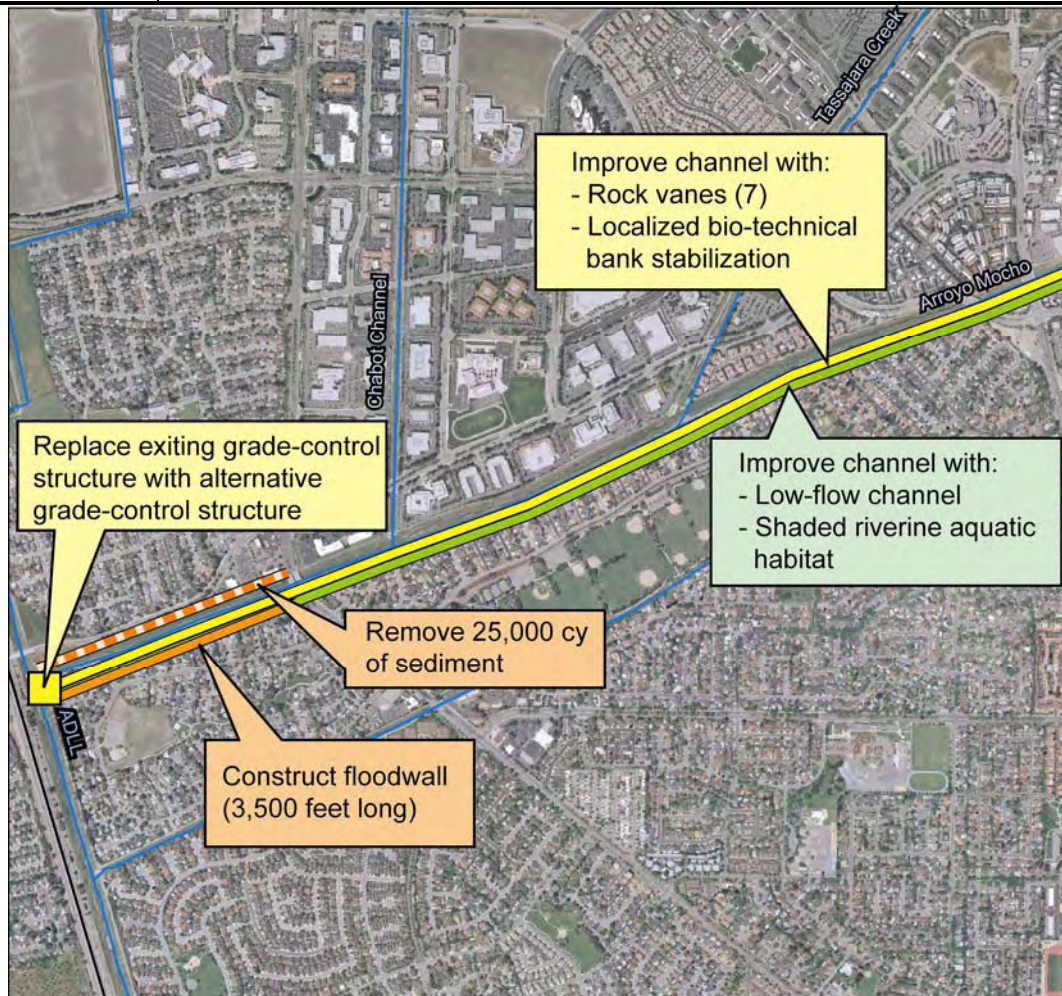
Project Location & Schematic

Project Number	R8-3
Project Name	Lower Arroyo Mocho Improvement Project
Project Location	Arroyo Mocho between the confluence with Arroyo de la Laguna and the confluence with Arroyo las Positas, between STA 0+00 and 170+00
Purpose	Remove sediment to curtail aggradation of Arroyo Mocho at confluence with Arroyo de la Laguna. Enhance in-stream aquatic habitat for steelhead.
Project Components	1. Remove sediment along 3,500 feet (one-time removal of up to 25,000 cubic yard) of Arroyo Mocho, from confluence with Arroyo de la Laguna to Hopyard Road to increase hydraulic capacity. Project includes creation of 8.2 acres of wetlands as environmental mitigation for sediment removal. 2. Build a new floodwall along Arroyo Mocho south of the maintenance road to provide adequate freeboard/flood protection (approximately 3,500 feet of 4 feet high floodwall from the confluence with ADLL to the Hopyard Road crossing). 3. Construct localized bio-technical bank slope stabilization measures along approximately 5,100 feet, ending 50' upstream of the confluence with ADLL. 4. Stabilizing channel bed by utilizing grade control structures such as rock vanes at 7 locations. 5. Conduct habitat enhancement, including: • Replacing the existing drop structure at confluence of Arroyo Mocho and Arroyo de la Laguna with an alternative grade-control structure such as a vortex rock weir suitable for fish passage. • Creating low-flow channel along 17,000 feet of Arroyo Mocho (STA 17+00 to 0+00; assuming a 1.25 meandering ratio). • Planting approximately 15.6 acres of shaded riverine aquatic cover on top of banks and slopes (STA 17+00 to 0+00; assuming 40 feet wide planting along 8,500 feet on each bank).
Capital Cost Estimate	\$29,830,000
Implementation Issues	• Permitting in compliance with CWA Section 401/404. • Coordination with RWQCB • Channel lining will result in unmitigable wetland loss.
Project Precursors	• Confirm need for sediment removal with hydrologic/hydraulic modeling of Arroyo Mocho assuming Chain of Lakes storage, proposed riparian enhancement and existing sediment conditions. • Conduct geomorphology study to determine the meandering characteristics of the proposed low-flow channel. • Conduct Storm Drain Evaluation Study for revised hydraulic gradeline determined above.
Project Benefits	• Creates adequate channel capacity while incorporating habitat enhancement measures. • Provide the Valley Trails neighborhood with adequate freeboard/flood protection. • Promotes restoration efforts along ADLL and Arroyo Mocho, both identified as potential spawning and rearing habitat for steelhead.
Goals/Objectives Addressed	Flood Protection & Drainage: A, B, C Erosion and Sedimentation: A, B, C Water Supply: none Water Quality: C, E Habitat & Environment: B, C, E, F Recreation, Trails, and Public Education: C, E
Annual Maintenance Activities	Vegetation Maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The

	annual maintenance cost estimate is based on hand removal of riparian vegetation. - Collect and dispose of vegetation debris. Maintenance of bank stabilization measures: - Conduct annual inspection of site. - Conduct repairs of bank stabilization measures, as needed. Wetlands Maintenance (mitigation): - Conduct annual visual estimates of vegetative cover and species composition to estimate vegetative cover, species diversity, presence or absence of target and invasive species, and general abundance of individual plant species. Identify species survival rate. - Replace wetland vegetation, as needed, to maintain at least 50% surface area coverage after second growing season. - Conduct hand weeding of exotic plant species during the first three years to ensure there is no interference with the development and establishment of target wetland plant species. - Conduct annual routine maintenance activities including access road maintenance, and debris removal.
Maintenance Cost Estimate	\$288,000
Notes	- Need for sediment removal should be assessed based on upstream storage of Arroyo Mocho and Arroyo las Positas flood flows in Chain of Lakes. - Floodwall along Arroyo Mocho to be set back as far as possible from channel. - Potential to modify the existing sound wall for use as a floodwall will be evaluated during the design phase. - Specific locations of bank stabilization measures and alternative grade-control structures will be determined during the design phase. - Location of wetlands and/or mitigation lands would be determined during the implementation phase at a project level in coordination with resources agencies. - Potential to use lower Arroyo Mocho for SMMP program-wide mitigation.
References	Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001

R8-3

Lower Arroyo Mocho Improvement Project



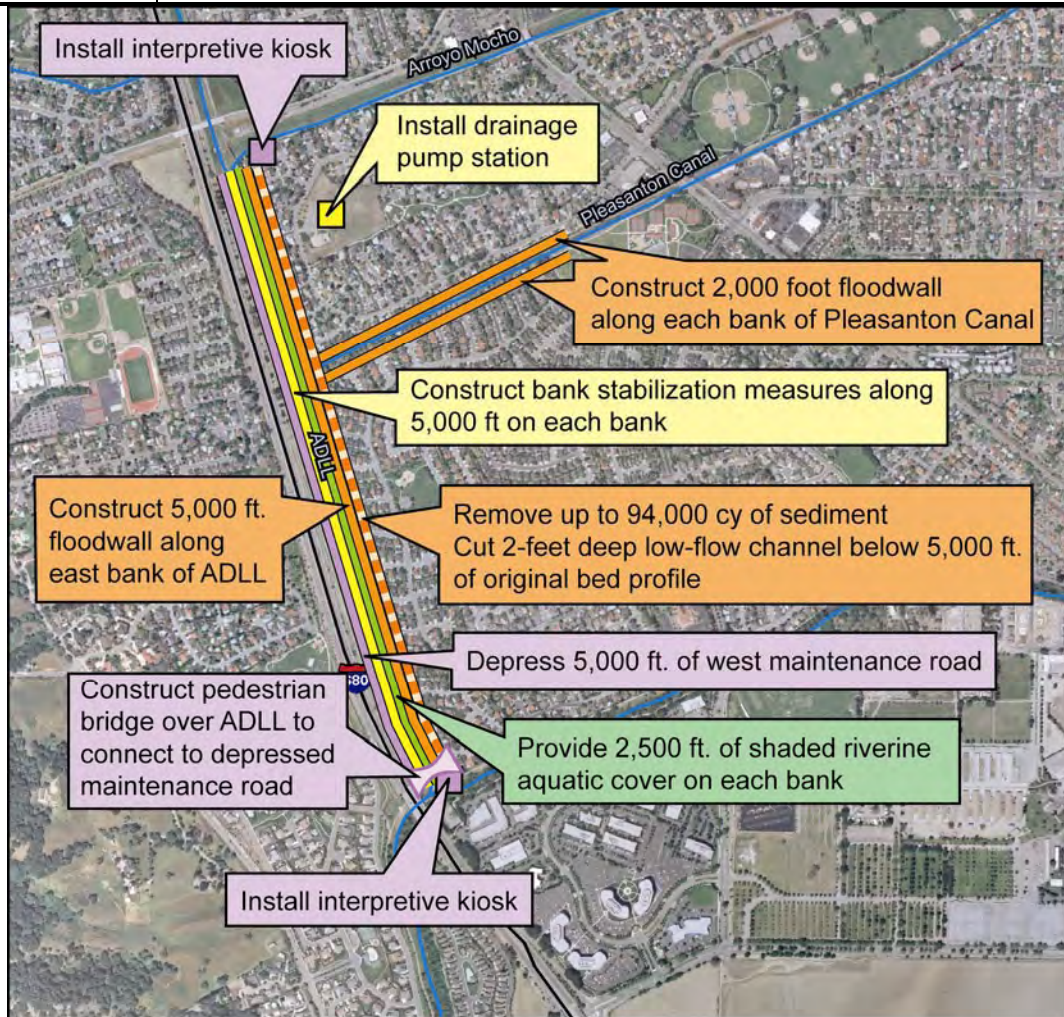
Project Location

Project Number	R8-4
Project Name	Upper Arroyo de la Laguna (ADLL) Improvement Project
Project Location	ADLL from confluence with Arroyo del Valle to confluence with Arroyo Mocho (STA 380+00 to 335+00)
Purpose	Protect properties from flooding during a 100-year flood event at build-out conditions. Restore the reach capacity through sediment removal. Enhance the in-stream aquatic habitat and restore steelhead passage along ADLL. Provide a recreational corridor with interpretive features for public use.
Project Components	1. Remove sediment (one-time removal of up to 94,000 cubic yards). Project includes creation of 9.2 acres of wetlands as environmental mitigation for sediment removal. 2. Depress 5,000 feet of west maintenance road along I-680. 3. Construct 5,000 feet of bank stabilization measures due to rotational failure along both sides of channel. 4. Build floodwalls at 2 locations: • 5,000 feet of 4 feet high floodwall to provide Valley Trails and the area south of Pleasanton Canal with adequate freeboard/flood protection (from confluence of ADLL with Arroyo del Valle to confluence with Arroyo Mocho). • 2,000 feet of 4 feet high floodwall along Pleasanton Canal to provide Valley Trails and Del Prado neighborhoods with adequate freeboard/flood protection (STA 0+00 – 20+00). 5. Install a drainage pump station to drain water out of the Valley Trails neighborhood and local areas east of ADLL. 6. Conduct habitat improvements, including: • Plant 5.7 acres of shaded riverine aquatic cover on top of banks and slopes (assuming 50 feet wide planting along 2,500 feet on each bank). • Create low-flow meandering channel along 5,000 feet of Arroyo de la Laguna by cutting 2 feet below original channel bed (assuming a meandering ratio of 1.25). 7. Recreational features include: • Constructing two interpretive kiosks at: 1) confluence of Arroyo del Valle and Arroyo de la Laguna; and, 2) confluence of Arroyo Mocho and Arroyo de la Laguna. • Constructing 1 pedestrian bridge over ADLL to connect maintenance roads on each side of ADLL immediately upstream of confluence of ADLL with Arroyo del Valle.
Capital Cost Estimate	\$50,600,000
Implementation Issues	• Coordination with Caltrans and City of Pleasanton. • Construction of Valley Trails improvements need to be coordinated with the City of Pleasanton. • Permitting in compliance with CWA Section 401/404.
Project Precursors	• Verify volume of sediment accumulated. • Conduct geotechnical evaluation of channel slopes to define appropriate bank stabilization measures. • Conduct geomorphology study to determine the meandering characteristics of the proposed low-flow channel. • Conduct hydrologic/hydraulic analysis to verify that channel capacity and freeboard is adequate after planned channel improvements are implemented (including sediment removal, depression of west maintenance road, and planting of shaded riverine aquatic cover), and to confirm need for floodwalls. • Conduct Storm Drain Evaluation Study.
Project Benefits	• Improves potential fisheries corridor from Alameda Creek to the upstream reaches

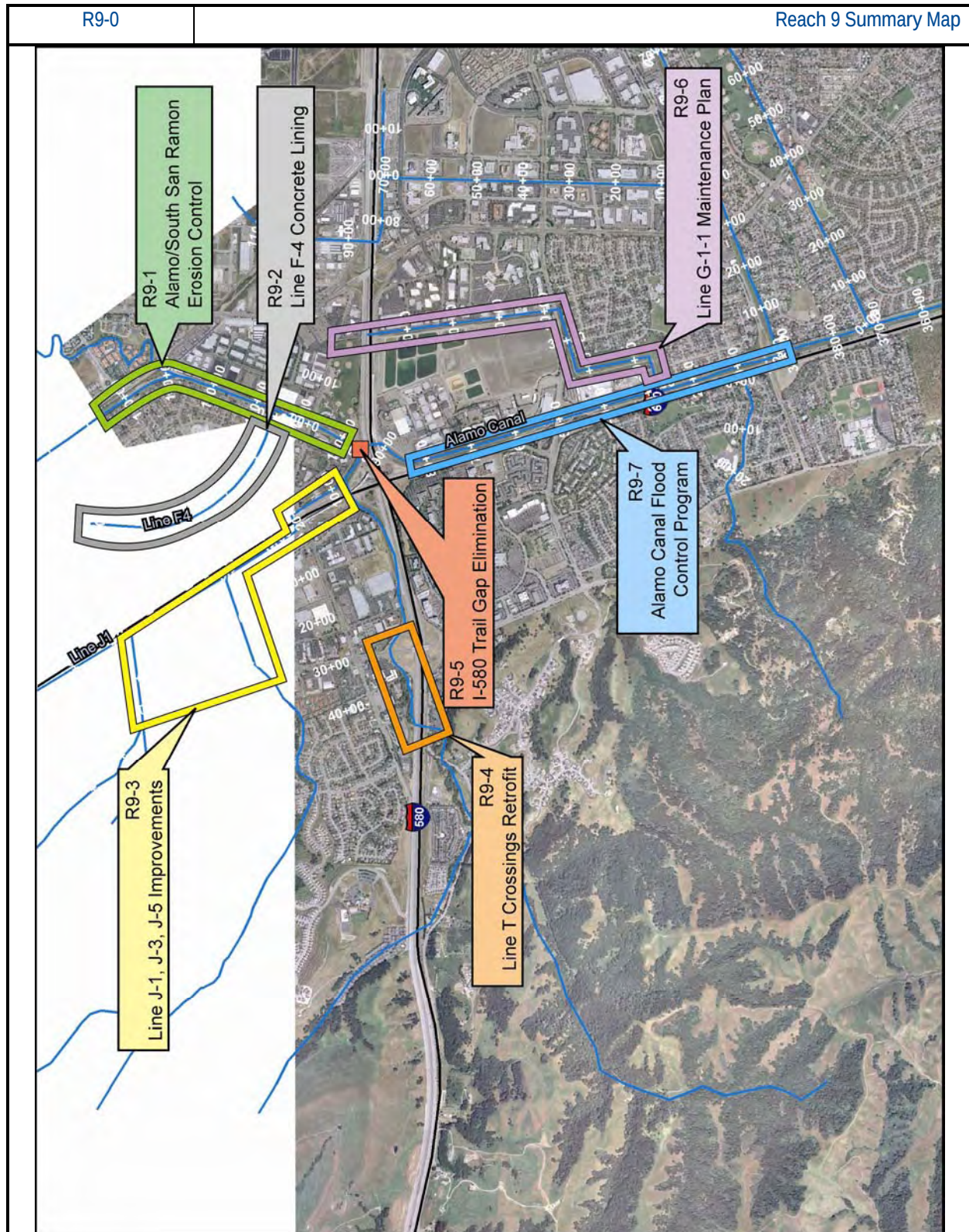
	of Arroyo Mocho. - Improves riparian habitat. - Restores channel capacity and provides adequate freeboard/flood protection. - Stabilizes existing bank erosion.
Goals/Objectives Addressed	Flood Protection & Drainage: A, B, C, D, E Erosion and Sedimentation: A, B, C Water Supply: none Water Quality: C Habitat & Environment: A, B, C, E Recreation, Trails, and Public Education: B, D
Annual Maintenance Activities	Vegetation Maintenance: - Conduct annual inspection of planted riparian vegetation. - Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on hand removal of riparian vegetation. - Collect and dispose of vegetation debris. Maintenance of bank stabilization measures: - Conduct annual inspection of site. - Conduct repairs of bank stabilization measures, as needed. Maintenance Road Maintenance: - Conduct annual inspection. - Seal cracks and repair, as needed. - Clear debris and vegetation growth, as needed. Pump Station: - Conduct annual inspection. - Repair, as needed. Interpretive kiosks: - Repair signs, as needed. Wetlands Maintenance (mitigation): - Conduct annual visual estimates of vegetative cover and species composition to estimate vegetative cover, species diversity, presence or absence of target and invasive species, and general abundance of individual plant species. Identify species survival rate. - Replace wetland vegetation, as needed, to maintain at least 50% surface area coverage after second growing season. - Conduct hand weeding of exotic plant species during the first three years to ensure there is no interference with the development and establishment of target wetland plant species. - Conduct annual routine maintenance activities including access road maintenance, and debris removal.
Maintenance Cost Estimate	\$872,000
Notes	- This reach is characterized by heavy sediment deposition and erosion of sediment deposited at the toe of banks. - This reach does not meet freeboard requirements under current conditions. - Location of wetlands to be determined at programmatic level.
References	Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001

R8-4

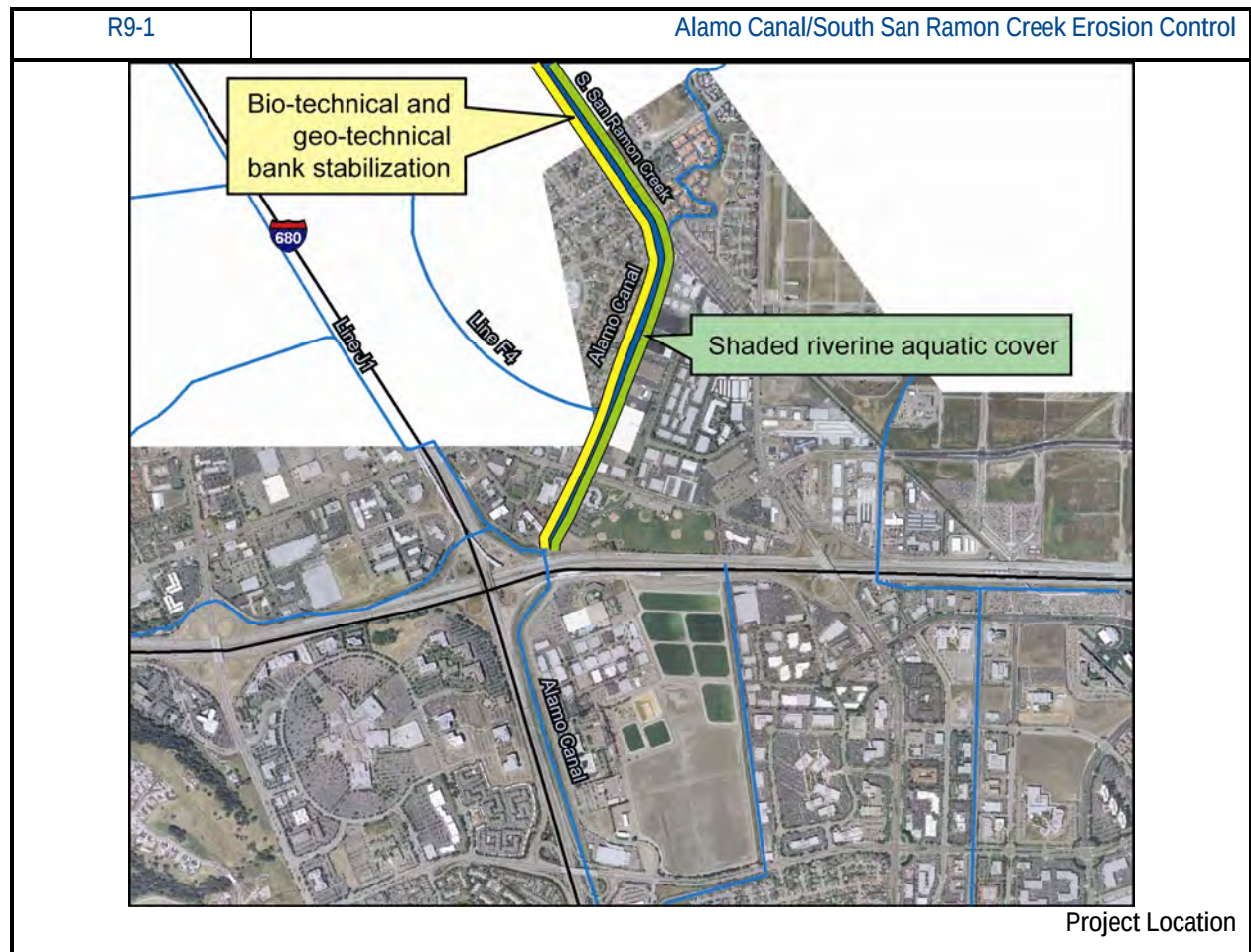
Upper Arroyo de la Laguna Improvement Project



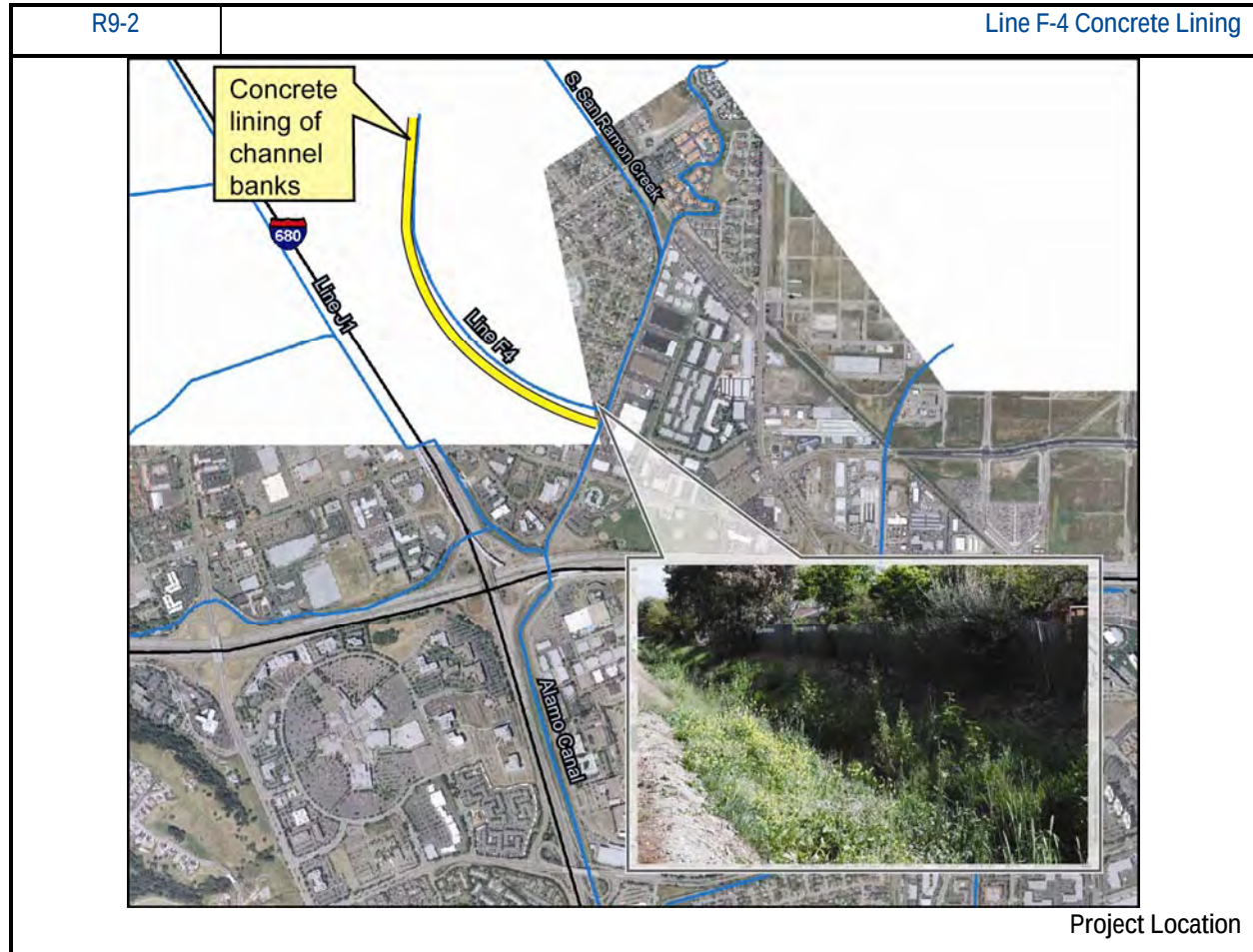
Project Location



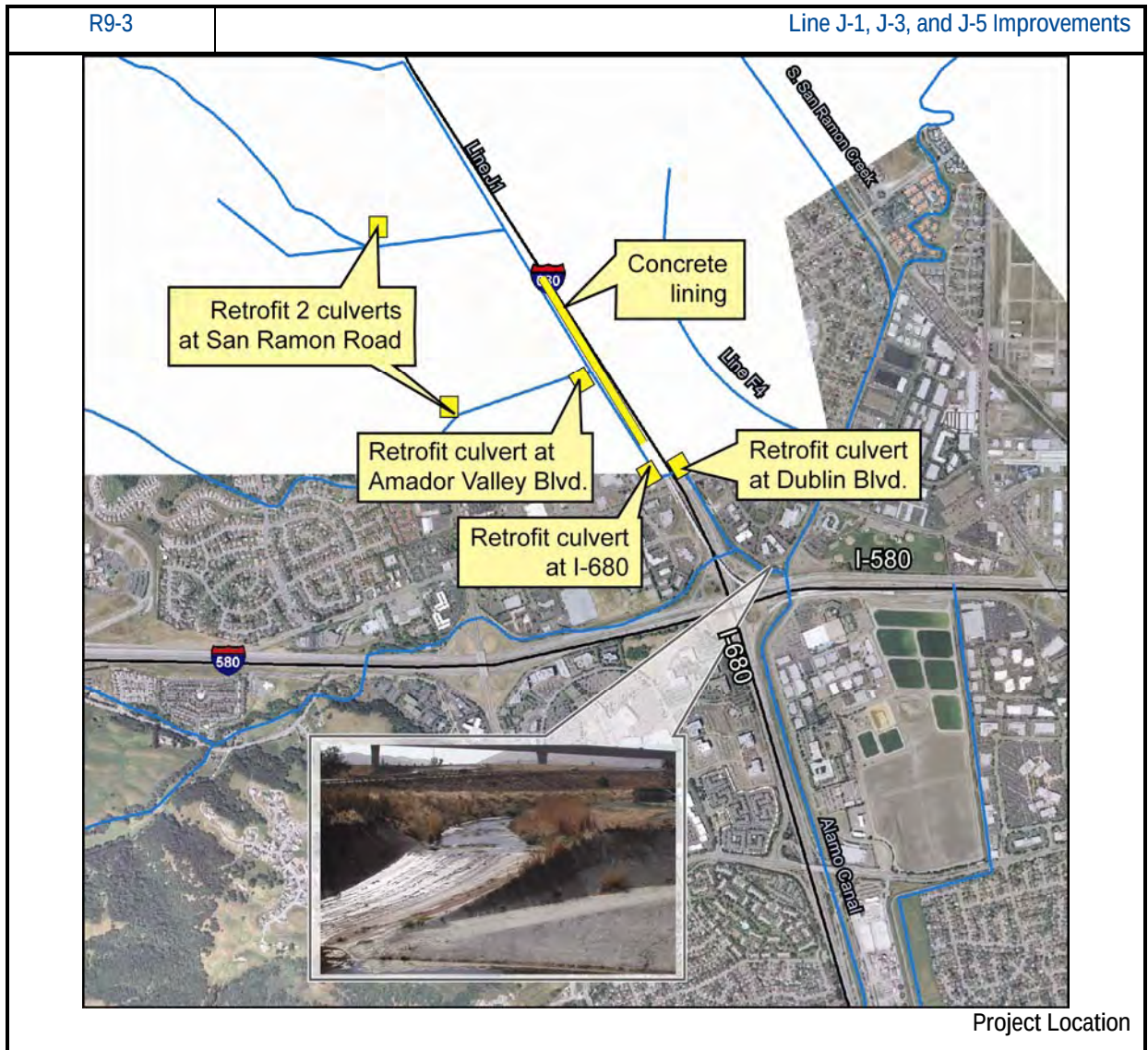
Project Number	R9-1
Project Name	Alamo Canal/South San Ramon Creek Erosion Control
Project Location	Alamo Canal north of I-580 (STA 135+00 to 100+00) South San Ramon Creek south of the Alameda/Contra Costa County line (STA 28+50 to 0+00)
Purpose	Stabilize the banks of Alamo Canal and South San Ramon Creek in order to decrease sediment load and curtail aggradation along the lower reaches of Alamo Canal.
Project Components	1. Stabilize banks, including: • 2,100 feet of channel (half of the channel length) along both banks of Alamo Canal using a combination of bio- and geo-technical bank stabilization methods. • 2,850 feet of channel banks along South San Ramon Creek using a combination of bio- and geo-technical bank stabilization methods such as geo-grid construction. 2. Provide shaded riverine aquatic cover and habitat enhancement along 5,000 ft of channel.
Capital Cost Estimate	\$11,760,000
Implementation Issues	• Permitting, including Clean Water Act Section 401/404. • Coordinate bank stabilization improvements with potential City of Dublin improvements for a linear city park along this reach. • Channel lining will result in unmitigable wetland loss.
Project Precursors	• Hydraulic modeling to determine maximum roughness coefficient allowable for channel capacity and the amount of planting on channel slopes and banks. • Geomorphologic analysis. • Develop Vegetation Management Plan.
Project Benefits	• Reduces high velocity in S. San Ramon Creek. • Controls erosion in Alamo Canal through bank stabilization measures. • Provides aesthetic improvements along channel through increased vegetation.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: A, B, C Water Supply: none Water Quality: C Habitat & Environment: C Recreation, Trails, and Public Education: none
Maintenance Activities	Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Vegetation Maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on hand removal of riparian vegetation. • Collect and dispose of vegetation debris.
Annual Maintenance Cost Estimate	\$436,000
Notes	• South San Ramon Creek is currently eroding and contributing to downstream aggradation in Alamo Canal. • This project utilizes bio-technical and geo-technical bank stabilization. Alternate bank stability methods such as cutting back the slope may be required if hydraulic modeling indicates that required capacity will not allow increased vegetation on channel banks. Space constraints could be an issue that needs to be analyzed if slope cut-backs were to be used. • The City of Dublin is considering acquiring land along the east side of South San Ramon Creek owned by Alameda County and Union Pacific Railroad for a linear city park.
References	Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001



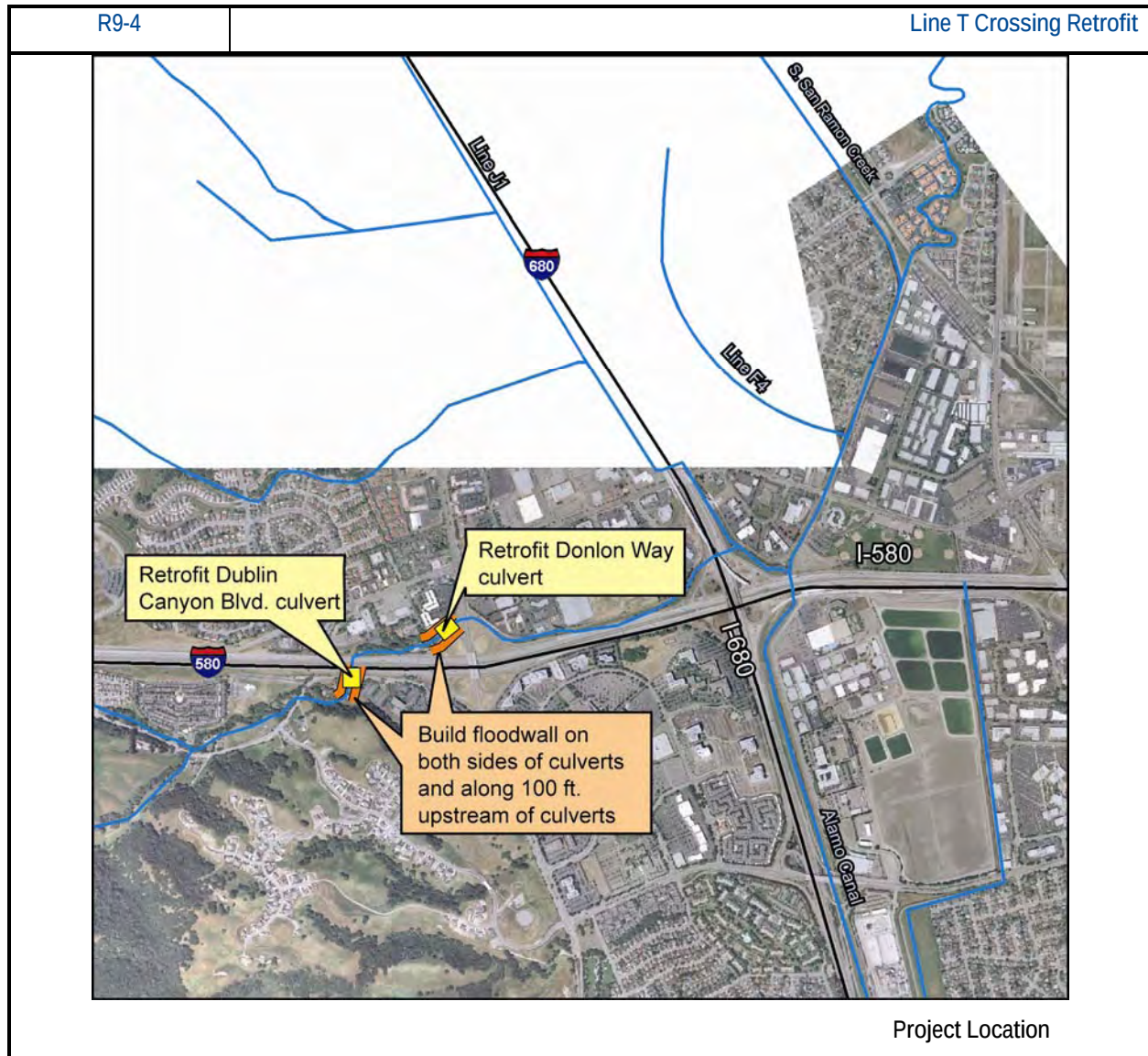
Project Number	R9-2
Project Name	Line F-4 Concrete Lining
Project Location	Line F-4 (STA 50+00 to 0+00)
Purpose	Stabilize banks which are currently backing adjacent residences' backyards and arrest further property loss.
Project Components	1. Concrete line 5,000 feet of channel banks. Project includes creation of 3.7 acres of wetlands as environmental mitigation for concrete lining.
Capital Cost Estimate	\$1,250,000
Implementation Issues	• Permitting, especially Clean Water Act Section 401/404 • Coordination with RWQCB, CDFG, City of Dublin. • Channel lining will result in unmitigable wetland loss.
Project Precursors	• Hydrologic/hydraulic modeling.
Project Benefits	• Reduces maintenance needs and costs. • Stabilizes stream banks.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: A Water Supply: none Water Quality: none Habitat & Environment: none Recreation, Trails, and Public Education: none
Maintenance Activities	Wetlands Maintenance (mitigation): • Conduct annual visual estimates of vegetative cover and species composition to estimate vegetative cover, species diversity, presence or absence of target and invasive species, and general abundance of individual plant species. Identify species survival rate. • Replace wetland vegetation, as needed, to maintain at least 50% surface area coverage after second growing season. • Conduct hand weeding of exotic plant species during the first three years to ensure there is no interference with the development and establishment of target wetland plant species. • Conduct annual routine maintenance activities including access road maintenance, and debris removal.
Annual Maintenance Cost Estimate	\$74,000
Notes	There was concern about concrete lining projects expressed during stakeholder workshops. However, right-of-way restrictions limit ability to implement other solutions.
References	Personal communication with Joe Seto, Zone 7 Water Agency, 2003



Project Number	R9-3
Project Name	Line J-1, J-3 and J-5 Improvements
Project Location	Line J-1 from Alamo Canal to station 55+00 in the City of Dublin
Purpose	The area adjacent to Line J-1 is prone to flooding during large flood events. The purpose of this project is to increase the channel capacity by decreasing the roughness coefficient of the channel. In addition, the project addresses three undersized culverts at Amador Valley Boulevard, Dublin Boulevard, and I-680.
Project Components	1. Increase channel capacity by concrete lining 2,100' of channel banks along Line J-1 (STA 56+00 to 35+00) to decrease channel roughness. Project includes creation of 1.9 acres of wetlands as environmental mitigation for concrete lining. 2. Retrofit culverts at San Ramon Road (2), Amador Valley Boulevard (1), I-680 (1), and Dublin Boulevard (1) to create additional freeboard by raising the bridge wall and excavating another box to create an additional flow path.
Capital Cost Estimate	\$8,700,000
Implementation Issues	• Permitting, Clean Water Act Section 401/404. • Coordination with RWQCB, CDFG, City of Dublin. • Channel lining will result in unmitigable wetland loss.
Project Precursors	Hydrologic/hydraulic modeling
Project Benefits	• Reduce current 100-year flooding • Reduce maintenance requirements • Protect infrastructure
Goals/Objectives Addressed	Flood Protection & Drainage: B Erosion and Sedimentation: A Water Supply: none Water Quality: none Habitat & Environment: none Recreation, Trails, and Public Education: none
Maintenance Activities	Culvert Maintenance: • Perform annual inspection. • Collect and dispose of vegetation debris. Wetlands Maintenance (mitigation): • Conduct annual visual estimates of vegetative cover and species composition to estimate vegetative cover, species diversity, presence or absence of target and invasive species, and general abundance of individual plant species. Identify species survival rate. • Replace wetland vegetation, as needed, to maintain at least 50% surface area coverage after second growing season. • Conduct hand weeding of exotic plant species during the first three years to ensure there is no interference with the development and establishment of target wetland plant species. • Conduct annual routine maintenance activities including access road maintenance, and debris removal.
Annual Maintenance Cost Estimate	\$3,000
Notes	There was concern about concrete lining expressed during stakeholder workshops, however there are space constraints that prevent the expansion of the existing channel.
References	Personal communication with Zone 7 Staff, Spring 2005



Project Number	R9-4
Project Name	Line T Crossing Retrofit
Project Location	Line T at Dublin Canyon Boulevard and Donlon Way.
Purpose	Protect adjacent properties from flooding by increasing culvert sizes.
Project Components	1. Retrofit Dublin Canyon Boulevard culvert by: • Increasing the culvert capacity. • Constructing 100 feet long, 3 feet high floodwalls on both banks upstream of culvert. • Constructing 50 feet long, 1 feet high floodwall on each side of bridge. 2. Retrofit Donlon Way culvert by: • Increasing the culvert capacity. • Constructing 100 feet long, 3 feet high floodwalls on both banks upstream of culvert. • Constructing 50 feet long, 1 feet high floodwall on each side of bridge.
Capital Cost Estimate	\$3,040,000
Implementation Issues	• Coordination with Caltrans and the City of Dublin regarding runoff from Schaefer Heights.
Project Precursors	• Hydraulic modeling to determine the capacity of the crossings and the needed culvert size.
Benefits	• Reduce local flooding
Goals/Objectives Addressed	Flood Protection & Drainage: A, B, E Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: none Recreation, Trails, and Public Education: none
Maintenance Activities	Culvert Maintenance: • Perform annual inspection. • Collect and dispose of vegetation debris.
Annual Maintenance Cost Estimate	\$0
Notes	• The Dublin Canyon Road bridge and the Donlon Way crossing are currently under capacity to convey 100-year flood flows. • The modified culvert at Dublin Canyon Boulevard will be designed to accommodate flows from the Schaefer Heights approved by the City of Dublin in 1998, but not yet constructed.
References	Personal communication with and comment on West Yost & Associates TM #5 from Joe Seto, Zone 7 Water Agency, 2003



Project Number	R9-5
Project Name	I-580 Trail Gap Elimination
Project Location	Alamo Canal at I-580 near Dublin Library
Purpose	Close existing trail gap at I-580 crossing and link trails south and north of I-580.
Project Components	- Construct trail connection by: - Excavating notch on east side of bridge between freeway overpass pilings. - Installing 370 feet of 10 feet high retaining wall. - Building 370 feet of trail surface under I-580 bridge.
Capital Cost Estimate	\$860,000
Implementation Issues	- Coordination with Caltrans, BART, Cities of Dublin and Pleasanton, EBRPD, and Alameda County Transportation Authority. - Coordination with the Dublin and Pleasanton police departments with regards to safety measures.
Project Precursors	Geotechnical evaluation of slope stability.
Project Benefits	Regional connectivity.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: none Recreation, Trails, and Public Education: C, D, G
Maintenance Activities	Maintenance of trails: - Conduct annual inspection of trails. - Seal cracks and repair pavement on trails, as needed. - Clear debris and vegetation growth, as needed. - Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$3,000
Notes	- The crossing at I-580 represents a current gap in the trail systems. The project goal is to create a system of regional trails by providing connectivity between existing trails. - Zone 7 will provide trail use by way of their maintenance road. - Various options for location and stabilization have been evaluated in previous reports. This project has been proposed and accepted in the past but was not completed due to funding issues.
References	- Bissell & Karn, Inc., Alamo Canal Access Road Alternative Analysis, 1992 - Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 - Personal communication with Jim Townsend, EBRPD, 2003 - Personal communication with Brian Swift, City of Pleasanton, 2003

R9-5

I-580 Trail Gap Elimination

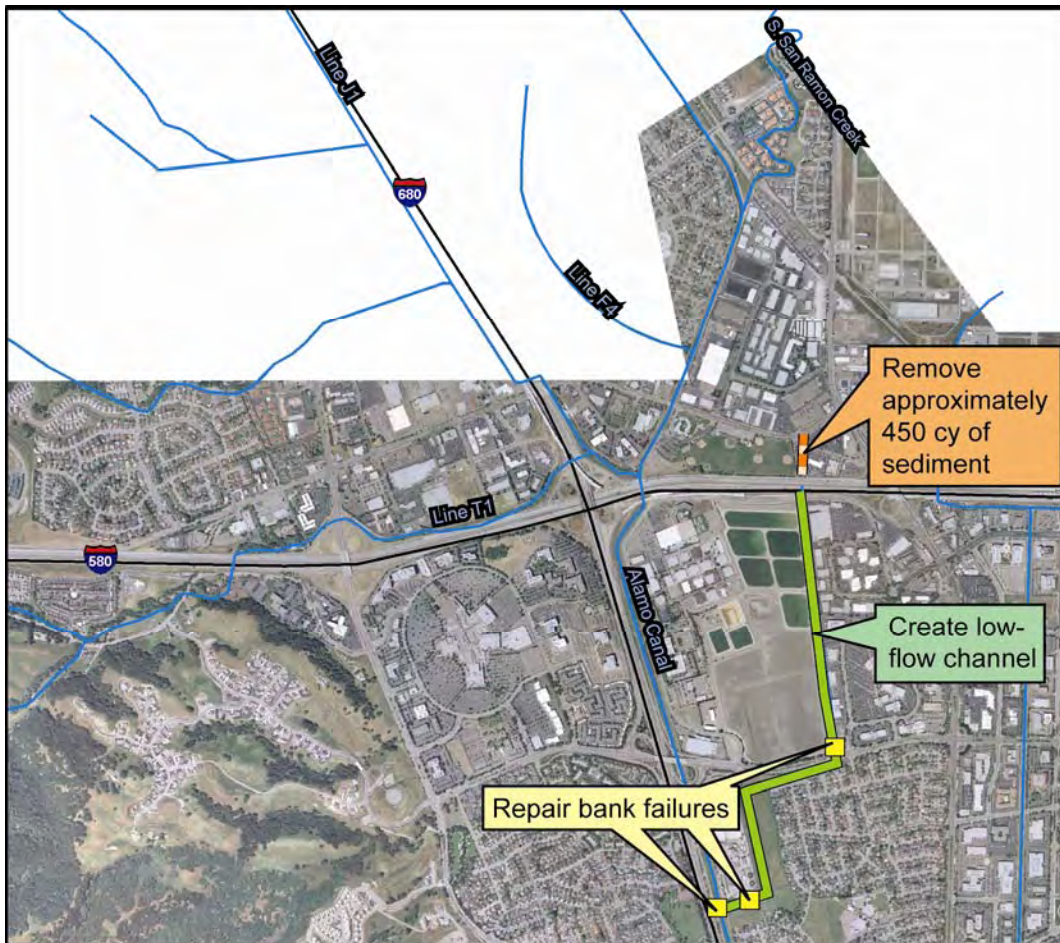


Project Location and Schematic

Project Number	R9-6
Project Name	Line G-1-1 Maintenance Plan
Project Location	Line G-1-1 from its confluence with Alamo Canal to I-580 (STA 80+00 to 0+00)
Purpose	Eliminate mosquito breeding in stagnant pools by creating a low flow channel. Repair minor bank failures along the stream.
Project Components	1. One time sediment removal of approximately 450 CY from the I-580 to the Dublin Boulevard crossings (along approximately 780 feet of channel). Project includes creation of 0.3 acres of wetlands as environmental mitigation for sediment removal. 2. Create low flow channel along 8,000-feet of channel from I-580 to confluence with Alamo Canal (assuming a meandering ratio of 1.25). 3. Repair minor bank failures in three locations (STA 43+00; 5+00; and at junction with Alamo Canal).
Capital Cost Estimate	\$2,150,000
Implementation Issues	• Permitting, especially Clean Water Act Section 401/404. • Coordination with local mosquito control and abatement districts. • Project location provides habitat for western pond turtle. Construction of the low flow-channel will be implemented to minimize impacts on the pond turtle habitat. • It is noted that pools associated with mosquito proliferation can provide species habitat (i.e. western pond turtle). Mosquito abatement will need to be planned carefully to avoid special-status species impacts. In particular, the timing of pond draining would need to be evaluated.
Project Precursors	Develop Vegetation Management Plan.
Project Benefits	• Reduces mosquitoes and other pests. • Reduces downstream sedimentation.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: A Water Supply: none Water Quality: C Habitat & Environment: B Recreation, Trails, and Public Education: none
Maintenance Activities	Maintenance of bank repairs: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed.
Annual Maintenance Cost Estimate	\$5,000
Notes	• Channel invert elevation is below groundwater level at some sections of Line G-1-1. This results in stagnant pools which attract mosquitoes and other insects. Excavation of the low flow channel will concentrate the flow and provide better drainage. • Line G-1-1 has little impact on other parts of system.
References	• Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 • Personal communication with Joe Seto, Zone 7 Water Agency, 2003

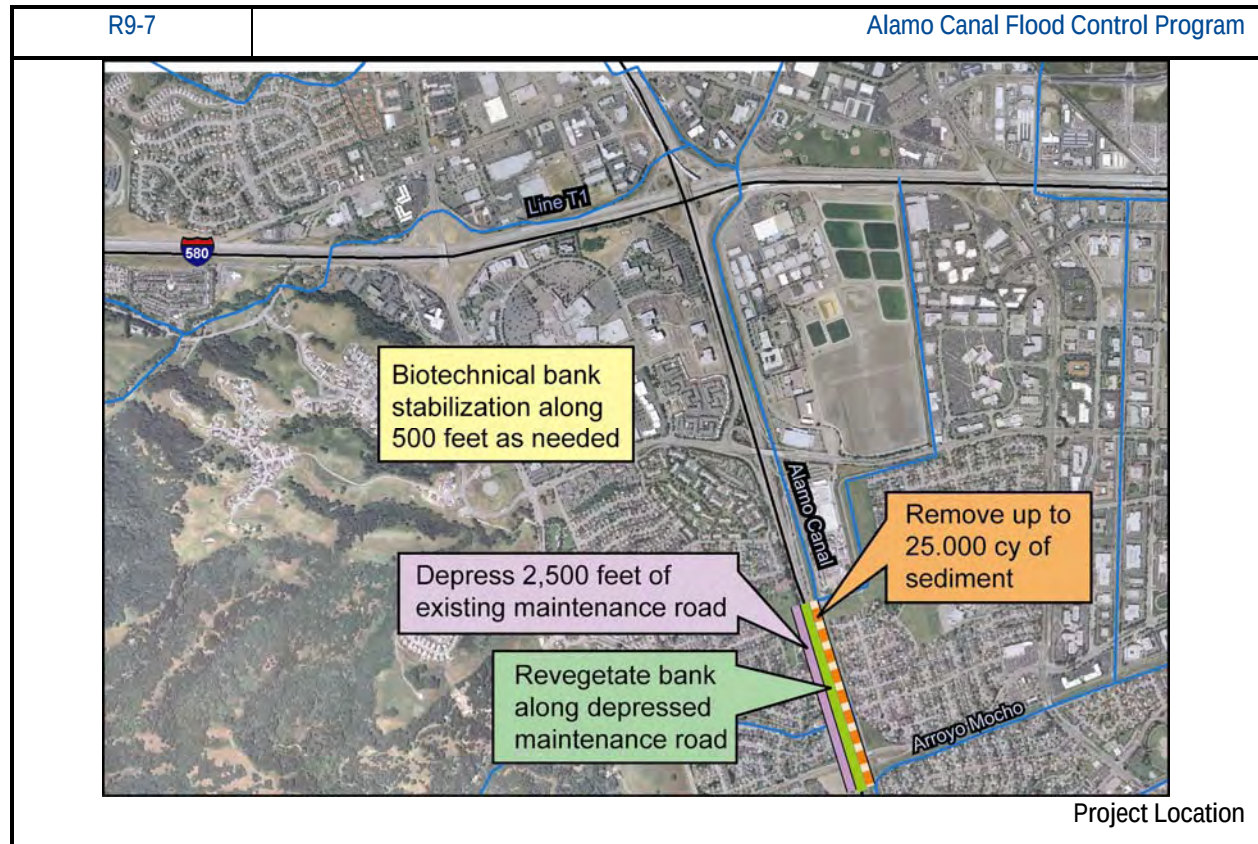
R9-6

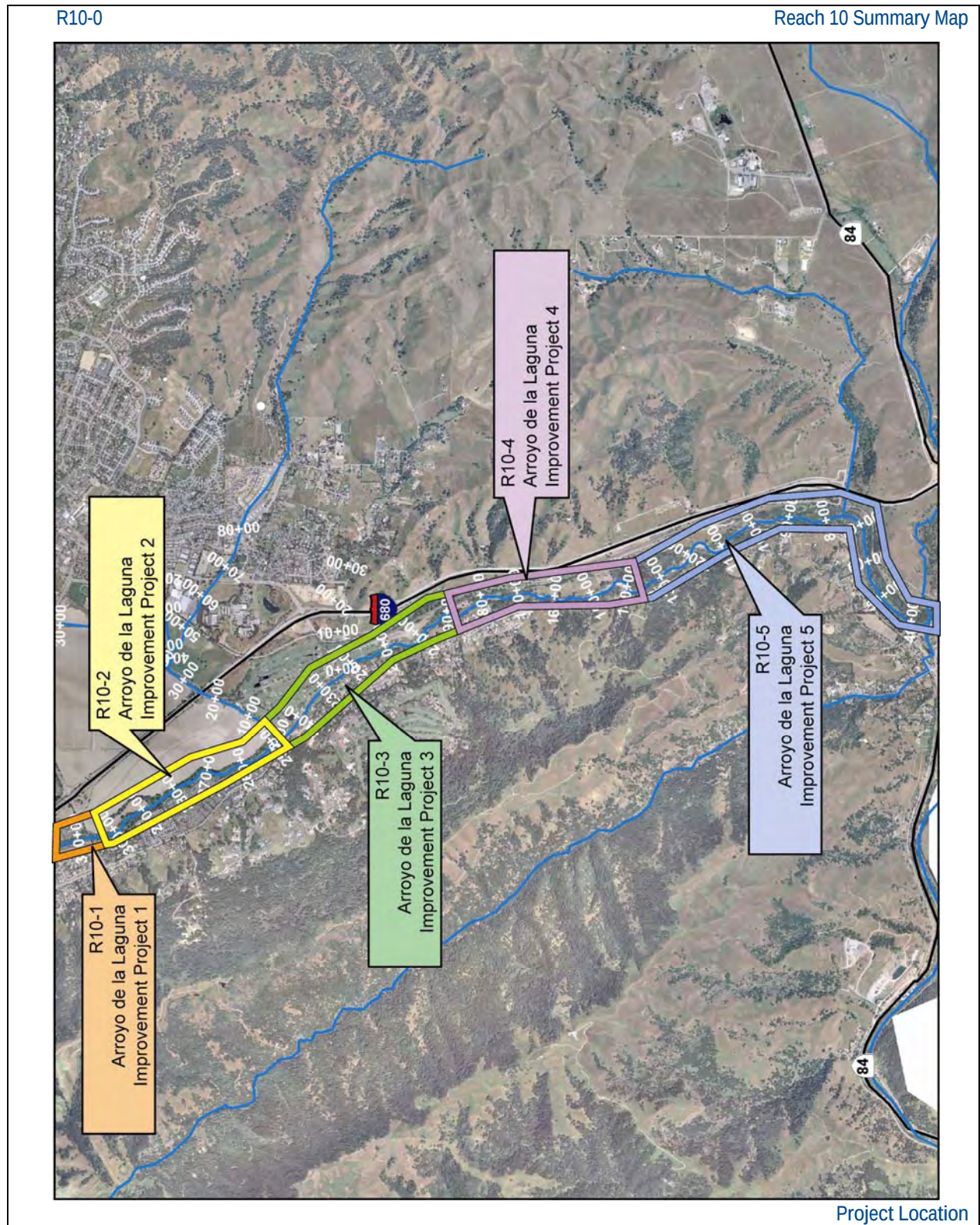
Line G-1-1 Maintenance Plan



Project Location

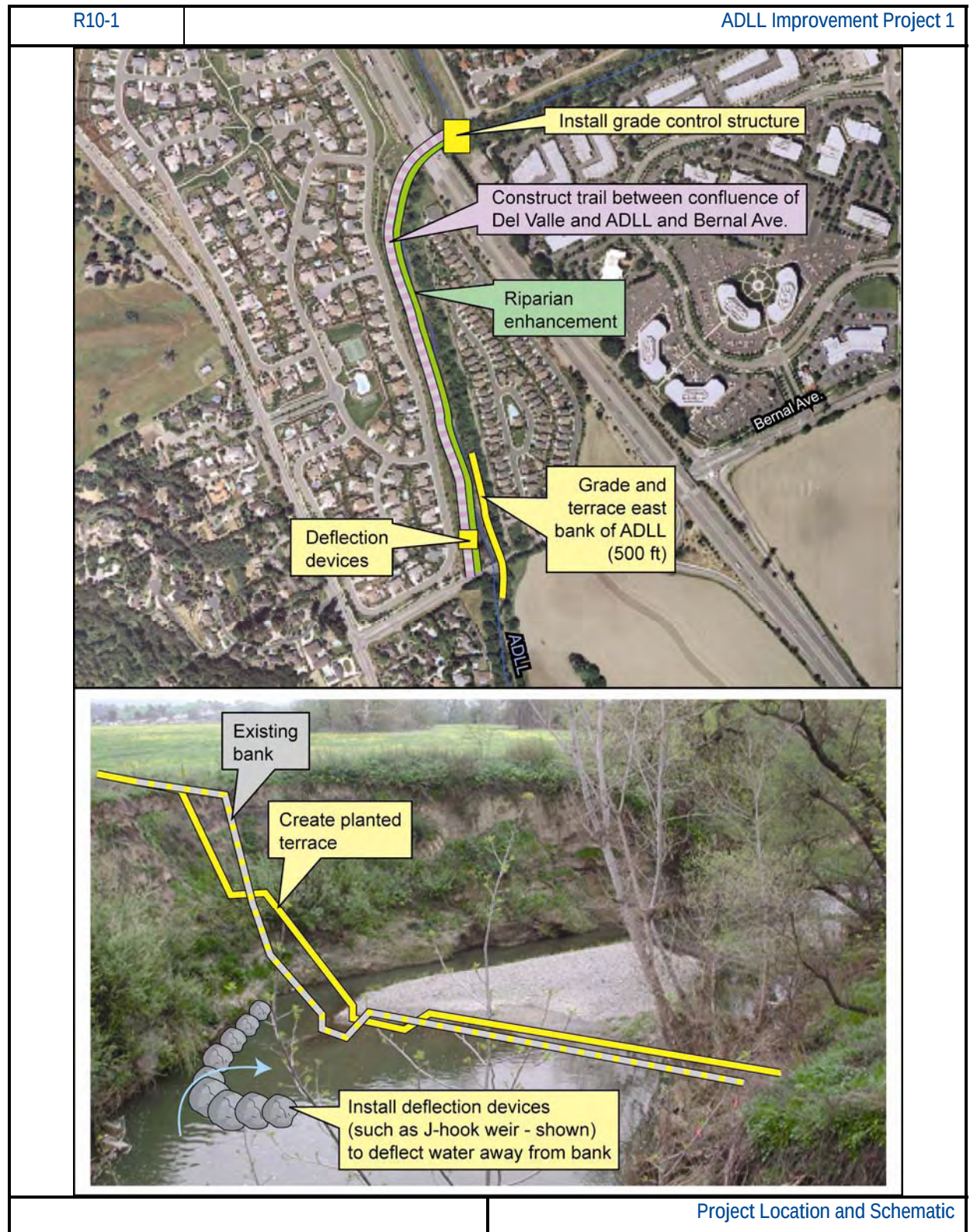
Project Number	R9-7
Project Name	Alamo Canal Flood Control Program
Project Location	Alamo Canal from Arroyo Mocho to I-580 (90+00 to 25+00)
Purpose	Restore capacity by conducting one-time sediment removal and lowering an existing maintenance road.
Project Components	1. One-time sediment removal of up to 25,000 CY of sediment to increase hydraulic capacity. Project includes creation of 7.8 acres of wetlands as environmental mitigation for sediment removal. 2. Depress 2,500 ft of maintenance road to increase capacity. 3. Construct bio-technical bank stabilization along approximately 500 feet. 4. Conduct re-vegetation along 2,500 feet of excavated bank (2.3 acres)
Capital Cost Estimate	\$10,860,000
Implementation Issues	• Coordination with regulatory agencies. • Permitting related to sediment issues and Clean Water Act Section 401/404.
Project Precursors	• Hydraulic and geomorphologic modeling. • Develop Sediment Management Plan.
Project Benefits	• Reduces local flooding. • Restores stream conveyance capacity.
Goals/Objectives Addressed	Flood Protection & Drainage: A, B, E Erosion and Sedimentation: A Water Supply: none Water Quality: C Habitat & Environment: E Recreation, Trails, and Public Education: none
Maintenance Activities	Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Vegetation maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on chemical clearing of invasive species which includes conducting a biological survey and implementing a water quality sampling plan. • Collect and dispose of vegetation debris.
Annual Maintenance Cost Estimate	\$67,000
Notes	• Alamo Canal is aggradating due to excess sediment input from South San Ramon Creek and the reaches of Alamo Canal upstream of I-580. As a result, Alamo Canal does not have sufficient capacity to convey the 100-year flood flows. • Project will be phased due to habitat concerns. • Hydraulic modeling will identify the impacts of channel increased capacity and its effect on velocity. If the modeling identifies high velocity, velocity issues will be addressed during the design phase.
References	Personal Communication with Zone 7 Staff, Zone 7 Water Agency, 2005





Project Number	R10-1
Project Name	ADLL Improvement Project 1
Project Location	ADLL from the confluence of Arroyo del Valle to just downstream of Bernal Bridge adjacent to Foothill Place (between STA 330+00 and 300+00).
Purpose	The purpose of this project is to stabilize the banks along the upper reach of ADLL, enhance the riparian corridor, and create a recreational corridor along the stream.
Project Components	1. Upgrade 2,500 ft of maintenance road from the existing maintenance road on west bank of ADLL and proposed bridge at Arroyo del Valle/ADLL confluence to Bernal Avenue (STA 330+00 to 305+00). Project includes installation of signage and traffic signal. 2. Stabilize channel by installing one grade control structure such as a vortex rock weir downstream of the I-680 undercrossing apron. 3. Conduct bank stabilization, including: • Construct five in-stream bank protection devices, such as J-hooks. • Stabilize using bio-technical measures 500 feet on the east bank of ADLL downstream of Bernal Avenue bridge. Stabilization includes a vegetated bank terrace. 4. Enhance 6.9 acres of vegetation along 3,000 feet of riparian corridor on each bank. Fill riparian gaps with trees, shrubs, and live stakings.
Capital Cost Estimate	\$7,490,000
Implementation Issues	• Coordination with the City of Pleasanton. • Permitting in compliance with CWA Section 401/404. • Right-of-way restrictions - residences and others
Project Precursors	Conduct a geomorphic study of the reach (Reach 10).
Project Benefits	• Addresses bank down-cutting downstream of Bernal bridge. • Eliminates existing trail gap and provides a link to section along ADLL south of Bernal Avenue. • Enhances riparian corridor habitat.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: A Water Supply: none Water Quality: C, E Habitat & Environment: B, C Recreation, Trails, and Public Education: D, G
Maintenance Activities	Maintenance of trails: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed. Maintenance of channel stabilization measures: • Conduct annual inspection of site. • Conduct repairs of channel stabilization measures, as needed. Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Vegetation maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on hand removal of invasive

	species. • Collect and dispose of vegetation debris.
Annual Maintenance Cost Estimate	\$118,000
Notes	Portions of ADLL are subject to sediment deposition and dramatic bank erosion. However, ADLL remains the most natural stream of the watershed with significant opportunities to stabilize the stream while maintaining and enhancing its habitat.
References	Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001



Project Number	R10-2
Project Name	ADLL Improvement Project 2
Project Location	ADLL from just downstream of Bernal Avenue to Lines B21 (STA 305+00 to 248+00).
Purpose	Enhance stream habitat and environmental features for steelhead, stabilize banks, and create recreational corridor along ADLL.
Project Components	1. Replace the existing concrete storm water drainage outfall near Beaumont Court, downstream of Bernal Avenue with a new drain structure designed to prevent downstream erosion. 2. Remove the existing concrete structure located at the confluence of Line B21 and ADLL. Replace it with a drop structure, concrete apron and riprap to act as an energy dissipation unit. 3. Stabilize banks, including: • 100 feet of bank opposite of Line B21 by utilizing bio-technical bank stabilization techniques, such as a log crib wall. • 100 feet on east bank of ADLL in the vicinity of confluence structure. Stabilization will include a vegetated bank terrace. Project includes acquisition of 0.2 acres along 200 feet of bank for bank stabilization implementation. 4. Recreational features include: • One mile of multi-purpose trail along Bernal property running on the east bank of the ADLL. • Pedestrian bridge over Line B21 at confluence with ADLL to Castlewood Golf Course. • Interpretive kiosk at confluence of line B21 and ADLL. • Acquisition of 2.4 acres along one mile of stream for trail.
Capital Cost Estimate	\$4,400,000
Implementation Issues	• Coordination with the City of Pleasanton • Property acquisition issues • Coordination with individual property owners for trail use along private properties. • Coordination with Alameda County for work adjacent to the county Foothill Road stabilization project. • Permitting in compliance with CWA Section 401/404. • Trail/bank stability analysis.
Project Precursors	Conduct a geomorphic study of the reach (Reach 10).
Project Benefits	• Reduces in-stream bank instability. • Addresses bank erosion and stability. • Links ADLL to trail network (trail north of Bernal Avenue and Iron Horse Trail). • Potential fisheries stream corridor.
Goals/Objectives Addressed	Flood Protection & Drainage: A, D Erosion and Sedimentation: A Water Supply: none Water Quality: C, E Habitat & Environment: B, C, Recreation, Trails, and Public Education: B, D, G
Maintenance Activities	Maintenance of replaced outfalls: • Conduct annual inspection of site. • Conduct repairs of structures, as needed. Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Maintenance of trails: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed.

	• Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$57,000
Notes	-
References	Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001

R10-2

ADLL Improvement Project 2



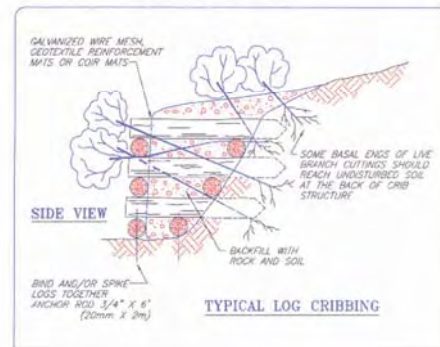
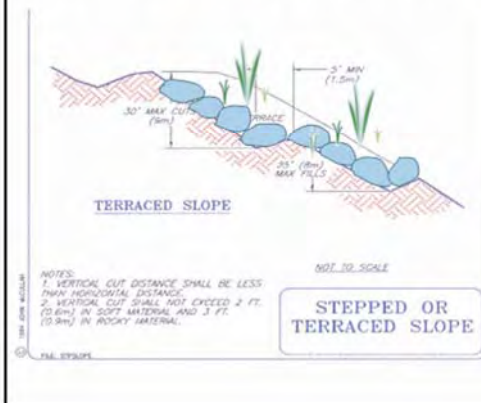
Project Location

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ADLL Improvement Project 2

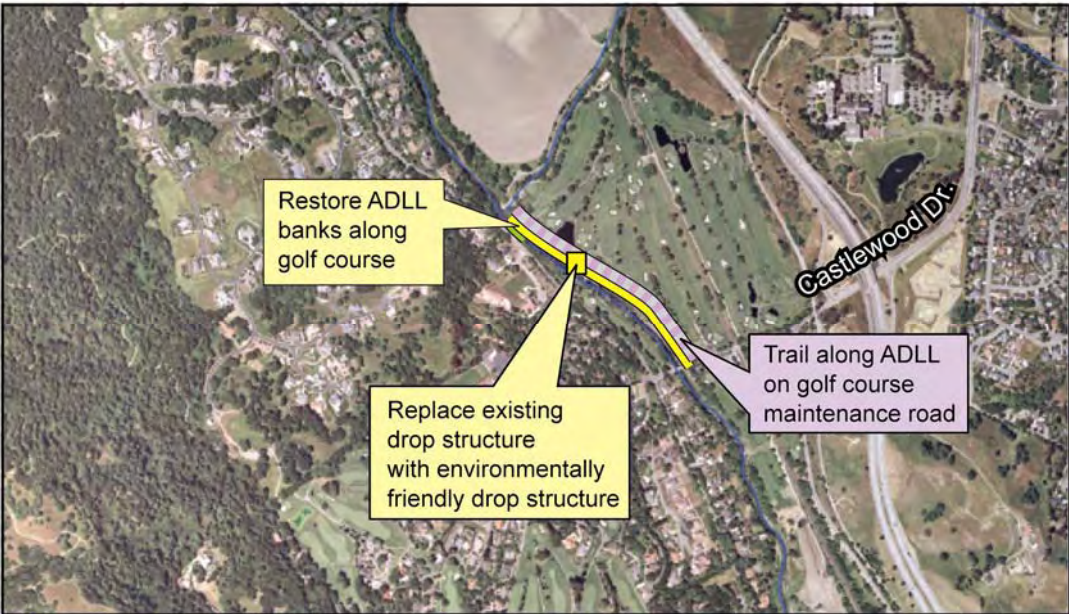


Confluence of Line B21 and ADLL

ADLL west bank, opposite of confluence
Line B21 and ADLL

Project Location and Schematic

Project Number	R10-3
Project Name	ADLL Improvement Project 3
Project Location	ADLL, along Castlewood Golf Course (STA 248+00 to 211+00) from Line B21 to Castlewood Drive.
Purpose	Improve potential fisheries corridor in ADLL and stabilize banks. Extend recreational corridor.
Project Components	1. Replace existing drop structure (fish barrier) just upstream of Castlewood Drive footbridge, with a fish-passable drop structure such as a vortex rock weir. 2. Modify golf course installed rip-rap at Castlewood Drive by: • Restoring rip-rap on the lower bank sections of both banks (STA 246+00 to 222+00), as needed for 2,400 feet. • Removing rip-rap on the upper sections of both banks and plant live staking on the upper bank sections (STA 222+00 to 246+00), as needed for 2,400 feet. The project includes acquisition of 5.5 acres along 2,400 feet on each bank. 3. Coordinate with golf course to open the maintenance road between ADLL and golf course for public access between line B21 and Castlewood Drive (2,400 feet). Project includes acquisition of 1.1 acres along 2,400 feet for trail.
Capital Cost Estimate	\$7,950,000
Implementation Issues	• Coordination with golf course owner to implement bank stabilization and public access. • Permitting in compliance with CWA Section 401/404. • Coordination with private landowners.
Project Precursors	Conduct a geomorphic study of the reach (Reach 10).
Project Benefits	• Restores vegetation to an area within ADLL that contains a large portion of hardscape. • Improves potential steelhead corridor by providing fish passable in-stream structures. • Extends trail network along ADLL.
Goals/Objectives Addressed	Flood Protection & Drainage: A, D Erosion and Sedimentation: A Water Supply: none Water Quality: C Habitat & Environment: B, C Recreation, Trails, and Public Education: C, D, E
Maintenance Activities	Maintenance of replaced drop structure: • Conduct annual inspection of site. • Conduct repairs to structure, as needed. Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Maintenance of trails: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$258,000
Notes	-
References	Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001

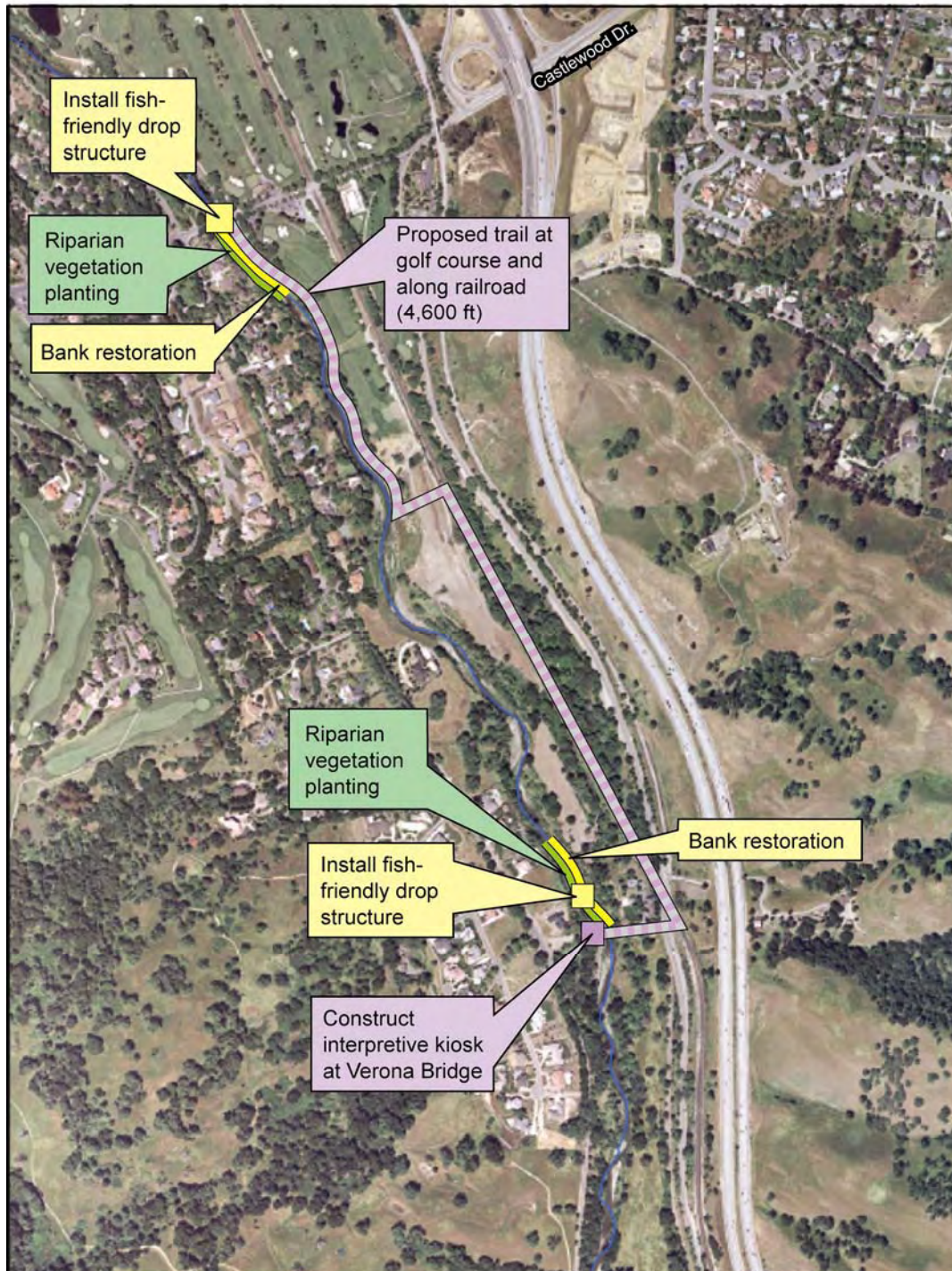
R10-3	ADLL Improvement Project 3
  Drop structure upstream of Castlewood Drive Rip-rap along Castlewood Country Club	
	Project Location and Schematic

Project Number	R10-4
Project Name	ADLL Improvement Project 4
Project Location	ADLL from Castlewood Drive to Verona Road (STA 226+00 to 179+00)
Purpose	The purpose of this project is to stabilize the bed and banks along the middle reach of ADLL, enhance the riparian corridor, and continue the recreational corridor along the stream.
Project Components	1. Bank Stabilization: • Conduct bank restoration activities at two locations along ADLL's west bank: south of Castlewood Drive (STA 226+00) and just north of Verona bridge (STA 179+00). Activities will include creation of planted terrace along approximately 500 feet at 2 locations. • Riparian vegetation: Plant 1.1 acres of vegetation along 1,000 feet of bank (500 feet in 2 locations). • Acquire 1.15 acres of land for stabilization activities. 2. Channel Stabilization: • Stabilize channel bed by constructing at two locations two fish-passable grade control structures, such as rock vanes; one at the Castlewood Bridge crossing (STA 225+00), and one at the Verona Bridge crossing (STA 185+00). 3. Recreation: • Extend trail south of golf course along ADLL, and along abandoned railroad (4,600 feet from STA 225+00 to 179+00). • Install signage at Castlewood Drive for pedestrian crossing. • Construct interpretive kiosk at Verona Bridge. • Acquire 2.1 acres (assuming 4,600 feet x 20 feet) of railroad easement to build trail along railroad.
Capital Cost Estimate	\$5,280,000
Implementation Issues	• Coordination with Natural Resource Conservation Service (NRCS) on bank stability demonstration project. • Coordination with East Bay Regional Park District (EBPRD) and Union Pacific Railroad. • Coordination with individual property owners. • Permitting in compliance with CWA Section 401/404.
Project Precursors	Conduct a geomorphic study of the reach (Reach 10).
Benefits	• Protects homes from loss of property. • Extends trail system along ADLL. • Addresses bank erosion along ADLL.
Goals/Objectives Addressed	Flood Protection & Drainage: A Erosion and Sedimentation: A, B Water Supply: none Water Quality: C, E Habitat & Environment: B, C Recreation, Trails, and Public Education: B, C, D
Maintenance Activities	Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Maintenance of trails: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed. Vegetation maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of

	methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on hand clearing of invasive species. • Collect and dispose of vegetation debris.
Annual Maintenance Cost Estimate	\$106,000
Notes	Portions of ADLL are subject to sediment deposition and dramatic bank erosion. However, ADLL remains the most natural stream of the watershed with significant opportunities to stabilize the stream while maintaining and enhancing its habitat.
References	Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001

R10-4

ADLL Improvement Project 4



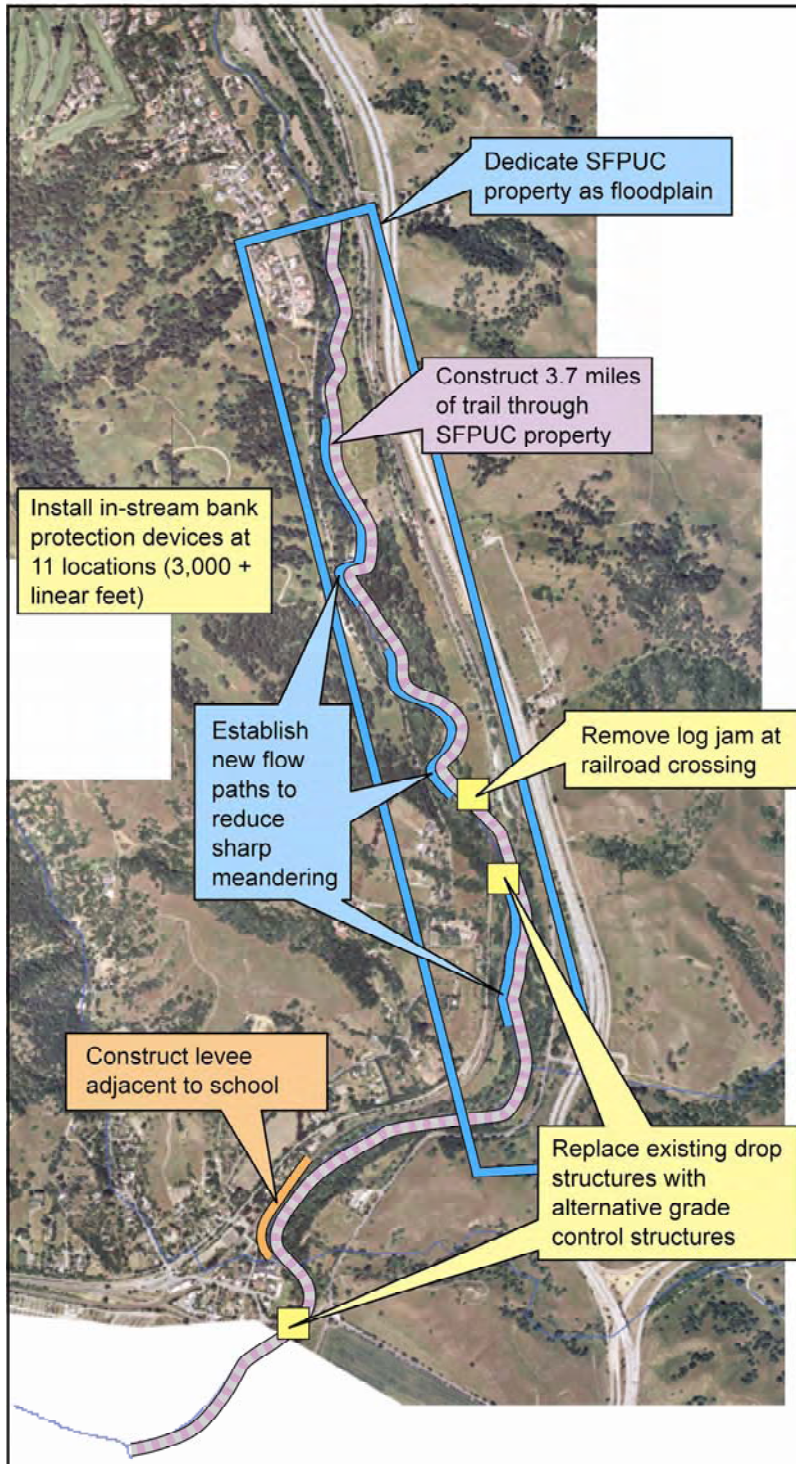
Project Location

Project Number	R10-5
Project Name	ADLL Improvement Project 5
Project Location	Lower section of Arroyo de la Laguna, south of Verona Bridge to the Alameda Creek confluence (STA 180+00 to 0+00)
Purpose	Protect properties from flooding during 100-year flood event at build-out conditions. Reduce erosion and improve riparian habitat using bioengineered stabilization approaches. Continue recreational corridor along lower reaches of ADLL.
Project Components	1. Preserve existing floodplain on SFPUC property. 2. Create 3.7 miles of trail along ADLL between Verona Bridge and Niles Canyon. The project includes acquisition of 4.8 acres for trail. 3. Remove 2 fish barriers by replacing the existing drop structures at Paloma Way and railroad crossing with two alternative grade control structures such as a vortex rock weir. 4. Remove log jam from railroad crossing structure (STA 110+00). 5. Stabilize channel banks by: • Installing in-stream bank protection devices at 11 locations along project reach such as vegetated rock, log-crib walls, or root wads. Total length of bank protection is 3,000 feet (costs are based on log-cribwall design). • Reducing sharp meander at 3 locations by establishing new flow paths. The project includes acquisition of 6.9 acres. • Use bioengineered stabilization techniques such as rootwad construction, J-hook weirs, and log cribwalls with rootwad cross-pieces along 3,000 feet of channel. Use existing sediment and downed trees as part of stabilization materials. • Install upstream and downstream grade control structures such as rock vanes to control nick-point migration and to prevent damage to the restored bend section until plantings can establish themselves. Estimated number is 6 structures. 6. Conduct vegetation management by: • Implementing non-native species control along 9,000 feet on each bank. The project includes acquisition of 13.8 acres to implement vegetation management activities including enhancement of water quality and habitat value by eliminating grazing/cattle access (0.5 miles). • Planting 1.1 acres of native species for stabilization along 1,000 feet of levee. 7. Build levee along the west bank of the channel. The levee will extend along 1,000 feet of channel immediately upstream of the Niles Canyon Road Bridge.
Capital Cost Estimate	\$29,230,000
Implementation Issues	• Coordination with SFPUC, ACPWA and NRCS to protect floodplain. • Coordination with EBRPD and Pacific Railroad. • Permitting in compliance with CWA Section 401/404.
Project Precursors	Conduct a geomorphology study of the reach.
Project Benefits	• Improves potential steelhead corridor. • Creates recreational corridor along ADLL. • Reduces future flooding to properties along downstream section of ADLL. • Addresses stability of ADLL.
Goals/Objectives Addressed	Flood Protection & Drainage: A, B, C Erosion and Sedimentation: A, B Water Supply: none Water Quality: C, E Habitat & Environment: B, C Recreation, Trails, and Public Education: C, D
Maintenance Activities	Maintenance of trails:

	• Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed. Maintenance of replaced drop structure: • Conduct annual inspection of site. • Conduct repairs to structure, as needed. Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Vegetation maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on hand clearing of invasive species. • Collect and dispose of vegetation debris. Maintenance of levee: • Conduct annual inspection of site. • Conduct repairs of levee, as needed.
Annual Maintenance Cost Estimate	\$1,049,000
Notes	Monitor for channel stabilization annually.
References	• Flood Control MP, TM No. 5: Evaluation of Problem Areas & Identification of Solutions, West Yost & Associates, November 2001 • Arroyo de la Laguna Streambank Restoration (SFPUC), 2004 • Interdisciplinary Site Report (NRCS), 2004

R10-5

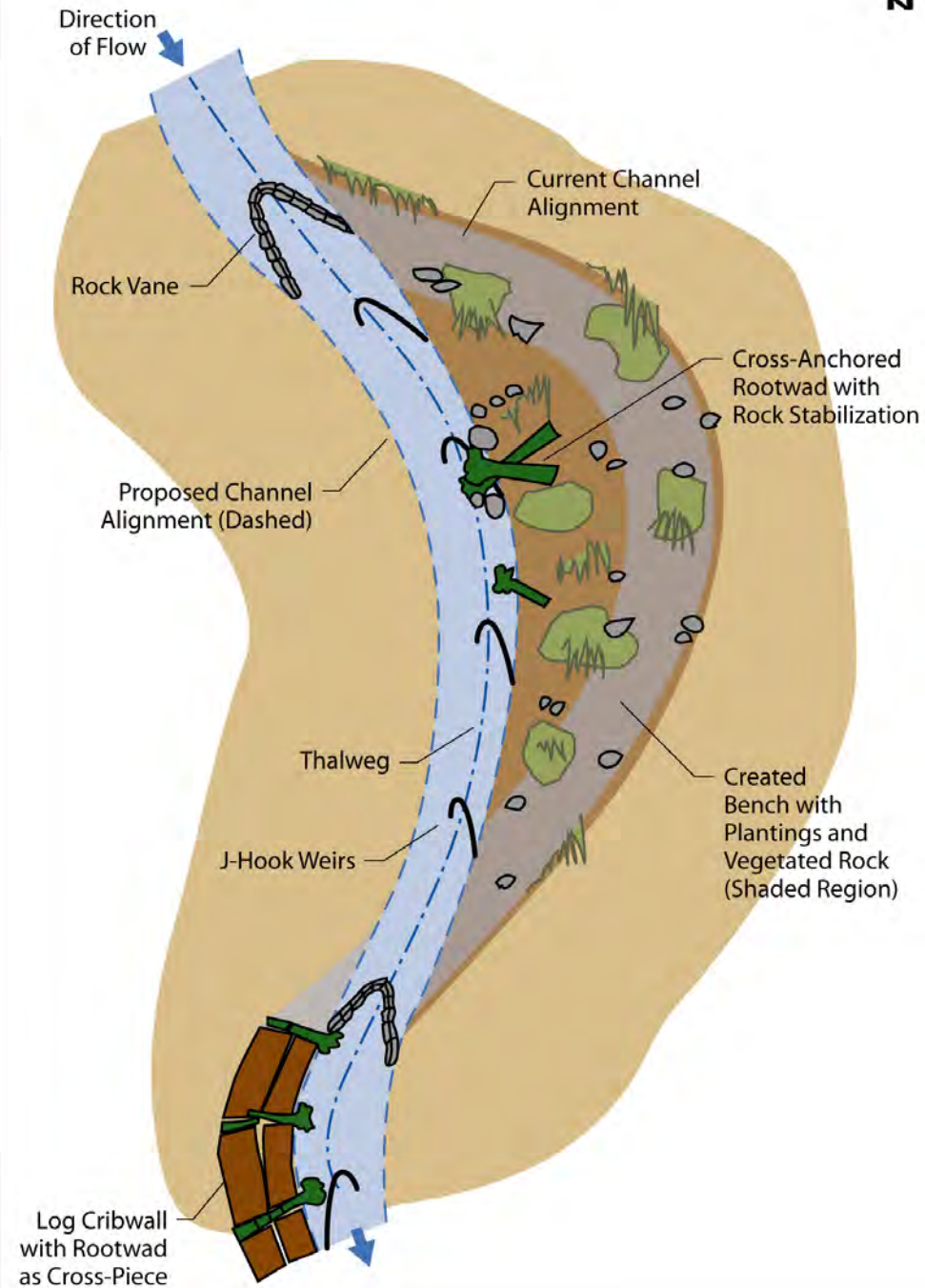
ADLL Improvement Project 5



Project Location

R10-5

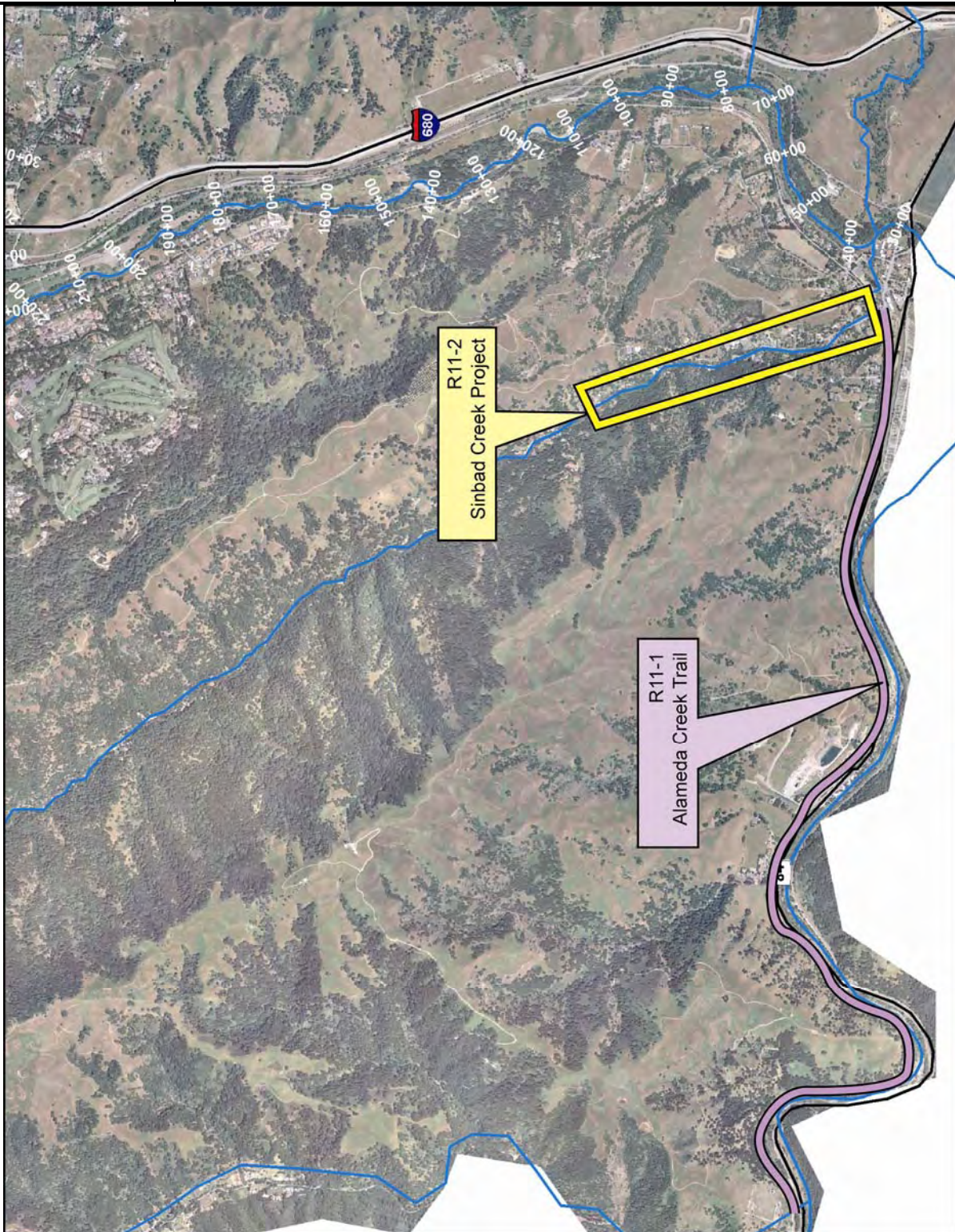
ADLL Improvement Project 5

**Arroyo de la Laguna: Sharp Meander Reduction
and Streambank Protection**

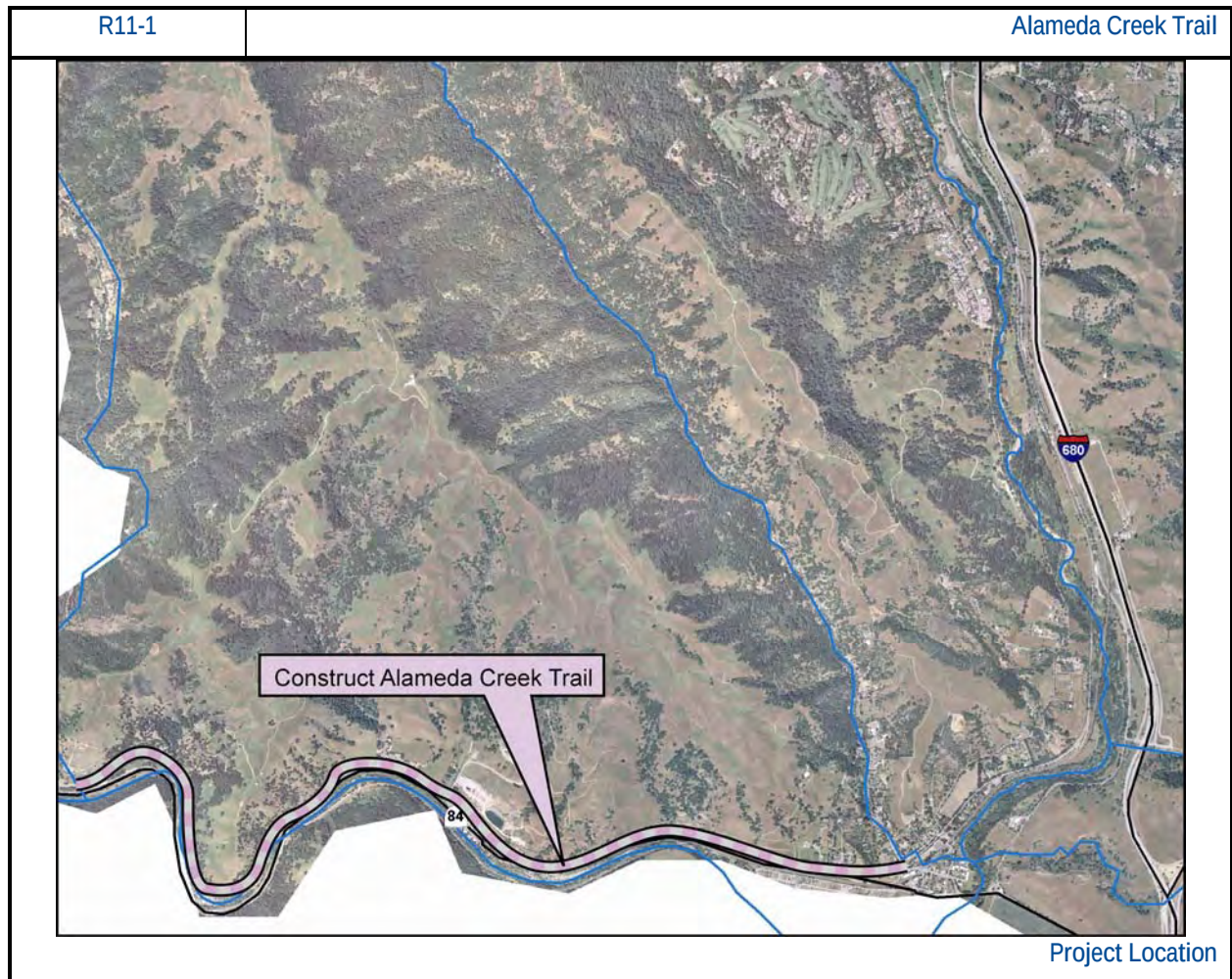
Project Schematic

R11-0

Reach 11 Summary Map



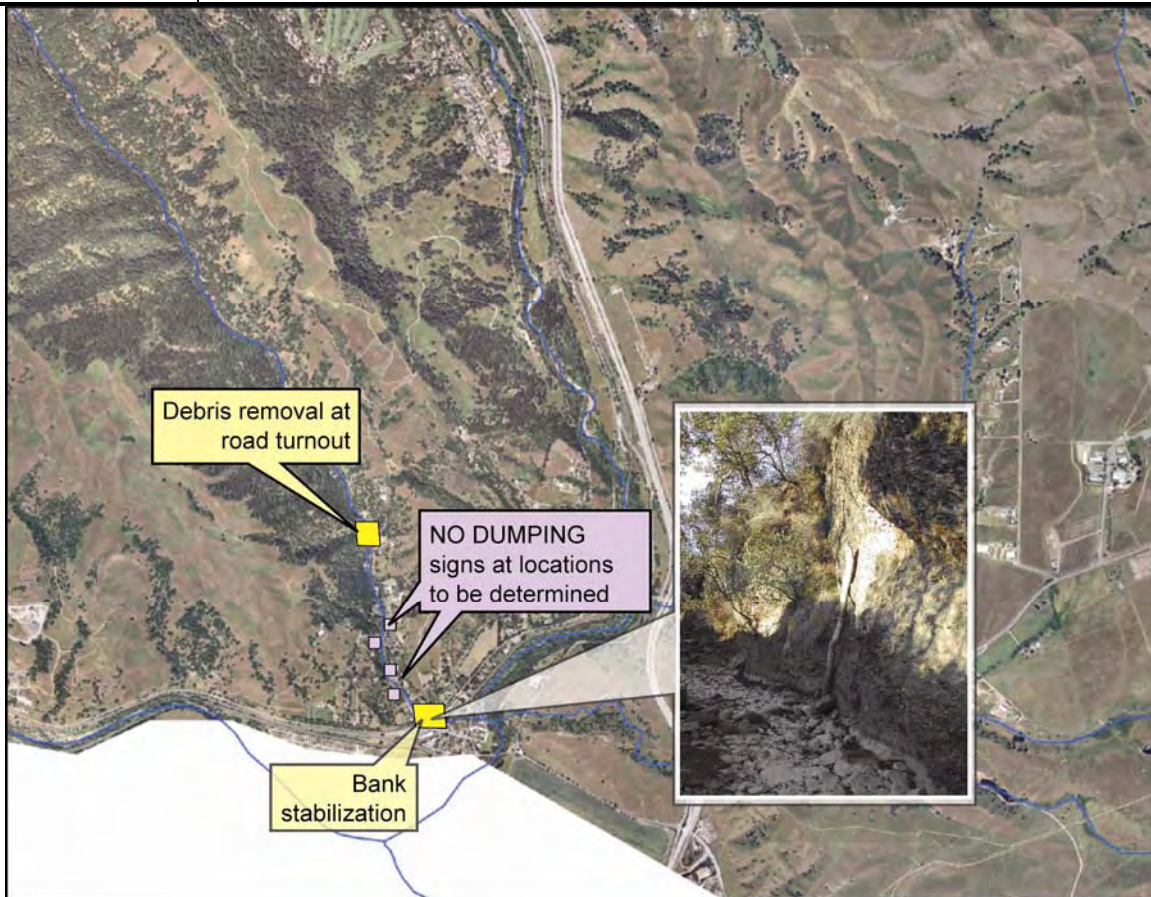
Project Number	R11-1
Project Name	Alameda Creek Trail
Project Location	Alameda Creek
Purpose	Create a system of regional trails.
Project Components	1. Construct 12,600 feet of trail along Alameda Creek to join proposed trail along lower reach of Arroyo de la Laguna (Project R10-5: Lower ADLL Improvement Project). Project includes acquisition of 5.8 acres for trail.
Capital Cost Estimate	\$3,100,000
Implementation Issues	• Coordination with EBRPD. • Coordination with Alameda County, SFPUC, and other property owners.
Project Precursors	-
Benefits	Provides trail connectivity with proposed trail along Arroyo de la Laguna.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: none Water Supply: none Water Quality: none Habitat & Environment: none Recreation, Trails, and Public Education: C, D
Maintenance Activities	Trail Maintenance: • Conduct annual inspection of trails. • Seal cracks and repair pavement on trails, as needed. • Clear debris and vegetation growth, as needed. • Repair signs and structures, as needed.
Annual Maintenance Cost Estimate	\$111,000
Notes	• Potential to create trail to link up to regional trail system. Recommend pursuing railroad Right-of-Way (ROW) as trail route if railroad tracks on right bank of creek (looking upstream) are under use or abandoned. Existing 1.5 mile long trail along left bank of creek (looking upstream). Good staging area for future trail along Alameda Creek. • Good aquatic habitat for anadromous fish species. Stream contains pools and riffles. Well vegetated riparian habitat. • Project design should incorporate measures to protect special-status species habitat.
References	-



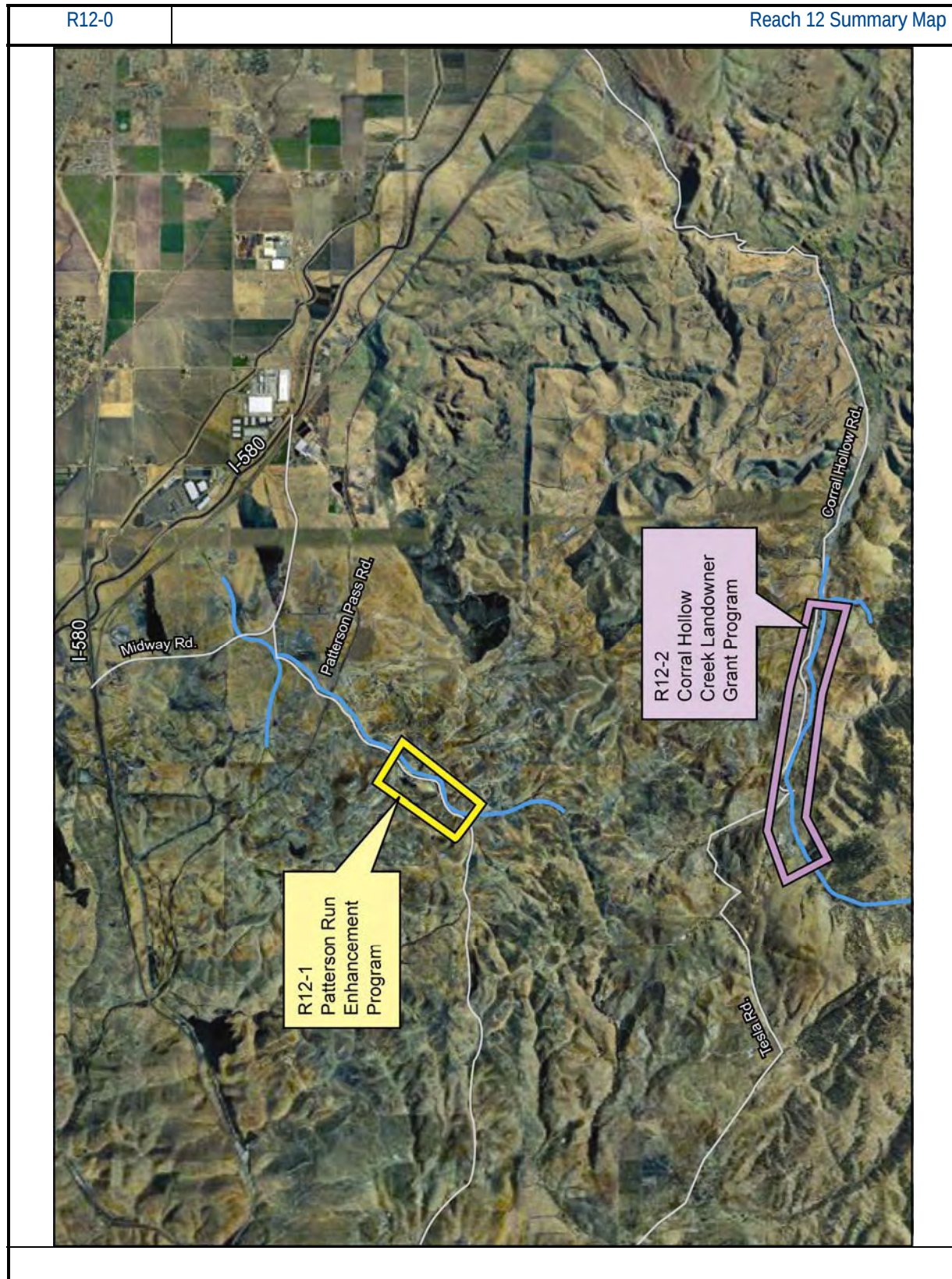
Project Number	R11-2
Project Name	Sinbad Creek Project
Project Location	Sinbad Creek
Purpose	Stabilize bank at confluence of Sinbad Creek with ADLL. Encourage community participation in creek stewardship.
Project Components	1. Establish a volunteer "Adopt-a-Creek" program that includes trash clean-up at road turnouts. Project includes installation of "no dumping" signs (4) at road turnouts. 2. Conduct trash removal at road turnout (approximately 370 CY). 3. Conduct bank stabilization activities along approximately 80 feet at confluence with ADLL (STA 20+00). Project includes: • Placement of approximately 300 CY of boulders along toe of bank. • Re-vegetation of 80 feet of bank (approximately 0.055 acres). • Acquisition of 0.055 acres for bank stabilization.
Capital Cost Estimate	\$310,000
Implementation Issues	• Coordination with SFPUC. • Permitting in compliance with CWA Section 401/404.
Project Precursors	-
Benefits	Stabilize banks at confluence with ADLL.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: A Water Supply: none Water Quality: C Habitat & Environment: none Recreation, Trails, and Public Education: A, B, E
Maintenance Activities	Education: • Repair interpretive kiosks, as needed. • Remove trash, as needed. Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed. Vegetation Maintenance: • Conduct annual inspection of planted riparian vegetation. • Conduct maintenance of riparian vegetation by utilizing a combination of methods including hand removal, mechanical or chemical clearing. The annual maintenance cost estimate is based on hand removal of riparian vegetation. • Collect and dispose of vegetation debris.
Maintenance Cost Estimate	\$4,000
Notes	• Houses are encroaching against creek banks. Otherwise, natural channel with no sign of erosion in headwaters. • Major bank erosion near confluence with ADLL. Vertical wall with houses adjacent to bank. • Investigate potential flood hazard in headwaters due to proximity of stream to houses. • No space for a trail along the creek. • Project design should incorporate measures to protect special-status species habitat.
References	-

R11-2

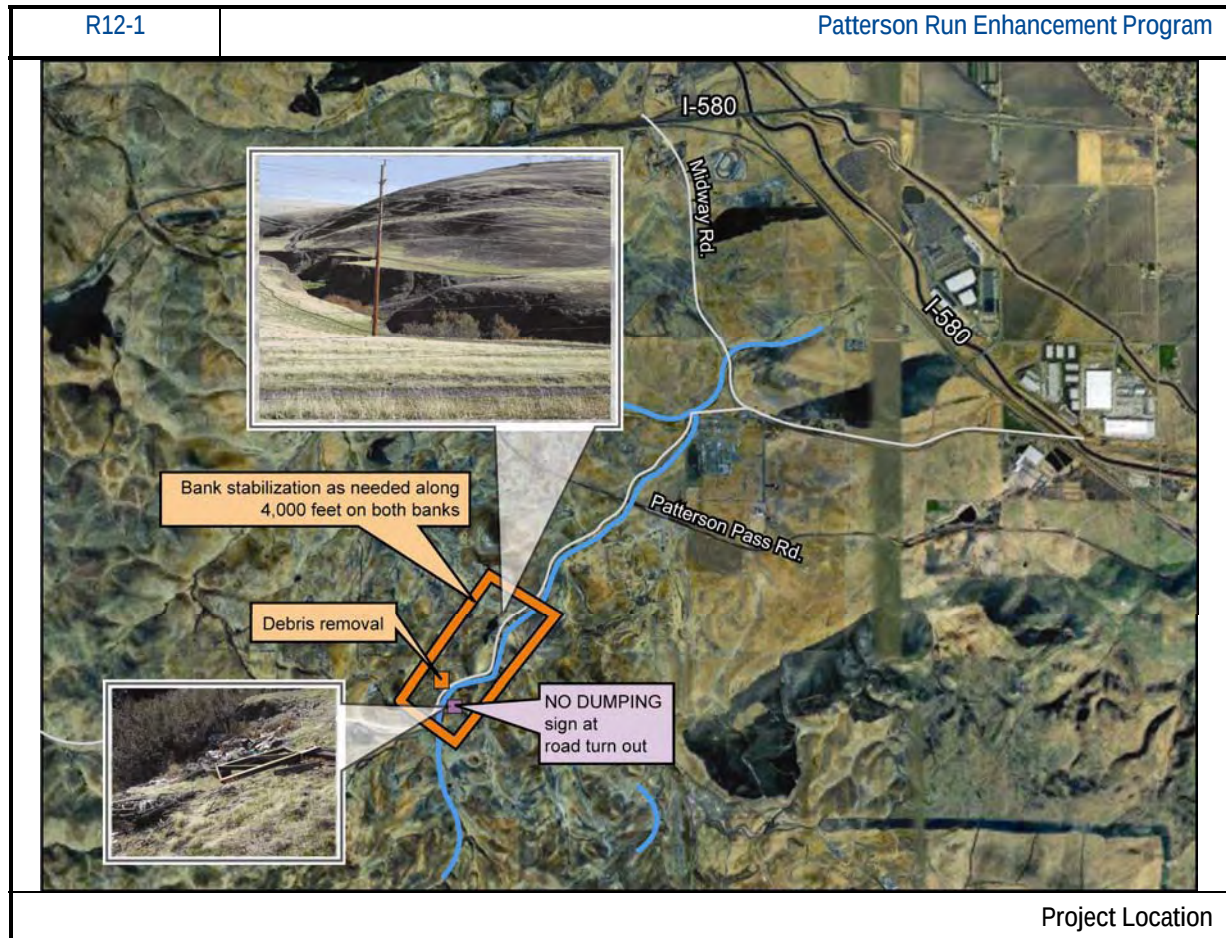
Sinbad Creek Project



Project Location



Project Number	R12-1
Project Name	Patterson Run Enhancement Program
Project Location	Patterson Run (Line Y-1)
Purpose	Stabilize creek banks. Encourage community participation in creek stewardship. Encourage implementation of land Best Management Practices.
Project Components	1. Establish a volunteer "Adopt-a-Creek" program that includes trash clean-up at road turnouts. Project would include installation of "no dumping" signs at road turnouts (2). 2. Remove trash at road turnout (approximately 370 CY). 3. Stabilize approximately 4,000 feet of channel on each bank by grading and revegetating.
Capital Cost Estimate	\$820,000
Implementation Issues	Permitting in compliance with Clean Water Act Sections 401/404.
Project Precursors	-
Project Benefits	Reduce sediment input.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: A Water Supply: none Water Quality: C Habitat & Environment: none Recreation, Trails, and Public Education: A, B, E
Maintenance Activities	Interpretive kiosks: • Repair signs, as needed. Maintenance of bank stabilization measures: • Conduct annual inspection of site. • Conduct repairs of bank stabilization measures, as needed.
Annual Maintenance Cost Estimate	\$175,000
Notes	• Erosion along 8,000 feet of channel banks. • Area may be susceptible to landslides during storm events as a result of erosion, earthquake, and heavy rain. • Trash on creek banks at road turnout. Tires on field adjacent to creek.
References	-



Project Number	R12-2
Project Name	Corral Hollow Creek Landowner Grant Program
Project Location	Corral Hollow Creek (Line X-1)
Purpose	Reduce property loss and downstream sedimentation. Encourage community participation in creek stewardship.
Project Components	1. Conduct localized bank stabilization activities along approximately 1,000 feet on each bank. Project includes acquisition of approximately 0.9 acres for bank stabilization. 2. Establish a volunteer "Adopt-a-Creek" program to encourage community participation in creek stewardship and raise awareness on erosion issues.
Capital Cost Estimate	\$200,000
Implementation Issues	• Coordination with local landowners. • Permitting, especially Clean Water Act Section 401/404.
Project Precursors	-
Project Benefits	• Promotes community involvement in creek stewardship. • Reduces erosion.
Goals/Objectives Addressed	Flood Protection & Drainage: none Erosion and Sedimentation: A Water Supply: none Water Quality: C Habitat & Environment: none Recreation, Trails, and Public Education: A
Maintenance Activities	
Annual Maintenance Cost Estimate	\$45,000
Notes	• Project involves creation of a grant program to help land owners to protect against future property loss due to erosion. • Localized cattail invasion near bridge crossing to private property. • Two circular culverts at road crossing into Carnegie State Vehicular Recreation Area. • Potential for trail but would require purchase of easements from private landowners. • Close to the historic town of Carnegie. Potential for coordination with State Parks to add trails and create historic park.
References	-

R12-2

Corral Hollow Creek Landowner Grant Program



Project Location

APPENDIX 3.2

Hydrology and Water Quality

APPENDIX 3.2

HYDROLOGY AND WATER QUALITY

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The East County Area Plan (amended November 2002), part of the Alameda County General Plan, includes the following policies that are relevant to the proposed project:

Policy 306. The County shall protect surface and groundwater resources by:

- Minimizing sedimentation and erosion through control of grading, quarrying, cutting trees, removal of vegetation, placement of roads and bridges, use of off-road vehicles, and animal-related disturbance of the soil.

Program 108. The County shall implement all federal, state, and locally imposed statutes, regulations, and orders that apply to storm water quality.

The Watercourse Protection Ordinance (Alameda County, 1990) was enacted to restrict discharge of polluted materials to watercourses and encroachment of new development into watercourses within the unincorporated county. Implementation of the ordinance protects surface water and groundwater recharge areas from erosion, sedimentation, and other sources of pollution.

The county implements all federal, state, and locally imposed statutes, regulations, and orders that apply to stormwater quality, including NDPES stormwater permits issued by the RWQCB to the Alameda Countywide Clean Water Program, NPDES General Permit for Storm Water Discharges (General Construction Permit), Water Quality Control Plan, and letters issued by the RWQCB under the Porter-Cologne Water Quality Act.

In addition to the Watercourse Protection Ordinance, the county has a grading erosion and sediment control ordinance requiring that trenching and grading incidental to the construction or installation of approved underground pipelines shall be backfilled and the surface restored to its original condition, including reseeding or otherwise restoring vegetation on all disturbed earth surfaces if slopes exceed 2 percent, as soon as possible after such grading work is completed.

CITY OF PLEASANTON

The City of Pleasanton General Plan (1996) includes the following that are relevant to the proposed project:

Policy 9. Protect the quality and quantity of surface water and groundwater in the Planning Area.

Program 9.7. Support the policies and programs contained in the Water Quality Control Plan for the San Francisco Bay Basin to the extent they are consistent with the City's policies for water quality.

Policy 17. (Clean Water Program) Implement stormwater runoff requirements, as recommended by the Alameda Countywide Clean Water Program, with as little impact on development and business costs as possible.

Program 17.1. Incorporate conditions of approvals developed by the Alameda Countywide Clean Water Program, as appropriate, for new development and discretionary permits.

Program 17.3. Evaluate the effect of development on stormwater runoff in the CEQA process.

Program 17.4. Encourage the use of site planning and design techniques to minimize impacts to water quality, including minimizing land disturbance, minimizing impervious surfaces, clustering development, preserving open space, and maintaining riparian areas with buffer zones to reduce runoff into waterways.

Program 17.5. Include stormwater quality requirements in plans and contract specifications for City projects.

Program 17.6. Require the use of Best Management Practices for construction activities and ongoing business operations to prevent contaminants from entering the storm drain system.

Program 17.7. Review the City's erosion and sedimentation prevention program to ensure that erosion prevention controls and enforcement are being implemented. Create an ordinance, if necessary, to accomplish these requirements.

Program 17.8. Conduct construction site field inspections to ensure the proper implementation and maintenance of erosion prevention and materials/waste management to effectively prohibit non-stormwater discharges.

The City of Pleasanton City Council has established Chapter 9.14, Stormwater Management and Discharge Control Ordinance (No. 1572). The purpose of this ordinance is to ensure the future health, safety, and general welfare of Pleasanton citizens by controlling non-storm runoff and reducing pollutants in stormwater discharges and to protect and enhance the water quality of watercourses, water bodies, and wetlands. The ordinance includes provisions to protect both the storm system and natural water courses within city limits. The ordinance prohibits non-stormwater discharges to the storm system and includes standards for:

- Preventing littering;
- Cleaning parking lots and gas station pavement;
- Providing BMPs for new development and redevelopment;
- Providing Notice of Intent, complying with and undertaking all activities described in an individual general stormwater permit; and
- Complying with BMPs.

The ordinance also includes the following:

- Responsible parties for administration and inspecting;
- Discharge prohibitions and exceptions to discharge prohibitions;
- Prohibitions of illicit discharge and illicit connections; and
- Reduction of pollutants in stormwater by individual citizens, occupants or tenants, operators of parking lots and gas stations, construction contractors, industrial dischargers, and persons owning or leasing property through which a watercourse passes.

In addition to the above provisions, the ordinance specifies the penalties for violations.

CITY OF LIVERMORE

The City of Livermore General Plan (2004) contains the following policies that are relevant to the proposed project:

Goal INF-3. Collect, store, and dispose of stormwater in ways that are safe, sanitary, environmentally acceptable and financially sound while maintaining the highest standards required to enhance the quality of life for existing and future residents.

Policy INF-3.2. P3. The City shall take all necessary measures to regulate runoff from urban uses to protect the quality of surface and ground-waters and other resources from detrimental conditions.

Policy OSC-2.1.P1. Require the implementation of Best Management Practices (BMPs) to minimize erosion, sedimentation, and water quality degradation resulting from the construction of new impervious surfaces.

Policy OSC-2.1.P2. The City shall take all necessary measures to regulate runoff from urban uses to protect the quality of surface and groundwater.

Goal PS-2. Reduce hazards related to flooding or inundation.

Policy PS-2.1.P4. Only which have low flood damage potential and do not threaten other lands during times of flooding shall per permitted in the 100-year flood zone.

Policy PS-2.1.P5. Development shall only be allowed on lands within the 100-year flood zone, if it will not:

- (a) Create danger to life and property due to increased flood heights or velocities caused by excavation, fill, roads, and intended use.
- (b) Create difficult emergency vehicle access in times of flood.
- (c) Create a safety hazard due to the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters expected at the site.
- (d) Create excessive costs in providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities.
- (e) Interfere with the existing waterflow capacity of the floodway.
- (f) Substantially increase erosion and/or sedimentation.
- (g) Contribute to the deterioration of any watercourse of the quality of water in any body of water.
- (h) Require storage of material, or any substantial grading or placement of fill.

Policy PS-2.1.P6. Both public and private service facilities and utilities in existing 100-year flood zones shall be floodproofed to a point at or above the base flood elevation.

Policy PS-2.1.P7. The City shall prevent the construction of flood barriers within the 100-year flood zone which will divert flood water or increase flooding in other areas.

APPENDIX 3.3

Geology and Soils

APPENDIX 3.3

GEOLOGY AND SOILS

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The East County Area Plan (amended November 2002), part of the Alameda County General Plan, includes the following policies that are relevant to the proposed project:

Policy 309. The County shall not approve new development in areas with potential for seismic and geologic hazards unless the County can determine that feasible measures will be implemented to reduce the potential risk to acceptable levels, based on site-specific analysis. The County shall review new development proposals in terms of the risk caused by seismic and geologic activity.

Policy 310. The County, prior to approving new development, shall evaluate the degree to which the development could result in loss of lives or property, both within the development and beyond its boundaries, in the event of a natural disaster.

Policy 311. The County shall ensure that new major public facilities, including emergency response facilities, and water storage, wastewater treatment and communications facilities, are sited in areas of low geologic risk.

Policy 312. The County shall ensure that major transportation facilities and pipelines are designed, to the extent feasible, to avoid or minimize crossings of active fault traces and to accommodate fault displacement without major damage that could result in long-term disruption of service.

Policy 315. The County shall require that buildings be designated and constructed to withstand groundshaking forces of a minor earthquake without damage, of a moderate earthquake without structural damage, and of a major earthquake without collapse of the structure. The County shall require that critical facilities and structures (e.g., hospitals, emergency operations centers) be designed and constructed to remain standing and functional following an earthquake.

CITY OF PLEASANTON

The City of Pleasanton General Plan (1996) contains the following policies that are relevant to the proposed project:

Policy 1. Restrict development in areas prone to seismic safety hazards.

Program 1.3. Prohibit construction of facilities and systems vital to the public health and safety (e.g., water facilities, fire stations, hospitals, communication facilities, etc.) within the Alquist Priolo Earthquake Fault Zones.

Policy 2. Investigate the potential for seismic hazards during the development review process, and implement soil engineering and construction standards which minimize potential danger from earthquakes.

Program 2.2. Design and construct all structures to address potential seismic and geologic hazard conditions according to the State Uniform Building Code standards or more stringent standards. All structures and facilities not addressed by the UBC shall be designed and constructed to mitigate potential seismic and geologic hazards as recommended by site specific soils, geologic, and/or geotechnical engineering studies.

Policy 5. Investigate the potential for geologic hazards as part of the development review process, and maintain this information for the public record.

Program 5.1. Require site-specific soils studies for all new development prior to the issuance of building permits and prior to the approval of final improvement plans in areas with “Moderate,” “Moderate to High,” or “High” hazards for the following geologic hazards: seismic shaking, lateral spreading, differential settlement, lurch cracking, liquefaction, erosion, and expansive soils.

Program 5.2. Require site-specific geologic and/or geotechnical engineering studies prior to development approval in areas with “Moderate,” “Moderate to High,” or “High” hazards for the following geologic hazards: surface fault rupture, bank failures, rock falls, and landslides; and for areas with slopes equal or greater than 20 percent.

Program 5.3. Require measures to mitigate potential geologic safety hazards during adverse conditions such as saturated soils and groundshaking, and during grading of the site for roads, installation of infrastructure, and creation of building pads. Mitigation measures identified by the site engineering studies shall be incorporated into the project design.

Program 5.4. Require technical review and analysis of geotechnical studies by a qualified consulting geotechnical engineer reporting to the City. Incorporate the recommendations of the City’s consulting engineer into the project design.

Program 5.5. Permit development in areas with a “high” susceptibility to geologic hazards only when geologic and soils investigations demonstrate that hazards can be mitigated by accepted engineering and construction techniques. Mitigation measures identified by the investigations shall be incorporated into the project design and subject to approval by the City’s reviewing geologist/engineer.

CITY OF LIVERMORE

The City of Livermore General Plan (2004) contains the following policies that are relevant to the proposed project:

Policy OSC-3.1.P1. Undeveloped lands that are State-designated as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland shall be preserved, to the greatest extent feasible, for open space or agricultural.

Policy PS-1.2.P2. Areas of high shrink-swell potential soils shall incorporate suitable mitigation measures. If development is allowed in areas of high shrink-swell potential,

special measures must be undertaken in site grading, foundation design and construction to alleviate potential movements.

Policy PS-1.2.P3. The City shall control site preparation procedures and construction phasing to reduce erosion and exposure and exposure of soils to the maximum extent possible.

APPENDIX 3.4

Land Use

APPENDIX 3.4

LAND USE

COUNTY AND LOCAL REGULATIONS, GOALS, AND POLICIES

ALAMEDA COUNTY EAST COUNTY AREA PLAN

In the 1970s, Alameda County began a General Plan amendment process, which included development of documents on a geographic, or planning unit, basis. The geographic planning unit associated with the proposed project is covered under the East County Area Plan (amended 2002).

The East County planning area encompasses 418 square miles of unincorporated eastern Alameda County that surrounds the Cities of Dublin, Livermore, Pleasanton, and a portion of Hayward. The East County Area Plan was adopted by the Board of Supervisors in May 1994, and revised most recently in November 2002. Plans and policies relevant to the proposed project are discussed below:

Policy 13. The County shall not provide nor authorize public facilities or other infrastructure in excess of that needed for permissible development consistent with the Initiative. This policy shall not bar 1) new, expanded, or replacement infrastructure necessary to create adequate service for the East County, 2) maintenance, repair or improvements of public facilities which do not increase capacity, and 3) infrastructure such as pipelines, canals, and power transmission lines which have no excessive growth-inducing effect on the East County area and have permit conditions to ensure that no service can be provided beyond that consistent with development allowed by the Initiative. “Infrastructure” shall include public facilities, community facilities, and all structures and development necessary to the provision of public services and utilities.

Policy 52. The County shall preserve open space areas for the protection of public health and safety, provision of recreational opportunities, production of natural resources (e.g. agriculture, windpower, and mineral extraction), protection of sensitive viewsheds, preservation of biological resources, and the physical separation between neighboring communities.

Policy 54. The County shall approve only open space, park, recreational, agricultural, limited infrastructure, public facilities (e.g., limited infrastructure, hospitals, research facilities, landfill sites, jails, etc.) and other similar and compatible land uses outside the Urban Growth Boundary.

Policy 60. The County shall encourage active public use of publicly-owned open space lands close to existing and planned communities in locations where such use does not conflict with the protection of biological resources.

Policy 63. The County shall require that open space within developed areas be designed and maintained to minimize fire hazards and ensure compatibility between development and any significant biological resources.

Policy 71. The County shall conserve prime soils by (Class I and Class II, as defined by the USDA Soil Conservation Service Land Capability Classification) and Farmland of Statewide Importance and Unique Farmland (as defined by the California Department of Conservation Farmland Mapping and Monitoring Program) outside the Urban Growth Boundary.

Policy 74. The County shall require that, where conflicts between a new use and existing use are anticipated, the burden of mitigating the conflicts be the responsibility of the new use.

Policy 101. The County shall encourage public water management agencies to explore recreational opportunities on watershed lands, particularly reclaimed quarries, where recreational use would not conflict with watershed protection objectives.

Policy 110. The County shall require that developments are sited to avoid or, if avoidance is infeasible, to minimize disturbance of large stands of mature, healthy trees and individual healthy trees of notable size and age. Where healthy trees will be removed, the County shall require a tree replacement program which includes a range of tree sizes, including specimen-sized trees, to achieve immediate visual effect while optimizing the long-term success of the replanting effort.

Policy 116. To the maximum extent possible, development shall be located and designed to conform with rather than change natural landforms. The alteration of natural topography, vegetation, and other characteristics by grading, excavating, filling or other development activity shall be minimized. To the extent feasible, access roads shall be consolidated and located where they are least visible from public view points.

Policy 117. The County shall require that where grading is necessary, the off-site visibility of cut and fill slopes and drainage improvements is minimized. Graded slopes shall be designed to simulate natural contours and support vegetation to blend with surrounding undisturbed slopes.

Policy 118. The County shall require that grading avoid areas containing large stands of mature, healthy vegetation, scenic natural formations, or natural watercourses.

Policy 122. The County shall encourage that wetland mitigation be consolidated in areas that are relatively large and adjacent to or otherwise connected to open space. To the extent possible, these areas should be included in, adjacent to, or linked through open space corridors with lands designated as “Resource Management” that are managed specifically for the preservation and enhancement of biological resources.

Policy 124. The County shall encourage the maintenance of biological diversity in East County by including a variety of plant communities and animal habitats in areas designated for open space.

Policy 126. The County shall encourage no net loss of riparian and seasonal wetlands.

Policy 138. The County shall allow development and expansion of major public facilities (e.g., hospitals, research facilities, landfill sites, jails, etc.) in appropriate locations inside

and outside the Urban Growth Boundary consistent with the policies and Land Use Diagram of the *East County Area Plan*.

Policy 139. The County shall ensure that new major public facilities are properly sited to avoid land use conflicts and potential health and safety risks.

Policy 176. The County shall allow development and expansion of transportation facilities (e.g. streets and highways, public transit, bicycle and pedestrian paths, airports , etc.) in appropriate locations inside and outside the Urban Growth Boundary consistent with the policies and Land Use Diagram of the East County Area Plan.

Policy 188. The County shall promote the use of transit, ridesharing, bicycling, and walking, through land use planning as well as transportation funding decisions.

Policy 211. The County shall create and maintain a safe, convenient, and effective bicycle system that maximizes bicycle use.

Policy 212. The County shall create and maintain a safe and convenient pedestrian system that links residential, commercial, and recreational uses and encourages walking as an alternative to driving.

Policy 213. The County shall support construction of multiple use trails (e.g., pedestrian and bicycle uses) along the “Iron Horse” (*see definition in Table 1*) and the Altamont Pass Southern Pacific rights-of-way only with assurances that public transit use will also be provided within the corridor.

In addition, the ECAP identifies policies associated with quarries and regionally significant aggregate resource areas. These policies are relevant to several of the reaches that are located in the quarry area. Policies relevant to the proposed project include the following:

- Policy 160. states that “the County shall ensure that where quarry operations are located in areas designated as Water Management, extraction of the aggregate resource shall be allowed in the short-term. Reclamation of the land for water management and other compatible uses shall occur subject to conditions of surface Mining Permits and Reclamation Plans and consistent with the Specific Plan for Livermore-Amador Valley Quarry Area Reclamation or the comparable plan prepared for Sunol Valley / San Francisco Water Department watershed lands pursuant to Policy 161 and Program 71, whichever is applicable.

ALAMEDA COUNTY SPECIFIC PLAN FOR LIVERMORE-AMADOR VALLEY QUARRY AREA RECLAMATION

The *Alameda County Specific Plan for Livermore-Amador Valley Quarry Area Reclamation* (adopted November 1981) was prepared by three mining operators in conjunction with the Alameda County Planning Commission and input by Zone 7.¹ The Specific Plan discusses

¹ Environ prepared a Livermore-Amador Valley Quarry Reclamation Plan in 1977, which develops the background and an overall master Reclamation Plan for the quarry area. In July 1979, Alameda County prepared an Environmental Impact Report (EIR) to consider the impacts of the Reclamation Plan. Environ prepared the 1980 Reclamation Plan Alternative Reclamation Plan to include measures that mitigate the impacts identified in the EIR

objectives, policies, and implementation of a reclamation program for the 3,280 acres sand and gravel quarry area, and serves as the framework and basis for future, detailed reclamation plans. It outlines the mining operator's obligation to dedicate the existing lakes, exterior perimeter areas and associated appurtenances to Zone 7 in order to mitigate for the adverse effects of mining on water resources, as well as return depleted lands to productive use. The Plan identifies the need to create a "Chain of Lakes," connected in series, to provide a surface storage and conveyance system to replace a portion of the pre-existing subsurface water storage and conveyance system feeding the groundwater basin. The document provides staging plans for 1995, 2010, and 2030, and identifies land uses associated with reclaimed areas for the year 2030. These uses include water management, agriculture, recreation, and various classes of development (residential, commercial, and industrial). Policy 12 of the Plan specifies that "Water areas may be used by Zone 7 for water conservation, water transmission, groundwater recharge, flood control and water quality management. Water areas may also be used for recreation, fish farming, and other productive uses to the extent such uses would be compatible with the first-named uses" (Alameda County Planning Department, 1979).

CITY OF PLEASANTON GENERAL PLAN

No land use policies have been identified in the City of Pleasanton General Plan (1996) that relate to the siting or use of public utility infrastructure such as the proposed well facilities. The following policies are related to the provisions of public services are shown in **Section 3.11, Public Services and Utilities**.

BERNAL PROPERTY SPECIFIC PLAN

The City of Pleasanton prepared the Bernal Property Specific Plan (Adopted by the City Council Resolution No. 00-111, August 21, 2000). The 300-acre Bernal Property is currently owned by SFPUC, but has been identified for acquisition by the City of Pleasanton. Based on extensive citizen participation, the City has prepared a Specific Plan for the Bernal Property to establish the future development potential and orderly development the site. The Bernal Property Specific Plan identifies the objectives and policies associated with its development, in the areas of: land use, open space, transportation / circulation, public facilities, and conservation and environmental mitigation.

CITY OF LIVERMORE GENERAL PLAN

The City of Livermore General Plan (2004) was recently adopted in 2004, and governs land use and development within the Livermore city limits. Goals and policies contained within the General Plan that are relevant to the proposed project include the following:

Goal LU-7. Ensure that alterations to existing topography are minimized.

and incorporates the results of meetings between mining operators and Zone 7. The 1981 Alameda County Specific Plan for Livermore-Amador Valley Quarry Area Reclamation was adopted on November 5, 1981.

Objective LU-7.1. To allow development that does not create impacts to the existing topography in North Livermore.

Policy P1. Consistent with the other provisions of LU-6.1.P1 through P4; alteration of topography by grading, excavating, filling, or any development activity shall be minimized. Where feasible, access roads shall be located, including by consolidation, where they are least visible from public spaces.

Policy OSC-3.1.P1. Undeveloped lands that are State-designated as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland shall be preserved, to the greatest extent feasible, for open space or agricultural use.

CITY OF DUBLIN GENERAL PLAN

Open Space for Outdoor Recreation

Guiding Policies – Eastern Extended Planning Area

- G. Establish a trail system with connections to planned regional and sub-regional systems, including north-south corridors such as EBRPD’s proposed trail along Tassajara Creek north to Mt. Diablo State Park.
- H. Using the natural stream corridors and major ridgelines, establish a comprehensive, integrated trail network within the planning area that permits safe and convenient pedestrian and bicycle access within urban areas and between urban areas and open space areas.

Implementing Policy – Eastern Extended Planning Area

- K. Require land dedication and improvements for trails along designated stream corridors.

Guiding Policies – Western Extended Planning Area

- O. Create a local trail network which links large areas of permanent open space, while providing convenient access from nearby residential areas. Maximize visual exposure to open space, and provide multiple local physical access points to increase public enjoyment of open space.

APPENDIX 3.5

Biological Resources

APPENDIX 3.5

BIOLOGICAL RESOURCES

County and Local Regulations, Goals, and Policies

Tree Preservation

Alameda County East County Area Plan

Policy 110. Alameda County requires that developments are sited to avoid or, if avoidance is infeasible, to minimize disturbance of large stands of mature, healthy trees and individual trees of notable size and age. Where healthy trees are removed, the County requires a tree replacement program which includes a range of tree sizes, including specimen-sized trees, to achieve immediate visual effect while optimizing the long-term success of the replanting effort.

Chapter 12.08 of the of the Alameda County General Ordinance Code (Ordinance No. 0-2002-77) provides guidelines protecting trees (adopted by the Board of Supervisors on May 7, 2002). An encroachment permit is required for the removal of any tree (regardless of size and health) from the County right-of-way, and the responsibility rests on the adjacent property owner, “who shall bear all costs of the removal and associated restoration of the right-of-way.” All removed trees shall be replaced within 90 days by the owner at the owner’s expense, and all replacements shall be in conformance to the standards and procedures provided by the director. A written maintenance agreement may be required as a condition of the permit.

Planting, pruning, trimming, guying, staking, root trimming, or removal of trees within the right-of-way would also require an encroachment permit. This includes “the installation of trees and all associated facilities, such as irrigation systems, tree wells, root barriers and supports, and all subsequent actions which could in any way affect the growth or health of such trees.” As with the removal and replanting of trees, the responsibility is that of the adjacent property owner, who bears the costs of all necessary maintenance of the tree and the associated facilities. All maintenance and repair located within the right-of-way shall be performed by licensed landscape contractors, and “all general trimming and pruning shall be in compliance with the International Society of Arboriculture Pruning and Trimming Standards and the Standard Practices for Tree Care Operations (ANSI A300-1995).” The ordinance further states that any person or utility proposing to encroach in the vicinity of an existing tree shall submit a plan showing the extent of the activity, and the director may require that the plan be prepared by a certified arborist.

City of Pleasanton

Heritage trees, as defined by the City of Pleasanton, include all trees (except fruit or nut trees in orchards) with a circumference of 55 inches or more measured 4.5 feet above ground level; multi-trunked trees of which the two largest trunks have a total circumference of 55 inches or more measured 4.5 feet above ground level; any trees 35 feet or taller; trees with historical significance; or a tree within a stand that depends on each tree for survival or the area's natural beauty (City of Pleasanton, 1996a). Removal of heritage trees for development projects within the City of Pleasanton requires a tree survey plan of the project area completed by one of the city's consulting arborists, including all trees six inches or more in diameter at breast height (dbh). A permit from the Department of Public Works and Utilities and mitigation developed on a case-by-case basis, usually at a replacement ratio of 4:1 using 24-inch box trees may be required.

The City of Pleasanton General Plan (1996b) contains the following policy that is relevant to the proposed project.

Policy. Preserve heritage trees throughout the Planning Area. Follow the provisions of the City's Heritage Tree Ordinance when reviewing future development projects.

City of Livermore

The City of Livermore protects all vegetation planted within the public right-of-way on city streets as well as ancestral trees, which are specific trees or stands of trees so designated by the Livermore beautification committee. The City of Livermore requires a permit from the city maintenance superintendent to remove street vegetation and ancestral trees, but does not specify mitigation for removal.

The City of Livermore General Plan (2004) contains the following general policy that is relevant to the proposed project.

Objective OSC-1. Conserve Livermore's native trees and vegetation, which are important biological resources within Planning Area.

Special-Status Species Preservation

Alameda County East County Area Plan

Policy 125. The County encourages preservation of areas known to support special-status species.

City of Pleasanton

Policy. Potential impacts on wildlife populations and habitats should be included in CEQA review of development projects.

City of Livermore

Objective OSC-1.3. Conserve Livermore's native trees and vegetation, which are important biological resources within the Planning Area.

Preserve and Protect Streams, Creeks, and Wetland Habitat

Alameda County East County Area Plan

Policy 124. The County shall encourage the maintenance of biological diversity in East County including a variety of plant communities and animal habitats in areas designated for open space.

Policy 126. The County encourages no net loss of riparian and seasonal wetlands.

Policy 127. The County encourages the preservation of East County oak woodland plant communities.

Policy 129. The County shall protect existing riparian woodland habitat present along Arroyo Mocho, Arroyo Del Valle, Arroyo Las Positas, Arroyo de la Laguna; and Alamo, Tassajara, and Alameda Creeks.

City of Pleasanton

Policy. Preserve and enhance streambeds and channels in a natural state, except where needed for flood and erosion control.

Policy. Develop and implement ordinances and policies that provide for the preservation and restoration of riparian corridors, and establish mitigation requirements for modifications to such corridors.

Policy. Provide for the preservation of wildlife corridors, and require mitigation that minimizes barriers across wildlife corridors created by roadways and developments.

Policy. Preserve and enhance streambeds and channels in a natural state, except where needed for flood control and erosion control. Projects adjacent to the arroyos should be designed to protect habitat areas. For projects known to have or that may have wetlands present within their boundaries, preserve and enhance the resource value of the wetlands through project development design measures.

City of Livermore

Policy. Riparian woodlands and freshwater marshes shall be preserved. Developers shall be required to mitigate possible adverse impacts upon these resource areas. To the extent possible, arroyos and creeks shall be preserved in their natural state.

State and Federal Regulations, Goals, and Policies

California Environmental Quality Act

In general, projects approved through the California Environmental Quality Act (CEQA) process should show that new land uses are in compliance with the wetlands provisions of the federal Clean Water Act (CWA) and with state and federal endangered species acts (CESA and FESA, respectively).

CEQA directs each lead agency to consult with the CDFG on any project the agency initiates that is not statutory or categorically exempt from CEQA. CEQA Guidelines (Section 15065a) declares that reducing the number or restricting the range of rare, threatened, or endangered plants or animals may have a significant effect. The Native Plant Protection Act also affords limited protection to special-status plant species. A formal consultation process must be initiated with the CDFG for projects that may or will have an adverse effect on state-listed species.

CEQA (Section 15206) specifies that a project shall be deemed to be of statewide, regional, or area-wide significance if it would substantially affect sensitive wildlife habitats including but not limited to riparian lands, wetlands, bays, estuaries, marshes, and habitats for rare and endangered species as defined by Section 15380.

California Department of Fish and Game

Under Section 1601 of the California Fish and Game Code, an agency or public utility proposing to substantially divert the natural flow of a stream, substantially alter its bed or banks, or use any material from the streambed, must first enter into a Streambed Alteration Agreement (SAA) with CDFG. An SAA would be required for any construction activity that would occur in one of the flood control channels or creeks found in the wellfields. Construction cannot be initiated on the site until an SAA is executed. The CDFG would only enter into an SAA once all other project permits and certifications have been obtained. The SAA is applied for by submitting a CDFG Streambed Alteration Notification form and a nonrefundable application fee (for projects costing more than \$25,000) to the CDFG. The SAA can typically be obtained within a few months, provided proposed mitigation (as developed during the environmental review process) is acceptable to the CDFG. The CDFG, while being able to impose reasonable conditions on the agreement, may not decline to enter into an agreement.

San Francisco Regional Water Quality Control Board

Water Quality Regulation

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) regulates water quality within California and established the authority of the State Water Resources Control Board and the nine Regional Water Quality Control Boards (RWQCB). The SFRWQCB has established regulatory standards and objectives for water quality for local surface water bodies. Under Porter-Cologne, the SFRWQCB may choose to regulate discharges of dredge or fill material by issuing or waiving Waste Discharge Requirements (WDRs). Public notice and an opportunity to comment are part of the SFRWQCB's process for issuing a WDR. All discharges associated with the proposed project would be in compliance with SFRWQCB requirements.

401 Water Quality Certification

The SFRWQCB can require a project proponent to obtain a Section 401 (Clean Water Act) water quality certification for Section 404 permits granted by the Corps. For wetland impacts that total less than one acre, the SFRWQCB typically issues a waiver, provided the applicant is also applying to the CDFG for an SAA, as described above. The SFRWQCB has 60 days to issue this waiver. For wetland impacts of one to two acres, a waiver could also be issued, but only after thorough review of any agency or public comments during the 40-day comment period on the Corps' issue notice (assuming that the Corps has required an individual permit). For more than two acres of wetland removal, the SFRWQCB requires a mitigation plan, a public hearing, and approval of the water quality certification by the State Water Resources Control Board.

Federal Endangered Species Act (Section 7 and 10)

The FESA (16 United States Code 1531 et seq.) requires formal consultation if a project involving a federal agency will result in the "taking" of a species currently listed as threatened or endangered. Section 9 of the act prohibits the "taking" of listed species. If a federal agency must issue a permit for the project (e.g., the Corps under the Clean Water act), then the project would be evaluated according to Section 7 of the FESA, which requires the two federal agencies to consult and resolve adverse effects to endangered species. If a listed species could be affected, a Biological Assessment would need to be prepared and submitted to the USFWS and/or NOAA Fisheries. After review of the Biological Assessment, the USFWS and/or NOAA Fisheries would issue a Biological Opinion, which could allow incidental take of protected species. If there is no other federal agency involvement, Zone 7 could be responsible for consulting directly with the USFWS and/or NOAA Fisheries regarding issues of "take" under Section 10 of the act, which could require preparation of a Habitat Conservation Plan.

Under USFWS, NOAA Fisheries, and CDFG policy, “species of special concern” are not subject to the same consultation requirements as listed endangered, rare, or threatened species. However, the agencies encourage informal consultation for species of special concern that may become officially listed before completion of the CEQA process.

U. S. Army Corps of Engineers

The Corps is the major agency involved in wetland regulation under Section 404 of the Clean Water Act (CWA). Section 404 regulates discharge of fill material into “waters of the United States,” which include wetlands. It is possible that the project could be permitted under the Corps’ Nationwide Permit program, which provides a streamlined process for select project categories. Authorization under a Nationwide Permit depends on whether the project would be consistent with specific conditions of the permit, such as the total acreage of wetlands or other waters of the U.S. (such as streams) affected by the project, and special-status species that may be adversely affected.

TABLE A.3.5-1
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE ZONE 7 STREAM MANAGEMENT MASTER PLAN

Common Name <i>Scientific Name</i>	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
ANIMALS				
Invertebrates				
Longhorn fairy shrimp <i>Branchinecta longiantenna</i>	FE/--	Vernal pools or other areas capable of ponding water seasonally	Moderate potential. Potential habitat occurs in the Springtown Preserve, though not documented in this area.	Year-round (eggs in dry season, adult shrimp in Winter)
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT/--	Vernal pools or other areas capable of ponding water seasonally	Present. Present in the Springtown Preserve (CDFG, 2005).	Year-round (eggs in dry season, adult shrimp in Winter)
Monarch butterfly <i>Danaus plexippus</i>	--/* (wintering sites)	Protected tree groves of eucalyptus, Monterey pine, and cypress with nearby nectar and water sources	Absent. Though such groves are present, this species is not known to breed in the Livermore-Amador Valley.	December-March
Curved-foot hygrotus diving beetle <i>Hygrotus curvipes</i>	FSC/--	Drainages, seeps, and wet areas; standing water in ponds or ephemeral pools	High potential. Habitat occurs in tributary freshwater and alkali streams in Reach 12.	February-March
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT/--	Riparian habitat, levee and rip rap lined stream banks containing its host plant, the elderberry (<i>Sambucus</i> sp.)	Absent. The Livermore-Amador Valley is beyond this subspecies' known range in the Central Valley.	Year round, breeding March-June
Bridges coast range shoulderband snail <i>Helminthoglypta nickliniana</i>	FE/--	Open hillsides of Alameda and contra Costa counties. Found in tall grass and weeds and/or rock piles.	Absent. Project is out of species' described range.	Year-round
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	FE/--	Vernal pools or other areas capable of ponding water seasonally	Low potential. Potential habitat is limited to the Springtown Preserve, though not documented from this area.	Year-round (eggs in dry season, adult shrimp in Winter)
Callippe silverspot butterfly <i>Speyeria callippe callippe</i>	FE/--	Coastal areas in dunes, prairie, scrub, and grasslands supporting johnny jump-ups	Low potential. Specific surveys would need to be conducted for verification, but no nearby occurrences are documented.	March-June
Amphibians				
California tiger salamander <i>Ambystoma californiense</i>	FT/CSC Proposed Critical Habitat	Wintering sites occur in grasslands occupied by burrowing mammals; breed in ponds and vernal pools	Present. Tributary streams and stock ponds in the eastern and southern valley provide suitable breeding habitat. If breeding habitat is available within 1.25 miles, salamanders may be potentially present in upland areas.	Winter rains and March-April
California red-legged frog <i>Rana aurora draytonii</i>	FT/CSC Proposed Critical Habitat	Breed in stock ponds, pools, and slow moving streams	Present. Documented from Altamont Creek, Arroyo las Positas, and the upper reaches of several smaller tributaries. Likely does not breed in the lower portions of major drainages such as Arroyo Mocho, Alamo Canal, and Arroyo de la Laguna.	May-August

TABLE A.3.5-1

SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE ZONE 7 STREAM MANAGEMENT MASTER PLAN

Common Name <i>Scientific Name</i>	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
Foothill yellow-legged frog <i>Rana boylei</i>	--/CSC	Breeds and overwinters in and near cobbled streams with permanent water	Low potential. Upstream portions of Arroyo Mocho may support this species; though potential is low downstream from the South Bay Aqueduct intersection.	December-May
Western spadefoot toad <i>Spea</i> (= <i>Scaphiopus</i>) <i>hammondi</i>	FSC/CSC	Freshwater seasonal marsh (primarily vernal pools for breeding), grasslands, and oak savanna	Absent. Habitat for this species does not occur in the project area. Also, no occurrences are reported from the valley floor.	February-May
Fish				
Pacific lamprey <i>Lampetra tridentata</i>	FSC/--	Clear coastal streams with Bay access.	Present. Reported downstream from Sunol Dam (Buchan et al., 1999).	year-round
Steelhead- Central California Coast ESU <i>Oncorhynchus mykiss irideus</i>	FT/--	Drainages of San Francisco and San Pablo Bays, central Calif. Coastal drainages	See separate fisheries section of this EIR for analysis.	year-round, migrating October-June
Reptiles				
Western pond turtle <i>Emys</i> (= <i>Clemmys</i>) <i>marmorata marmorata</i>	FSC/CSC	Lakes, ponds, reservoirs, and slow-moving streams and rivers, primarily in foothills and lowlands	Present. Observed in Altamont Creek, upper Arroyo las Positas, and may potentially occur throughout the SMMP area.	year-round
San Joaquin whipsnake <i>Masticophis flagellum ruddocki</i>	FSC/CSC	Open grassland, pasture and alkali scrub	Moderate potential. Rural grassland and pastureland in the valley foothills (Reach 12) provide suitable habitat. This species is likely absent from the valley floor.	March-October
Alameda whipsnake <i>Masticophis lateralis euryxanthus</i>	FT/CT	Coastal ranges, in chaparral and riparian habitat and adjacent grasslands	Absent. Habitat for this species does not occur on the valley floor.	March- November
California horned lizard <i>Phrynosoma coronatum frontale</i>	--/CSC	Valley woodland, coniferous forest, riparian, and grassland habitats; most commonly in sandy washes with scattered shrubs	Moderate potential. One CNDDDB record in project area vicinity, about 5 miles north of Brushy Creek segment; potential habitat at the Springtown Alkali Preserve.	
Giant garter snake <i>Thamnophis gigas</i>	FT/CT	Grassy banks and emergent, herbaceous wetland vegetation; drainage canals, sloughs, ponds, and low gradient streams	Absent. The Livermore-Amador Valley does not provide habitat for this species and is outside the species' described range.	March- September
Birds				
Cooper's hawk <i>Accipiter cooperii</i>	--/CSC (nesting)	Nests in dense oak and riparian woodland	Moderate potential. Wooded riparian areas in many major streams provide suitable nesting habitat.	year-round
Sharp-shinned hawk <i>Accipiter striatus</i>	--/CSC (nesting)	Nests in dense stands of conifers and riparian habitats	Moderate potential. Wooded riparian areas in many major streams provide suitable nesting habitat.	year-round
Tricolored blackbird <i>Agelaius tricolor</i>	FSC/CSC	Nests in freshwater marshes with dense stands of cattails or bulrushes, occasionally in willows, thistles, mustard, blackberry brambles, and dense shrubs and grains	Moderate potential (nesting). Breeding tricolored blackbird colonies have been seen in the surrounding foothills, generally east of Livermore. This species has a low to moderate potential to breed on the valley floor.	year-round
Golden eagle <i>Aquila chrysaetos</i>	--/CSC	Nests in canyons and large trees in open habitats	Moderate potential. Eagles may nest in rural grassland areas with eucalyptus stands or other large trees.	year-round

TABLE A.3.5-1

SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE ZONE 7 STREAM MANAGEMENT MASTER PLAN

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
Burrowing owl <i>Athene cunicularia</i>	--/CSC (burrowing sites)	Nests and forages in low-growing grasslands with burrowing mammals	High potential. Individual owls have been identified near the Livermore airport and near realigned Arroyo las Positas at Vasco Road. Nesting potential is moderate to high in rural grassland areas beyond the city boundaries.	year-round
Great blue heron <i>Ardea herodias</i>	--/* (nesting)	Colonial nester in tall trees near wetland foraging areas	Moderate potential. The project area provides suitable foraging habitat in several perennial drainages and near the quarry ponds. A single nesting colony is documented in the Niles Valley.	year-round
Swainson's hawk <i>Buteo swainsoni</i>	--/CT (nesting)	Nests in large trees, often near water, open grasslands or agricultural lands.	Absent. No nesting records for this species in project area; nesting considered unlikely.	March-July
White-tailed kite <i>Elanus leucurus</i>	--/*	Nests in shrubs and trees adjacent to grasslands, forages over grasslands and agricultural lands	Unknown. Areas in the project vicinity provide suitable nesting habitat; nesting suspected adjacent to Dyer Canal.	year-round
California horned lark <i>Eremophila alpestris actia</i>	--/CSC	Nests and forages in short-grass prairie, mountain meadow, coastal plain, fallow fields, and alkali flats	Moderate potential. Grasslands near project components provide potential habitat; though presence is not known.	March-July
American peregrine falcon <i>Falco peregrinus anatum</i>	FD/CE	Forages in marshes and grasslands. Nesting habitat includes high, protected cliffs and ledges near water	Absent. The project area does not provide suitable nesting habitat and only limited foraging habitat is available for this species.	May-August
Bald eagle <i>Haliaeetus leucocephalus</i>	FT/CE	Winter foraging at lakes and along major rivers	Absent. No suitable nesting or foraging habitat occur for this species. Breeding reported from Del Valle Reservoir and Los Vaqueros, though these areas are outside of the project impact area.	August-January
Loggerhead shrike <i>Lanius ludovicianus</i>	FSC/CSC	Scrub, open woodlands, and grasslands	Moderate potential. Shrike nesting is not known; nesting sites are limited elsewhere due to lack of breeding sites in open grasslands.	year-round
California black rail <i>Laterallus jamaicensis coturniculus</i>	FT/--	Brackish water and freshwater emergent wetlands	Absent. Project area lacks suitable breeding habitat.	
Mammals				
Townsend's western big-eared bat <i>Corynorhinus townsendii townsendii</i>	FSC/CSC	Oak and coniferous woodland and arid grasslands. Roosts in caves, buildings, etc.	Low to Moderate potential. Roosting habitat available in large diameter oaks and sycamores. No CNDDDB records in project vicinity.	April-October
Berkeley kangaroo rat <i>Dipodomys heermanni berkeleyensis</i>	--/--	Grassy openings and hilltops in chaparral and blue oak/gray pine woodland.	Low potential. Species is presumed extinct.	year-round
San Joaquin pocket mouse <i>Perognathus inornatus inornatus</i>	FSC/--	Grassland or scrub areas in loose soils from 1,000 to 2,000 ft.	Moderate potential. Suitable habitat along much of project alignment but only recorded sighting is reported from the project vicinity well north of project northern terminus.	year-round
Greater western mastiff bat <i>Eumops perotis californicus</i>	FSC/CSC	Breeds in rugged, rocky canyons and forages in a variety of habitats	Low to Moderate potential. Roosting habitat available in large diameter oaks and sycamores. No CNDDDB records in project vicinity.	February-August
Small-footed myotis bat <i>Myotis [ciliolabrum] leibii</i>	FSC/--	Forages over grasslands and roosts in caves and rock crevices	Low to Moderate potential. Roosting habitat available in large diameter oaks and sycamores. No CNDDDB records in project vicinity.	February-August
Long-eared myotis bat <i>Myotis evotis</i>	FSC/--	Inhabits woodlands and forests up to approximately 8,200 feet in elevation; generally not in Central Valley.	Low to Moderate potential. Roosting habitat available in large diameter oaks and sycamores. No CNDDDB records in project vicinity.	February-August

TABLE A.3.5-1

SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE ZONE 7 STREAM MANAGEMENT MASTER PLAN

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
Fringed myotis bat <i>Myotis thysanodes</i>	FSC/--	Inhabits a variety of habitats including pinyon-juniper woodland, valley-foothill hardwood, hardwood-conifer forests, and desert scrub; generally not in Central Valley.	Low potential. Roosting habitat available in large diameter oaks and sycamores. No CNDDDB records in project vicinity.	February-August
Long-legged myotis bat <i>Myotis volans</i>	FSC/--	Inhabits forests and woodland habitats, primarily oak and juniper woodlands	Low to Moderate potential. Roosting habitat available in large diameter oaks and sycamores. No CNDDDB records in project vicinity.	February-August
Yuma myotis bat <i>Myotis yumanensis</i>	FSC/--	Open forests and woodlands below 8,000 feet in close association with water bodies	Low potential. Project area is considered outside this species' range.	February-August
San Francisco dusky-footed woodrat <i>Neotoma fuscipes annectens</i>	FSC/CSC	Forests with moderate canopy cover and brushy understory	Moderate potential. Suitable habitat occurs in Alameda Creek, Arroyo de la Laguna, the South Tributary, and along other wooded streams in the SMMP area.	year-round
San Joaquin kit fox <i>Vulpes macrotis mutica</i>	FE/CT	Annual grasslands or grassy open areas with shrubs, loose-textured soils for burrows and prey base	Moderate to high potential. Project area provides suitable grazed grasslands habitat for this species. Project area is within the range of this species.	year-round
PLANTS				
Bent-flowered fiddleneck <i>Amsinckia lunaris</i>	FSLC/--/1B	Coastal bluff scrub, woodland, grassland	Low potential. Only occurrence in SMMP project area is from Altamont quad (CNPS, 2003). Grasslands in the SMMP project area generally dominated by non-native species, precluding many native species.	March-June
large-flowered fiddleneck <i>Amsinckia grandiflora</i>	FE/CE/1B	Grasslands; only native population is at LBNL.	Low potential. Although the species has been introduced at several sites there is only one known extant natural population, in the foothills to the south of the SMMP project area	March-June
Mt. Diablo manzanita <i>Arctostaphylos auriculata</i>	--/--/1B	Chaparral on sandstone substrate	Absent. The range of this species has been well defined and does not include the SMMP project area.	Year-round
Contra Costa manzanita <i>Arctostaphylos manzanita</i> ssp. <i>laevigatas</i>	--/--/1B	Rocky soils in chaparral	Absent. The range of this species has been well defined and does not include the SMMP project area.	Year-round
Ferris's milk vetch <i>Astragalus tener</i> var. <i>ferrisiae</i>	FSC/--/1B	Meadows, grasslands; subalkali flats, usually in dry adobe soil	Low to moderate potential. May occur in suitable habitat throughout the project area	April-May
Alkali milk vetch <i>Astragalus tener</i> var. <i>tener</i>	FSC/--/1B	In poor draining low ground of alkali playa, grasslands and vernal pools; usually in dry adobe soil	Low potential. Although habitat is found within the SMMP project area, all Bay Area occurrences are thought to be extirpated (CNPS, 2003).	March-June
Heartscale <i>Atriplex cordulata</i>	FSC/--/1B	Chenopod scrub and sandy, alkaline grasslands	Low potential. SMMP project area is on western edge of known range for the species. May occur in suitable habitat throughout the project area.	April-October
Brittlescale <i>Atriplex depressa</i>	FSC/--/1B	Alkaline or clay grasslands, chenopod scrub, and playas; occasionally in riparian areas, marshes or vernal pools	Moderate potential. Documented as occurring in alkali grasslands at Altamont Creek (CDFG, 2005). May occur elsewhere in suitable habitat throughout the SMMP project area.	May-October
San Joaquin saltbush <i>Atriplex joaquiniana</i>	FSC/--/1B	Alkaline seasonal wetlands and sinks in grasslands, chenopod scrub and alkali meadows	Moderate potential. Identified in alkali grasslands at Altamont Creek (CDFG, 2005).). May occur elsewhere in suitable habitat throughout the SMMP project area.	April-October

TABLE A.3.5-1

SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE ZONE 7 STREAM MANAGEMENT MASTER PLAN

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
Big-scale balsamroot <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	FSLC/--/1B	Woodland and grasslands, sometimes on serpentine soils	Low potential. Known from Livermore and Altamont quads (CNPS, 2005). May occur in suitable habitat throughout the SMMP project area.	March-June
Big tarplant <i>Blepharizonia plumosa</i> ssp. <i>plumosa</i>	FSC/--/1B	In annual grasslands of dry hills and plains; soils are clay to clay-loam; often found in burned areas and usually on slopes	Low potential. Known from Livermore and Altamont quads (CNPS, 2005). May occur in suitable habitat throughout the SMMP project area.	July-October
Mt. Diablo fairy-lantern <i>Calochortus pulchellus</i>	FSLC/--/1B	Valley and foothill grasslands, chaparral, cismontane woodland, riparian woodland	Low potential. Not documented in the SMMP project area (CNPS, 2005). May occur in suitable relatively undisturbed habit within the project area.	April-June
Congdon's tarplant <i>Centromadia parryi</i> ssp. <i>congdonii</i>	FSC/--/1B	Alkaline soils in grasslands	Low to moderate potential. Documented throughout the SMMP project area (CNPS, 2005)	June-November
Hispid bird's-beak <i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	FSC/--/1B	Seasonal wetlands in alkali sinks with valley sink scrub, alkali meadows, and alkali marsh communities	Low potential. Known occurrences within the SMMP project area are in the Springtown Reserve (CDFG, 2005).	June-September
Palmate-bracted bird's beak <i>Cordylanthus palmatus</i>	FE/CE/1B	Usually on silty, alkaline clays in chenopod scrub and grasslands; tends toward wetter areas (meadows, seeps, seasonal wetlands)	Present. Known occurrences within the SMMP project area occur in the Springtown Natural Community Reserve (CDFG, 2005).	May-October
Livermore tarplant <i>Deinandra baccigalupii</i>	FSC/--/1B	Alkali meadows	Low potential. CNPS note of occurrence in Altamont quad (CNPS, 2005). May occur in other suitable habitat within the SMMP project area.	June-October
Hospital Canyon larkspur <i>Delphinium californicum</i> ssp. <i>interius</i>	FSC/--/1B	Chaparral and moist areas in cismontane woodlands	Low potential. Species not documented from project area (CNPS, 2005) and suitable habitat is not present throughout most of the SMMP project area	April-June
Recurved larkspur <i>Delphinium recurvatum</i>	FSC/--/1B	On alkaline soils mostly in saltbush scrub and chenopod scrub but also grasslands and woodland.	Low potential. Known occurrences are north of SMMP project area. May occur in suitable habitat within the project area.	March-May
Mt. Diablo buckwheat <i>Eriogonum truncatum</i>	--/--/1A	Dry slopes of coastal scrub, chaparral, grasslands habitats; on exposed clay to sandy soils	Low potential. Species is thought to be extinct. Species not documented historically from Alameda County (CNPS, 2005).	April-November
Round-leaved filaree <i>Erodium macrophyllum</i>	--/--/2	On clay soils in woodland and grasslands	Low potential. May occur in suitable habitat throughout project area.	March-May
Hoover's button-celery <i>Eryngium aristulatum</i> var. <i>hooveri</i>	FSC/--/1B	Vernal pools	Low potential. Nearest occurrence noted in Milpitas quad (CNPS, 2003). Very little suitable habitat remains within the SMMP project area.	July
Diamond-petaled poppy <i>Eschscholzia rhombipetala</i>	FSC/--/1B	On grassland slopes and flats; substrate clay and alkaline	Low potential. May occur in suitable habitat throughout the SMMP project area.	March-April
Fragrant fritillary <i>Fritillaria liliacea</i>	FSC/--/1B	Coastal prairie and scrub, grasslands, often on serpentine soils	Unknown, but presumably low potential. Portions of Reach 12 remain unsurveyed and may support this species.	February-April
Diablo helianthella <i>Helianthella castanea</i>	FSC/--/1B	Forest, woodland, chaparral, coastal scrub, riparian woodland, and grassland; usually in chaparral/oak woodland ecotone.	Low potential. Only location referenced near project is in Byron Hot Springs quad. Project segments here do not contain preferred habitat for this species.	April-June

TABLE A.3.5-1

SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE ZONE 7 STREAM MANAGEMENT MASTER PLAN

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
Brewer's western flax <i>Hesperolinon breweri</i>	FSC/--/1B			
Contra Costa goldfields <i>Lasthenia conjugens</i>	FE/--/1B	Vernal pools and seasonal wetlands in grassland and woodland	Low potential. Extirpated from Byron Hot Springs quad (CDFG, 2005); extant population in Milpitas quad. Project area is believed to contain no suitable habitat.	March-June
Legenere <i>Legenere limosa</i>	--/--/1B	Vernal pools	Low potential. No documented occurrences from Alameda or Contra Costa Counties. However, species is documented from surrounding counties. Very little suitable habitat remains within the SMMP project area.	
Woolly-headed lessingia <i>Lessingia hololeuca</i>	--/--/3	On clay, serpentinite soils in broadleaf forest, coastal scrub, coniferous forest and grassland	Low potential. Not documented from Alameda or Contra Costa Counties. Known distribution of the species is primarily to the west of the project area (CNPS, 2005)	June-October
Hall's bush mallow <i>Malacothamnus hallii</i>	FSLC/--/1B	Chaparral and coastal scrub	Low potential. Not documented from Alameda County but occurrences noted from surrounding counties to east, north, and south (CNPS, 2005). Little suitable habitat present in project area.	May-September
Little mouseltail <i>Myosurus minimus</i> ssp. <i>apus</i>	FSC/--/3	In alkaline vernal pools in grassland	Low potential. CNPS (2005) notes occurrences in Clifton Court and Altamont quads. Only potential habitat is from the vicinity of Springtown.	March-June
Prostrate navarretia <i>Navarretia prostrata</i>	FSC/--/1B	In mesic, alkali areas of coastal scrub and grassland, particularly vernal pools	Low potential. Only occurrence in vicinity was in Milpitas quad, from which it has been extirpated (CNPS, 2003). Suitable habitat absent from project area.	April-July
Hairless popcornflower <i>Plagiobothrys glaber</i>	FSC/--/1A	Alkaline wetlands in valleys; salt marshes	Low potential. Historic location just south of Livermore. Believed to be extirpated from Alameda and Santa Clara counties (CNPS, 2003). Suitable wetland alkali habitat restricted to the Springtown area.	March-May
Rayless ragwort <i>Senecio aphanactis</i>	--/--/2	Alkaline flats in woodland and coastal scrub	Low potential. One historic location from the project vicinity. Suitable habitat not found on stream corridors.	January-April
Most beautiful jewel-flower <i>Streptanthus albidus</i> ssp. <i>peramoenus</i>	FSC/--/1B	Ridges and slopes with chaparral, grassland and woodland; on serpentine outcrops	Low potential. Extant populations found in Sunol Regional Park and near Mission Peak. Project segments pass near to these areas but contain no suitable serpentine habitat.	April-June
Saline clover <i>Trifolium depauperatum</i> var. <i>hydrophilum</i>	FSC/--/1B	Vernal pools and seasonal wetlands in grassland; also in freshwater marsh	Low potential. CNPS (2003) notes occurrences in Livermore and Altamont quads. Only potential habitat along project alignment in this area is in the Altamont pipeline segment.	April-June
Caper-fruited <i>tropidocarpum</i> <i>Tropidocarpum capparideum</i>	FSC/--/1A	Grasslands in alkaline hills	Low potential. Numerous historic locations near northern half of project route. Last seen in area in 1957. Species is believed to be extinct (CNPS, 2003)	March-April

STATUS CODES:

FEDERAL: (U.S. Fish and Wildlife Service)

FE = Listed as Endangered (in danger of extinction) by the Federal Government.

FT = Listed as Threatened (likely to become endangered within the foreseeable future) by the Federal Government.

FP = Proposed for Listing as Endangered (FPE) or Threatened (FPT).

TABLE A.3.5-1

SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE ZONE 7 STREAM MANAGEMENT MASTER PLAN

Common Name <i>Scientific Name</i>	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
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FC = Candidate to become a *proposed* species.

FSC = Federal Species of Concern. May be endangered or threatened, but not enough biological information has been gathered to support listing at this time.

FSLC = Federal Species of Local Concern.

FD = Delisted by the Federal Government

STATE: (California Department of Fish and Game)

CE = Listed as Endangered by the State of California

CT = Listed as Threatened by the State of California

CR = Listed as Rare by the State of California (plants only)

CSC = California Species of Special Concern

* = Special Animals

3503.5=Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls)

California Native Plant Society

List 1A=Plants presumed extinct in California

List 1B=Plants rare, threatened, or endangered in California and elsewhere

List 2= Plants rare, threatened, or endangered in California but more common elsewhere

List 3= Plants about which more information is needed

List 4= Plants of limited distribution

SOURCE: CDFG, 2005; USFWS, 2003, 2004; CNPS, 2003; ESA File Data.

TABLE A.3.5-2
AVAILABLE HABITAT FOR SPECIAL-STATUS SPECIES IN THE SMMP BY PROJECT REACH

Project Number	Description of Habitat in the Project Area	Potential Special-status Species ¹
REACH 1		
R.1-1	Proposed Springtown trail system improvements would traverse 250 feet of annual grasslands, alkali grasslands, and alkali sink communities; a trail would link Laughlin Road and Brushy Peak/Del Valle Trail, mainly affecting annual grasslands habitat; a sediment basin would be built within the alkali meadow and freshwater emergent areas in Altamont Creek that support emergent wetlands vegetated with cattails (<i>Typha</i> sp.); stream desiltation is proposed in the concrete portion of Altamont Creek downstream from Vasco Road.	VPFS, CRLF, CTS, WPT, AWS, LOSH, BUOW, MBTA, Raptors, SJKF, Alkali Plants
R.1-2	As a habitat enhancement project, proposed alkali sink management activities would divert freshwater flows from Altamont Creek into the Springtown Natural Community Reserve. An unknown amount of alkali meadow habitat would be affected. A 100-foot buffer around the SNCR would be dedicated and would include annual grasslands, alkali grasslands, and alkali meadow communities.	VPFS, CRLF, CTS, WPT, LOSH, BUOW, MBTA, Raptors, SJKF, Alkali Plants
R.1-3	The 1.84 acre-foot sediment basin and new bridge would partially displace a 2004/2005 habitat restoration project that mitigates 2003 sediment removal activities at this location. Due to 2003 grading, the narrow low-flow channel is vegetated with sparse sedges and other emergent freshwater marsh species; the seasonally flooded channel bottom supports a sparse perennial pepperweed (<i>Lepidium latifolium</i>) community; cismontane alkali marsh including iodine bush (<i>Allenrolfea occidentalis</i>) and saltgrass (<i>Distichlis spicata</i>) occupy the sparsely vegetated stream banks. Zone 7 initiated revegetation 2004 and it continues into 2005.	CRLF, WPT, LOSH, CAHR, MBTA, Alkali Plants
R.1-4	Instream management activities in Arroyo las Positas would reduce existing dense emergent cattail growth in a 3,500 foot stream section and presumably restore the channel to its design capacity. In 2003, ESA documented WPT and CRLF at the confluence of Arroyo las Positas and Altamont Creek (ESA, 2004b). The project may have long-term habitat quality impacts to CRLF and WPT.	CRLF, WPT, MBTA, Raptors

¹ Key to species acronyms: VPFS = Vernal pool fairy shrimp; CRLF = California red-legged frog; CTS = California tiger salamander; WPT = western pond turtle; AWS = Alameda whipsnake; LOSH = loggerhead shrike; BUOW = western burrowing owl; CAHR = California horned lark; MBTA = breeding birds protected by the Migratory Bird Treaty Act, including neotropical migrants; SJKF = San Joaquin kit fox; Alkali Plants = special-status rare plants associated with alkali soils (see Table A.3.5-1).

TABLE A.3.5-2
AVAILABLE HABITAT FOR SPECIAL-STATUS SPECIES IN THE SMMP BY PROJECT REACH

Project Number	Description of Habitat in the Project Area	Potential Special-status Species¹
R.1-5	Cattle grazing has displaced the native alkali meadow/marsh habitat from the stream, and stream banks are dominated by non-native annual grasslands. The stream channel supports a diverse series of pools interspersed by dense cattail growth and could benefit from bank restoration, while special-status amphibians would benefit from the creation of additional breeding habitat in a 0.6-acre pond. The 0.8-mile trail is setback from the creek in annual grasslands to minimize wildlife impacts.	CRLF, WPT, LOSH, CAHR, MBTA, BUOW, Raptors, Alkali Plants
R.1-6	This project combines habitat creation, bank stabilization, grade control features, and recreation trail creation to enhance a segment of Arroyo las Positas. This segment of stream is characterized by sparse to dense willow and cattail growth along a perennial channel. Banks are mostly non-native grasslands, though portions have been planted with native vegetation as a CRLF mitigation element. Off-channel wetlands would benefit native wildlife, including special-status amphibians.	CRLF, WPT, LOSH, MBTA, Raptors
R.1-7	This channel widening project would remove cattail vegetation from a 500-foot reach of Arroyo las Positas west of Vasco Road. In this area, Arroyo las Positas is a channelized stream that supports CRLF and possibly WPT (CDFG, 2005), and serves as a migration corridor to the extensive CRLF populations in Arroyo las Positas located south of Interstate 580 (CDFG, 2005). Bank repair and trail elements would have minimal effects to biological resources; channel widening would temporarily eliminate habitat for these species.	CRLF, WPT, MBTA
REACH 2		
R.2-1	In this area, Arroyo las Positas is a roughly 6- to 10-foot wide channel that supports water cress, water smartweed, and cattails. Bank vegetation consists of non-native annual species including bristly ox tongue and wild oats. CRLF may breed in this stream reach with an estimated population of several hundred frogs in the area. WPT habitat is present in this stream as well. Potential BUOW nesting habitat occurs along channel banks.	CRLF, WPT, LOSH, BUOW, MBTA, Raptors
R.2-2	Conditions are similar to site R.2-2, though CRLF and WPT have not been documented from the project area. BUOW are unlikely at this site due to surrounding development.	CRLF, WPT, LOSH, MBTA Raptors
R.2-3	Conditions are similar to site R.2-2, though CRLF and WPT have not been documented from the project area. BUOW are unlikely at this site due to surrounding development.	CRLF, WPT, LOSH, MBTA, Raptors

TABLE A.3.5-2
AVAILABLE HABITAT FOR SPECIAL-STATUS SPECIES IN THE SMMP BY PROJECT REACH

Project Number	Description of Habitat in the Project Area	Potential Special-status Species¹
REACH 3		
R.3-1	A turnout already exists at the proposed location. Any improvements would affect a limited amount of mule fat scrub in an otherwise seasonally dry portion of Arroyo Mocho.	CRLF, WPT, MBTA, Raptors, BATS ²
R.3-2	The creation of a sediment basin and constructed wetlands is likely to benefit common wildlife species. CRLF may be absent from the local vicinity but should be considered present until completion of focused surveys. The created habitat and sediment basin may benefit non-native bullfrogs. This project will result in a net increase in wetlands habitat and native habitat along the stream.	CRLF, WPT, MBTA, Raptors, BATS
R.3-3	New earthen levees would be located in primarily upland areas that support scrub habitat and annual grasslands, though some riparian vegetation could be affected, and would be replanted with native species.	CRLF, WPT, MBTA, Raptors, BATS
R.3-4	Principally a flood control project, levee construction would remove mature woody riparian vegetation on both banks along an 0.33-mile segment of Arroyo Mocho. This shallow, warm, slow-moving portion of the creek supports native warm-water fish and common native amphibian and reptile species. The uniform shallow stream bottom and general lack of instream cover provide poor habitat for CRLF and WPT, which have not been identified from this area.	CRLF, WPT, MBTA, Raptors, BATS
R.3-5	Removal of the fish barrier at Stanley Blvd. would improve fisheries habitat (see Section 3.6) and not substantially affect biological resources. The railroad bridge at Stanley Blvd. may provide roosting habitat for special-status bats.	CRLF, WPT, MBTA, Raptors, BATS
REACH 4		
R.4-1	Both Arroyo del Valle and South Tributary support a dense native riparian woodland community dominated by western sycamore, valley oak, willows, and scrub vegetation.	CRLF, WPT, CTS, MBTA, Raptors, BATS, SFDWR
R.4-2	Proposed activities for Project R.4-2 are located in annual grasslands near riparian habitats and need to consider potential presence of CTS and CRLF in upland areas, and WPT breeding sites.	CRLF, CTS, WPT, MBTA, Raptors, BATS

² Key to acronyms: BATS = special-status bats

TABLE A.3.5-2
AVAILABLE HABITAT FOR SPECIAL-STATUS SPECIES IN THE SMMP BY PROJECT REACH

Project Number	Description of Habitat in the Project Area	Potential Special-status Species¹
REACH 5		
R.5-1	This project would create 3 miles of recreational trails along Cottonwood Creek in Doolan Canyon; 4.5 miles along Collier Creek; and 5 miles along Cayetano Creek. Trails would traverse undeveloped mostly non-native annual grasslands habitat with occupied upland habitat that supports CTS and CRLF.	CTS; CRLF; WPT LOSH, BUOW, MBTA Raptors, Rare Plants ³
R.5-2	Arroyo las Positas upstream of Airway Blvd is a broad flood control channel dominated by cattails. This area provides potential breeding and summer habitat for CRLF, and is a potential migratory route for CRLF and WPT.	CRLF, WPT, MBTA, Raptors
R.5-3	The segment of Arroyo las Positas between Airway Blvd. and the Chain of Lakes supports a dense growth of mature arroyo willow (<i>Salix lasiolepis</i>) with sporadic cattail growth. The arroyo supports numerous instream habitats including deep water pools, riffles, and runs. It is likely that CRLF breed in available pool habitat with WPT breeding in uplands. The riparian corridor provides abundant breeding opportunities for native and migratory songbirds.	CRLF, WPT, MBTA
REACH 6		
R.6-1	Arroyo Mocho near the Chain of Lakes is a seasonally dry cobble bed stream with limited riparian vegetation. While portions of the stream are unvegetated, downstream areas support limited growth of cattails and intermittent willows. A dense eucalyptus grove lines both banks of this channelized stream along the length of the Chain of Lakes. Cope Lake is a massive excavated gravel mine that is partially filled with water. Surrounding vegetation includes annual grasslands and a sparse wetland fringe.	CRLF, BUOW, GBHE ⁴ , MBTA
R.6-2	The Arroyo Mocho Bypass would be excavated in annual grasslands that occur south of the Chain of Lakes and on levees between lakes. Portions of Arroyo Mocho that would be widened downstream from Cope Lake to the confluence with Arroyo las Positas are similar to conditions described above, with seasonally dry habitat and a dense eucalyptus canopy on both banks.	CRLF, MBTA
REACH 7		
R.7-1	The proposed 4.3 mile trail network would be constructed in annual grasslands habitat on the edges of Lakes A and B; the conveyance structure would be built in upland grassland areas and on existing levees and access roads around Lakes A and B, and along the southern edge of Lake C.	CRLF, WPT; MBTA, Raptors

³ Key to acronyms: Rare Plants = special-status plant species

⁴ Key to acronyms: GBHE = great blue heron (potential rookery habitat)

TABLE A.3.5-2
AVAILABLE HABITAT FOR SPECIAL-STATUS SPECIES IN THE SMMP BY PROJECT REACH

Project Number	Description of Habitat in the Project Area	Potential Special-status Species¹
R.7-2	Proposed trail connections would be built in developed areas with about 8,000 feet of new trail that would be built in uplands, mostly grassland, habitat.	CRLF, WPT; MBTA, Raptors, BATS
R.7-3	This biologically beneficial project would remove or modify three concrete fish barriers in lower Arroyo las Positas, create a 0.2-mile connecting trail through an off-channel residential area, replace various flap gates and presumably armor banks at a limited number of locations, manage non-native vegetation in areas where it is problematic, and plant native riparian vegetation as necessary in areas downstream from Bernal Avenue.	PALA ⁵ , CRLF, WPT; MBTA, Raptors, BATS
REACH 8		
R.8-1	Tassajara Creek is a shallow, trapezoidal flood control channel with perennial flows. Emergent vegetation is limited to the channel edges and consists of sparse to moderately dense cattails. Banks are vegetated with non-native annual species. A large concrete apron at Arroyo Mocho limits fish and wildlife access from Arroyo Mocho into Tassajara Creek. Instream habitat has greater habitat functions and values north of I-580.	CRLF, WPT, MBTA
R.8-2	Chabot Canal is a shallow, trapezoidal flood control channel with perennial flows. Instream conditions are similar to those for project R.8-1. A large concrete apron at Arroyo Mocho limits fish and wildlife access into Chabot Canal from Arroyo Mocho. Canal widening could substantially improve habitat conditions in Chabot Canal if coupled with native revegetation.	CRLF, WPT, MBTA
R.8-3	Channel activities would modify a 17,000-foot stretch of Arroyo Mocho that presently provides abundant plant and wildlife benefits and serves as an important wildlife migration corridor. Channel grading would remove sediment and vegetation along the entire channel bottom and channel banks. These areas would be temporarily denuded for a number of years prior to the establishment and growth of native vegetation plantings.	PALA, CRLF, WPT, MBTA, Raptors
R.8-4	Channel activities would modify a 6,000-foot stretch of Arroyo de la Laguna that presently provides abundant plant and wildlife benefits and serves as an important wildlife migration corridor. Channel grading would remove sediment and vegetation along the entire channel bottom and channel banks. These areas would be temporarily denuded for a number of years prior to the establishment and growth of native vegetation plantings.	PALA, CRLF, WPT, MBTA, Raptors

⁵ Key to acronyms: PALA = Pacific lamprey

TABLE A.3.5-2
AVAILABLE HABITAT FOR SPECIAL-STATUS SPECIES IN THE SMMP BY PROJECT REACH

Project Number	Description of Habitat in the Project Area	Potential Special-status Species¹
REACH 9		
R.9-1	Channel activities would modify 0.9 mile Alamo Canal and South San Ramon Creek that presently support sparse growth of herbaceous, annual emergent vegetation such as cattails. These areas would be temporarily denuded for a number of years prior to the establishment and growth of native vegetation plantings.	PALA, CRLF, WPT, MBTA, Raptors
R.9-2	Roughly 5,000 l.f. of mostly denuded stream that supports ryegrass, wild oats, poison hemlock, and other non-native species would be lined with concrete.	MBTA
R.9-3	Line J-1 is a perennial, trapezoidal drainage dominated by sedges, rabbit's foot grass, and water smartweed. Floating algae covers the water surface during summer and fall months. Creek banks are a combination of concrete and earthen materials, with a natural stream bottom. 5,500 feet of channel that supports herbaceous, annual emergent vegetation would be converted to concrete-bottomed channel.	CRLF, WPT, MBTA, Raptors
R.9-4	Project activities would affect two box culverts and would not substantially impact the adjacent riparian woodland community or disrupt this seasonal stream.	CRLF, WPT, MBTA, Raptors
R.9-5	Activities would be conducted in a denuded area beneath I-580 and within non-native annual grasslands at the top of bank. Typical vegetation includes Italian thistle and wild oats.	CRLF, WPT, MBTA, Raptors
R.9-6	Stream grading along an 8,000 foot reach of Line G-1-1 would affect areas dominated by sedges, rabbit's foot grass, water smartweed, and cattails in deeper areas. Aquatic habitat would be affected upstream from Stoneridge Drive and would eliminate waterfowl breeding habitat and habitat for non-native turtles and bullfrog.	MBTA
R.9-7	Grading activities in Alamo Creek would remove sediment and sparse herbaceous, annual emergent vegetation along the entire channel bottom and channel banks. These areas would be temporarily denuded for a number of years prior to the establishment and growth of native vegetation plantings.	PALA, CRLF, WPT, MBTA, Raptors

TABLE A.3.5-2
AVAILABLE HABITAT FOR SPECIAL-STATUS SPECIES IN THE SMMP BY PROJECT REACH

Project Number	Description of Habitat in the Project Area	Potential Special-status Species¹
REACH 10		
R.10-1	Between Arroyo del Valle and Bernal Avenue, Arroyo de la Laguna is an earthen, trapezoidal stream with a single dirt maintenance road located beyond the riparian corridor on the west bank. Trail creation activities would use the existing maintenance road. Grading and terracing on the east bank would affect roughly 500 linear feet of sparse to dense riparian forest habitat. Instream bank protection devices would be installed on the banks and within the relatively uniform sandy-clay stream channel.	PALA, CRLF, WPT, MBTA, Raptors
R.10-2	This area has supports a dense riparian forest with boulder rip-rap bank protection located sporadically throughout its length. Vegetated terraces and bank stabilization would be done in areas that support native forest vegetation and some areas that are rock armored. Proposed trails would be located at the top of bank where many existing roads are already present. Portions of the trail would affect annual grasslands, riparian forest, and some coyote brush scrub. Several concrete structures would be upgraded or removed to promote fish passage (see Chapter 3.6).	PALA, CRLF, WPT, MBTA, Raptors
R.10-3	Like R.10-2, this area supports a dense riparian forest with extensive boulder rip-rap bank protection over major lengths of the stream. Rip-rapped areas generally do not support riparian vegetation. Rip-rap would be replaced in some areas (without incorporating vegetation) and modified in other to incorporate live planting stakes. A concrete structure would be upgraded or removed to promote fish passage.	PALA, CRLF, WPT, MBTA, GBHE, Raptors
R.10-4	Arroyo de la Laguna between Castlewood Drive and Verona Road supports riparian forest, sycamore riparian woodland and willow riparian habitat. This portion of the stream supports a broad unvegetated gravel floodplain, which further widens downstream of Verona Road. Though not specifically known, it is likely that bank stabilization activities would principally occur in the gravel floodplain, willow riparian habitat, and mulefat scrub habitats adjacent to the active stream channel.	PALA, CRLF, WPT, MBTA, GBHE, Raptors
R.10-5	The proposed 3.7 mile trail would likely wind through a savannah-like mature sycamore grove located above the top of bank. Conditions at this site are similar to those immediately upstream, with a broad unvegetated gravel floodplain that supports willow riparian habitat, and mulefat scrub. Bank stabilization activities may affect up to 4,000 linear feet of riparian forest habitat, sycamore riparian woodland, and willow riparian habitat.	PALA, CRLF, FYLF, WPT, MBTA, GBHE, Raptors

TABLE A.3.5-2
AVAILABLE HABITAT FOR SPECIAL-STATUS SPECIES IN THE SMMP BY PROJECT REACH

Project Number	Description of Habitat in the Project Area	Potential Special-status Species¹
REACH 11		
R.11-1	The proposed 2.4-mile trail would be outside of the immediate riparian zone, and would likely traverse grasslands through savannah like sycamore groves in the upstream portions of the project area near Arroyo de la Laguna, and would be located within and adjacent to riparian forest habitat (primarily on existing right-of-ways) in the downstream portions of this project area. Stream conditions outside of the steeper valley areas are similar to those in Arroyo de la Laguna; with a broad unvegetated gravel floodplain that supports willow riparian habitat, and mulefat scrub.	PALA, CRLF, FYLF, WPT, AWS ⁶ , MBTA, GBHE, Raptors, BATS
R.11-2	Sinbad Creek is a small, natural channel that supports mixed riparian woodland habitat.	CRLF, FYLF, AWS, WPT, MBTA, GBHE, Raptors, BATS
REACH 12		
R.12-1	The Patterson Run enhancement program would stabilize roughly 8,000 feet of stream bank, affecting aquatic habitat, willow riparian habitat, and adjacent annual grasslands.	CFHDB ⁷ , CRLF, CTS, MBTA, BUOW, SJKF
R.12-2	The Landowner Grant Program at Corral Hollow Creek would remove vegetation from within stream channel, affecting aquatic habitat, willow riparian habitat, and adjacent annual grasslands.	CFHDB, CRLF, CTS, MBTA, BUOW, SJKF

⁶ Key to species acronyms: AWS = Alameda whipsnake

⁷ Key to acronyms: CFHDB = curve-footed hygroty diving beetle

APPENDIX 3.6

Fisheries Resources

APPENDIX 3.6

FISHERIES RESOURCES

COUNTY AND LOCAL REGULATIONS, GOALS, AND POLICIES

Please refer to Appendix 3.5 Biological Resources for a discussion of county and local regulations, goals, and policies related to biological resources, including fisheries resources.

APPENDIX 3.7

Air Quality

APPENDIX 3.7

AIR QUALITY

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The goal, policies, and programs identified in the ECAP (amended November 2002) include the following:

Goal: To ensure that air pollution levels do not threaten public health and safety, economic development, or future growth.

Policy 291. The County shall strive to meet federal and state air quality standards for local air pollutants of concern. In the event that standards are exceeded, the County shall require appropriate mitigation measures on new development.

Policy 294. The County shall require new development projects to include traffic and air pollutant reduction measures to help attain air quality standards. For non-residential projects, these measures could include Transportation Demand Management programs such as ridesharing and transit promotion; for residential projects, these measures could include site plan features to reduce traffic trip generation such as mixed use development and transit-oriented development.

Policy 299. The County shall require projects that generate high levels of air pollutants, such as manufacturing facilities, hazardous waste handling operations, and drive-through restaurants and banks, to incorporate air quality mitigations in their design.

Policy 300. The County shall review proposed projects for their potential to generate hazardous air pollutants.

Program 107. The County shall include evaluation of hazardous air pollutant emissions in development review procedures of proposed land uses which may handle, store or transport lead, mercury, vinyl chloride, benzene, asbestos, beryllium, and other hazardous materials.

CITY OF PLEASANTON

The City of Pleasanton General Plan (1996) provides goals and policies associated with protection of air quality. Relevant goals and policies include:

Goal 1: To implement a pro-active approach and use available technology to maintain and improve air quality within Pleasanton and the region to protect the public health.

Policy 1. Adhere to Federal, State, regional, and local air quality standards, whichever is most stringent, for local pollutants of concerns

Policy 4. Review proposed projects for their potential to impact air quality conditions.

Program 4.1. Include air quality as a factor in the City's environmental review process. Encourage development plans which minimize negative impacts on air quality.

Program 4.2. Require projects which generate high levels of air pollutants, such as manufacturing facilities and hazardous waste handling operations, to incorporate air quality mitigations in their design.

CITY OF LIVERMORE

Relevant goals and policies from the City of Livermore General Plan 2003 – 2025 (2004) applicable to the proposed project include:

Objective OSC-1. Minimize air pollution.

Policy OSC-1.P1. The City shall require project developers to develop and implement a construction-period air pollution control plan, consistent with dust and emission-abatement actions outlined in the CEQA handbook of the Bay Area Air Quality Management District.

Policy OSC-1.P4. All industrial uses within Livermore shall meet regional, State, and federal air pollution standards.

CITY OF DUBLIN

The City of Dublin General Plan (2002) does not list any air quality policies or programs that would be applicable to the proposed project.

APPENDIX 3.8

Noise

APPENDIX 3.8

NOISE

Noise Regulations, Plans, and Policies

Federal Guidelines

The federal Noise Control Act of 1972 established a requirement that all federal agencies administer their programs to promote an environment free of noise that jeopardizes public health or welfare. EPA was given the responsibility for:

- providing information to the public regarding identifiable effects of noise on public health or welfare,
- publishing information on the levels of environmental noise that will protect public health and welfare within an adequate margin of safety,
- coordinating federal research and activities related to noise control, and establish federal noise emission standards for selected products distributed in interstate commerce.

EPA identified indoor and outdoor noise limits to protect against effects on public health and welfare. Outdoor limits of 55 dB- Ldn and indoor limits of 45 dB- Ldn are identified as desirable to protect against speech interference and sleep disturbance for residential areas and areas with educational and healthcare facilities. The U.S. Department of Housing and Urban Development has established guidelines for evaluating noise impacts on residential projects. Sites are generally considered acceptable if they are exposed to outdoor noise levels of 65 dB- Ldn or less, normally unacceptable if they are exposed to levels of 65– 75 dB- Ldn, and unacceptable if exposed to levels of 75 dB- Ldn or greater.

State Guidelines

Title 4, California Code of Regulations has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The State of California establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State pass-by standard is consistent with the federal limit of 80 dB. The State pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dB at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials. The State has also established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise.

Alameda County General Plan

In California, local regulation of noise involves implementation of General Plan policies and Noise Ordinance standards. Local General Plans identify general principles intended to guide and influence development plans, and Noise Ordinances set forth the specific standards and procedures for addressing particular noise sources and activities. **Table 3.8.1** provides yearly average sound levels required to protect the public health and welfare with an adequate margin of safety, as provided in the General Plan for Alameda County (1994).

The Noise Element of the East County General Plan also identifies noise/land use compatibility guidelines for development in the unincorporated portions of Alameda County and contains policies addressing community noise issues (Alameda County, 2002). For low density residential areas, the Noise Element compatibility guidelines indicate that noise levels up to 60 dBA, Ldn are normally acceptable, and noise levels up to 70 dBA, Ldn are conditionally acceptable.¹ For water recreation areas, the normally acceptable noise level is up to 75 dBA, Ldn.

Alameda County Noise Ordinance

Alameda County's Noise Ordinance, contained in Alameda County General Code, Title 6 Health & Safety, Chapter 6.60 Noise, establishes maximum exterior noise exposure standards for sensitive land uses, as well as commercial properties (Alameda County, 2003). The ordinance addresses noise using a system of noise criteria not to be exceeded based on the duration of noise over a given hour. **Table 3.8-2** summarizes the exterior noise standards applicable to the SMMP. Sections 6.60.070(E) and 6.60.070(G) of the noise ordinance exempt construction activities from the noise limits contained in **Table 3.8-2** provided that: 1) such activities are limited to between 7:00 a.m. to 7:00 p.m. on weekdays and between 8:00 a.m. and 5:00 p.m. on Saturdays and Sundays; and 2) equipment, including mufflers, used for construction activities are maintained in the condition for which it was designed or intended.

City of Pleasanton

The General Plan for the City of Pleasanton contains noise compatibility guidelines for land uses within the City (City of Pleasanton, 1996). For residential land uses, schools, libraries, museums, hospitals, personal care, meeting halls, and churches, a noise environment characterized by noise levels less than 60 dBA, DNL is considered normally acceptable. For parks and recreational areas, noise levels less than 65 dBA, DNL is considered normally acceptable, whereas for commercial and industrial uses, 70 dBA, DNL is considered normally acceptable. The City of Pleasanton (1996) recognizes that the goal of 60 DNL as a maximum outdoor noise level in residential areas "cannot necessarily be reached in all residential areas within the realm of economic or aesthetic feasibility, but that this goal should generally be applied where outdoor use is a major consideration (e.g., backyards in single-family housing projects and recreation areas in multi-family housing projects). Front yards can generally tolerate an DNL of up to 65 dB." The

¹ The East County General Plan defines "conditionally acceptable" as: new construction or development [that] should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice. "Normally acceptable" requires no special noise insulation.

Pleasanton General Plan also provides exceptions for pieces of equipment that generate less than 83 dBA at a distance of 25 feet during the daytime.

The City of Pleasanton Noise Regulation (9.04.010 – 9.04.110) provides noise limits for public property. Noise resulting from person, machine, animal, device, or any combination of these on these properties in residential, commercial, and industrial areas shall be limited 60 dBA, 70 dBA, and 75 dBA, respectively at a distance of 25 feet or more from the noise source or sources. (Section 9.04.060). The Noise Regulation provides an exception for these provisions for any noise in residential areas for which does not produce a noise level exceeding 70 dBA at a distance of 25 feet under its most noisy condition of use between the hours of 8:00 a.m. and 8:00 p.m., except Sundays and holidays (10:00 a.m. to 6:00 p.m.).

Exceptions are also provided during the daytime for construction activities (Section 9.04.070 and 9.04.100). Between 8:00 a.m. and 8:00 p.m., except Sundays and holidays (10:00 a.m. to 6:00 p.m.), construction, alteration or repair activities which are authorized by a valid city permit shall be allowed if they meet at least one of the following noise limitations: 1) No individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible; or 2) the noise level at any point outside of the property plane² of the project shall not exceed 86 dBA.

City of Livermore

The City of Livermore has adopted noise level guidelines for land uses within the City (City of Livermore, 2004). Normally acceptable noise levels for residential uses are 60 to 65 DNL or CNEL (dB) or below. Commercial uses, playgrounds and neighborhood parks with noise levels up to 70 DNL or CNEL (dB) are normally acceptable, whereas for industrial uses, up to 75 DNL or CNEL (dB) are normally acceptable. Noise levels less than 70 DNL or CNEL (dB) are conditionally acceptable³ for residential uses, transient lodging, schools, libraries, churches, hospitals, nursing homes, auditoriums, concert halls, and amphitheatres.

The Noise Element identifies techniques for noise control, which include: 1) sound proofing through construction; 2) attenuation through design; 3) attenuation by distance; and 4) provision of noise buffers.

The Livermore Municipal Code, Chapter 9.36, prohibits certain loud, disturbing, unusual, and unnecessary noise in order to safeguard the public health and safety. Relevant sections of the code include Section 9.36.070, which prohibits the creation of excessive noise on streets adjacent to schools, courts, churches, and hospitals. Section 9.36.080 prohibits the operation of noise-

² “Property plane,” defined in the City’s of Pleasanton’s Noise Regulations, means a vertical plane including the property line which determines the property boundaries in space.

³ The City of Livermore’s definition for “Conditionally Acceptable” is the same as that identified for the ECAP, above.

generating construction equipment (pile drivers, pneumatic hammers, derricks and similar equipment that produce loud or unusual noise) between the hours of 8:00 p.m. and 7:00 a.m.

City of Dublin

The City of Dublin has adopted noise level guidelines for land uses within the City (City of Dublin, 2004). Normally acceptable noise levels for residential uses are 60 DNL or CNEL (dB) or below. Commercial uses, playgrounds and neighborhood parks with noise levels up to 70 DNL or CNEL (dB) are normally acceptable, whereas for industrial uses, up to 70 DNL or CNEL (dB) are normally acceptable. Noise levels of 60-70 DNL or CNEL (dB) are conditionally acceptable for residential uses. Noise levels of 70-80 DNL or CNEL (dB) are conditionally acceptable for schools, churches, nursing homes 60 or less, and motels/hotels 60 or less.

The Noise Element identifies techniques for noise control, which include: 1) sound proofing through construction; 2) attenuation through design; 3) attenuation by distance; and 4) provision of noise buffers.

TABLE A.3.8.1
YEARLY AVERAGE* EQUIVALENT SOUND LEVELS IDENTIFIED AS
REQUISITE TO PROTECT THE PUBLIC HEALTH AND WELFARE WITH
AN ADEQUATE MARGIN OF SAFETY

	Measure	Indoor			Outdoor		
		Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects (b)	Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects (b)
Residential with Outside Space and Farm Residences	L _{dn}	45	-	45	55	-	55
	L _{eq(24)}	-	70	-	-	70	-
Residential with No Outside Space	L _{dn}	45	-	45	-	-	-
	L _{eq(24)}	-	70	-	-	-	-
Commercial	L _{eq(24)}	(a)	70	70(c)	(a)	70	70(c)
Inside Transportation	L _{eq(24)}	(a)	70	(a)	-	-	-
Industrial	L _{eq(24)(d)}	(a)	70	70(c)	(a)	70	70(c)
Hospitals	L _{dn}	45		45	55	-	55
	L _{eq(24)}	-	70	-	-	70	
Educational	L _{eq(24)}	45	-	45	55	-	55
	L _{eq(24)(d)}	-	70	-	-	70	
Recreational Areas	L _{eq(24)}	(a)	70	70(c)	(a)	70	70(c)
Farm Land and General Unpopulated Land	L _{eq(24)}	-	-	-	(a)	70	70(c)

CODES:

- Since different types of activities appear to be associated with different levels, identification of a maximum level for activity interference may be difficult except in those circumstances where speech communication is a critical activity. (See Figure D-2 for noise levels as a function of distance which allow satisfactory communication.)
- Based on lowest level.
- Based only on hearing loss.
- An L_{eq(8)} of 75 dB may be identified in these situations so long as the exposure over the remaining 16 hours per day is low enough to result in a negligible contribution to the 24-hour average, i.e., no greater than an L_{eq} of 60 dB.

NOTE: Explanation of identified level for hearing loss: The exposure period which results in hearing loss at the identified level is a period of 40 years.

*Refers to energy rather than arithmetic averages.

SOURCE: USEPA Office of Noise Abatement and Control, 1974; Alameda County General Plan 1994.

TABLE A.3.8-2
ALAMEDA COUNTY NOISE ORDINANCE STANDARDS (EXTERIOR)^{a,b,c}

Cumulative Number of Minutes in any one hour time period	<u>Noise Level Standards (dBA)</u>	
	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
30	50	45
15	55	50
5	60	55
1	65	60
0	70	65

- ^a These standards apply when the receiving land use includes single- or multiple-family residential, school, hospital, church or public library properties. The noise ordinance also has noise standards that apply to commercial properties that are 15 dBA higher for each period of time.
- ^b In the event the measured ambient noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted so as to equal said ambient noise level.
- ^c The ordinance also states that the standards identified in this table shall be reduced by 5 dBA for impulsive or simple tone noises, or for noises consisting primarily of speech or music. "Impulsive noise" means a noise characterized by brief excursion of sound pressures whose peak levels are very much greater than the ambient noise level, such as might be produced by the impact of a pile driver, punch press or drop hammer, typically with a duration of one second or less. "Simple tone noise" means a noise characterized by the presence of a predominant frequency or frequencies such as might be produced by a whistle or hum.

SOURCE: Alameda County General Code, 2003, Title 6 Health & Safety, Chapter 6.60 Noise, Section 6.60.040.

APPENDIX 3.9

Traffic and Circulation

APPENDIX 3.9

TRAFFIC AND CIRCULATION

COUNTY AND LOCAL REGULATIONS, GOALS, AND POLICIES

The policies that relate to short-term traffic impacts during construction are described below by jurisdiction.

Alameda County

East County Area Plan (1994)

Goal. To reduce East County traffic congestion.

Policy 169. The County shall seek to minimize traffic congestion levels throughout the East County street and highway system.

Policy 170. The County shall seek to minimize the total number of average daily trips throughout East County.

City of Livermore

City of Livermore General Plan (2004)

Goal Provide a local roadway system for the safe, efficient, and convenient movement of vehicular traffic

Policy P1 The City shall maximize the carrying capacity of major streets by providing a well coordinated traffic/signal system, controlling the number of intersections and driveways, limiting residential access points, and requiring sufficient off-street parking

Policy P2 The City shall ensure that adequate roadway connections are provided between areas north of I-580 and areas south of I-580

Policy P3 The City shall pursue and protect adequate right-of-way to accommodate future roadway system improvements.

City of Dublin

City of Dublin General Plan (Last Amended: 2002)

Policy 5.1.2.R. Provide an additional interchange on I-680 north of I-580 to provide better access to the downtown area.

Policy 5.1.2.S. Improve I-580 interchanges to serve planned growth.

Policy 5.2.B. Support improved local transit as essential to a quality urban environment, particularly for residents who do not drive.

Policy 5.2.D. Support the development of a community that facilitates and encourages the use of local and regional transit systems.

Policy 5.3.B. Consider potential recreational use in conjunction with transportation use

Policy 5.4.A. Provide safe bikeways along arterials (See Figures 5-3a and 5-3b).

Policy 5.4.B. Complete the bikeway systems illustrated on Figures 5-3a and 5-3b.

Policy 5.6.A. Incorporate County-designated scenic routes, and the proposed Fallon Road extension, in the General Plan as adopted City-designated scenic routes, and work to enhance a positive image of Dublin as seen by through travelers.

Policy 5.6.B. Exercise design review of all projects visible from a designated scenic route.

City of Pleasanton

City of Pleasanton General Plan (1996)

Goal 1 To develop a safe, convenient and uncongested circulation system.

Policy 3 Facilitate the free flow of vehicular traffic on major arterials.

Policy 4 Design and regulate City streets to minimize traffic-related impacts on adjacent land uses.

Policy 6 Maximize traffic safety for automobile, transit, bicycle users, and pedestrians.

Policy 7 Require adequate on and off-street parking.

Policy 8 Phase transit improvements to meet the demand for existing and future development.

Policy 9 Reduce the total number of Average Daily Traffic (ADT) trips throughout the City.

Policy 12 Encourage the extension of BART from Pleasanton to Livermore following the I-580 alignment.

Policy 16 Create and maintain a safe and convenient pedestrian system which encourages walking as an alternative to driving.

APPENDIX 3.10

Hazardous Materials

APPENDIX 3.10

HAZARDOUS MATERIALS

To protect public health and the environment federal, state, and local governments extensively regulate hazardous materials and hazardous wastes. In general, these regulations provide definitions of hazardous substances; establish reporting requirements; set guidelines for handling, storage, transport, remediation, and disposal of hazardous wastes; and require health and safety provisions for both workers and the public. Regulatory agencies also maintain lists, or databases, of sites that are permitted to handle hazardous wastes or store hazardous substances in underground storage tanks as well as sites where soil or groundwater quality may have been affected by hazardous substances.

Federal Lists

The federally published lists of sites that trace the status of suspected hazardous materials sites or identify sites permitted to generate hazardous wastes, and that were reviewed as part of this analysis, include the following:

- National Priority List, which prioritizes sites with significant risk to human health and the environment;
- Comprehensive Environmental Response, Compensation, and Liability Information System, which tracks contaminated properties identified under CERCLA and (SARA)
- Toxic chemical release inventory which identifies sites that have reported a chemical release to the air, water, or land as required by Title III of the Superfund Amendments and Reauthorization Act of 1986;
- Emergency Response Notification System, which identifies spills of oil or hazardous substances reported pursuant to Section 103 of CERCLA, as amended, Section 311 of the Clean Water Act, and Sections 300.51 and 300.65 of the National Oil and Hazardous Substances Contingency Plan;
- RCRA Information System, which includes facilities permitted to handle hazardous wastes under RCRA, including treatment, storage, and disposal facilities; large-quantity generators that report generation of greater than 1,000 kilograms/month of non-acutely hazardous waste or 1 kilogram/month of acutely hazardous waste; small-quantity generators that report generation of less than 1,000 kilograms/month of non-acutely hazardous waste or 1 kilogram/month of acutely hazardous waste; and facilities that have been cited by the US EPA for RCRA violations at least once since 1980; and

- RCRA Corrective Action Sites maintained by the US EPA website, includes RCRA-permitted facilities that are undergoing corrective action. A corrective action order is issued pursuant to RCRA Section 3008(h) when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates RCRA.

State Lists

The published lists of sites that trace remediation progress within the state include the following:

- Annual Work Plan, which is a site-specific expenditure plan for the appropriation of California Hazardous Substance Cleanup Bond Act of 1984 funds. This list is no longer updated.
- CalSites identifies potential hazardous waste sites, which are then screened by the State Department of Toxic Substances Control (DTSC). Sites on this list that are designated for no further action by the DTSC were not identified during the database review.
- CORTESE List, which is a compilation of information from various sources listing potential and confirmed hazardous waste and hazardous substance sites, maintained by the DTSC.
- Deed Restrictions Properties Report which tracks sites with deed restrictions.

The Regional Water Quality Control Board (RWQCB) is authorized by the SWRCB to enforce provisions of the Porter-Cologne Water Quality Control Act of 1969. This act gives the RWQCB authority to require groundwater investigations when the quality of groundwater or surface waters of the state are threatened and to require remediation of the site, if necessary. Both of these agencies are part of the California Environmental Protection Agency.

The following lists RWQCB databases of hazardous waste sites that were reviewed for the project:

- Leaking Underground Storage Tanks list (LUST or LUST Reg2) and LUST Information System, which track remediation status of known leaking underground tanks.
- Spill, Leak, Investigations, and Cleanups list (SLIC), North Bay County Toxics List, and Toxic Pits Clean Up Facilities (Toxic Pits), which include various hazardous waste sites within the jurisdiction of the San Francisco Bay RWQCB (Region 2).
- the Waste Management Unit Discharge System (WMUDS) list of sites which tracks waste management units. The list contains sites identified on the Toxic Pits List, which is required by the Toxic Pits Cleanup Act (Katz Bill), and places relatively strict limitations on the discharge of hazardous wastes into surface impoundments, toxic ponds, pits and lagoons (the RWQCB is required to inspect all surface impoundments annually). The WMUDS list also identifies sites targeted by the Solid Waste Assessment Program where there is a possible risk of discharging hazardous wastes, threatening either water or air quality.

Local Policies

City of Pleasanton General Plan

Goal 5: To minimize the risks to lives and property due to potential exposure to hazardous materials.

Policy 16: Regulate the transportation, delivery, use, and storage of hazardous materials within the city limits.

Program 16.1: Enforce the provisions of the City's Hazardous Materials Storage Permit Ordinance.

Program 16.2: Require scheduled on-site monitoring of all sewer outfalls for sites permitted to store hazardous materials.

Program 16.3: Expand the Fire Department's automated data system to speed identification of hazardous materials and users in the event of an emergency.

Policy 17: Ensure that hazardous materials and potential contamination are remediated prior to development.

Program 17.1: Require a site-specific soils report for new development where there is a history of prior industrial or agricultural land use activities.

City of Livermore General Plan

Goal PS-4 Protect the community from the harmful effects of hazardous materials.

Objective PS-4.1 Minimize Livermore residents' exposure to the harmful effects of hazardous materials and waste.

Policy P1. Residual repositories shall be prohibited within the City limits.

Policy P2. Areas with a land use designation of High Intensity Industrial are appropriate for hazardous waste management facilities if other siting criteria can be met and potential environmental impacts are mitigated as part of conditional approval.

Policy P3. The City shall promote the safe transport of hazardous materials through Livermore through implementation of the following measures:

- (a) Maintain formally designated hazardous material carrier routes to direct hazardous materials away from populated and other sensitive areas;

- (b) Prohibit the parking of vehicles transporting hazardous materials on City streets;
- (c) Require that new pipelines and other channels carrying hazardous materials avoid residential areas and other immobile populations to the greatest extent possible.

- Policy P4. Require the emergency response plans for all large generators of hazardous waste to be submitted as part of use applications.
- Policy P5. When reviewing applications for new development in areas historically used for commercial or industrial uses, the City shall require environmental investigation as necessary to ensure that soils, groundwater, and buildings affected by hazardous material releases from prior land uses, and lead and asbestos potentially present in building materials, would not have the potential to affect the environment or the health and safety of future property owners or users.
- Policy P6. Continue to encourage the reduction of solid and hazardous wastes generated within the City, in accordance with Countywide plans.
- Policy P7. The City shall encourage the reuse and/or recycling of debris following a disaster, in accordance with all applicable regulations.
- Action A1. Continue to implement processing procedures and local siting criteria in order to implement relevant and applicable provisions consistent with the hazardous material and waste management plans for Alameda County.
- Action A2. Ensure convenient access for Livermore citizens for the disposal of household hazardous wastes.

City of Dublin General Plan

4.6 Alameda County Hazardous Waste Management Plan

Policy 4.6.A. The City of Dublin shall encourage the reduction or elimination of hazardous wastes at the source site as the highest priority in the management of hazardous wastes.

Policy 4.6.B. The City of Dublin shall make provisions for the location of off-site hazardous waste facilities in its community which meet the fair share needs of the City of Dublin and of Alameda County.

Policy 4.6.C. The goals, policies, facility siting criteria and other provisions of the Alameda County Hazardous Waste Management Plan are incorporated herein by reference subject to the following provisions to the locational criteria of the plan:

1. Facilities for the land disposal of hazardous wastes or treatment residues are prohibited in the City of Dublin.
2. Small-Scale Transfer and Storage facilities shall include household hazardous waste collection facilities.
3. To assure that future and existing residential populations are adequately considered, the criteria for distances from facilities permitted by the plan shall be from the facilities to residential designated property.
4. To assure that facilities are appropriately located with regard to major transportation routes, all sites for offsite hazardous waste facilities shall be directly served by streets meeting the City's industrial road standards and shall be accessible via Major and Arterial streets as designated by the General Plan.
5. To provide an adequate level of public services and to assure an adequate margin of public safety, all facilities shall be adequately served by necessary public services as specified by the plan and shall be within a three (3) minute response time from the nearest fire station.
6. To assure proper land use compatibility and adequate proximity to the waste generation stream, all offsite hazardous waste facilities shall be located in areas designated Business Park/Industrial: Outdoor Storage, Business Park/Industrial: Low Coverage, and Industrial Park on the General Plan.

Policy 4.6.D. A violation of Zoning Ordinance Chapter 8.60, HAZARDOUS WASTE FACILITIES LOCATION PROCEDURE, pertaining to the Alameda County Hazardous Waste Management Plan is deemed to be a violation of the Dublin General Plan. The General Plan determines that the implementation of the Alameda County Hazardous Waste Management Plan through the guiding and implementing policies of the General Plan and by means of Chapter 8.60 of the Zoning Ordinance is necessary to protect the public health, safety, and welfare.

8.2.4 HAZARDOUS MATERIALS

Policy 8.2.4.A. Maintain and enhance ability to regulate use, transport, and storage of hazardous materials and to quickly identify substances and take appropriate action during emergencies.

Policy 8.2.4.B. Consider formation of a hazardous materials team consisting of specially trained personnel from all Tri-Valley public safety agencies.

Policy 8.2.4.C. Implement the Alameda County Hazardous Waste Management Plan, when it is approved by the State.

Policy 8.2.4.D. Adopt an ordinance to regulate handling, transport, and storage of hazardous materials and hazardous waste.

Alameda County General Plan – East County Area Plan

The East County Area Plan addresses hazards including wildland fires and airport hazards. The purpose of the East County Area Plan is “to present a clear statement of the County’s intent concerning future development and resource conservation within East County.” The Plan contains the following pertinent policies:

- Policy 134. The County shall not approve new development in areas with potential natural hazards (flooding, geologic, wildland fire, or other environmental hazards) unless the County can determine that feasible measures will be implemented to reduce the potential risk to acceptable levels, based on site-specific analysis.
- Policy 148. The County shall work with cities to ensure that all new uses approved within the Livermore Airport Land Use Commission referral area are consistent with the Airport Land Use Commission Policy Plan.
- Policy 150. The County shall recognize the Byron (East Contra Costa County) Airport as a regional resource, and shall work with Contra Costa County to ensure that land uses approved in Alameda County within the Byron Airport’s referral area are compatible with the airport’s operations.
- Policy 154. The County shall abide by the policies and Siting Criteria in the Alameda County Hazardous Waste Management Plan to ensure the responsible handling of hazardous waste in the County.
- Policy 319. The County shall adhere to the provisions of the Alameda County Fire Protection Master Plan and Fire Hazard Mitigation Plan.

**TABLE A.3.10-1
KNOWN CONTAMINATION IN THE VICINITY OF SMMP**

Reach	City		Location	LUFT	LUST	SLIC
1	LIVERMORE	2700	LAS POSITAS RD	X	X	
1	LIVERMORE	10840	ALTAMONT PASS RD	X	X	X
1	LIVERMORE	6175	FRONT ST S	X	X	
1	LIVERMORE	1000	VASCO RD N	X	X	
1	LIVERMORE	6952	PRESTON AVE	X	X	
1	LIVERMORE	909	BLUEBELL DR	X	X	
1	LIVERMORE	4700	1ST ST	X	X	
1	LIVERMORE	5237	FRONT ST S		X	
1	LIVERMORE	6211	LAS POSITAS RD		X	
1	LIVERMORE	1968	BLUEBELL DR	X	X	
1	LIVERMORE	115	VASCO RD S		X	
1	LIVERMORE	930	SPRINGTOWN BLVD	X	X	
2	LIVERMORE	2551	2ND ST	X	X	
2	LIVERMORE	444	N ST N	X		
2	LIVERMORE	1809	RAILROAD AVE	X	X	
2	LIVERMORE	4707	1ST ST	X	X	
2	LIVERMORE	17350	PATTERSON PASS RD	X	X	
2	LIVERMORE	3797	1ST ST	X		
2	LIVERMORE	2920	4TH ST	X		
2	LIVERMORE	5237	FRONT ST S	X		

Reach	City		Location	LUFT	LUST	SLIC
2	LIVERMORE	3927	1ST ST	X	X	
2	LIVERMORE	2500	RAILROAD AVE	X	X	
2	LIVERMORE	1682	1ST ST	X	X	
2	LIVERMORE	1119	GREENVILLE RD	X		
2	LIVERMORE	5830	LAS POSITAS RD	X	X	
2	LIVERMORE	7000	EAST AVE	X		
2	LIVERMORE	261	VASCO RD S	X	X	
2	LIVERMORE	115	VASCO RD S	X		
2	LIVERMORE	2730	OLD 1ST ST	X		
2	LIVERMORE	6211	LAS POSITAS RD	X		
2	LIVERMORE	5481	BRISA ST	X	X	
2	LIVERMORE	3357	GARDELLA PLAZA	X		
2	LIVERMORE	59	L ST S	X		
2	LIVERMORE	3360	1ST ST	X	X	
2	LIVERMORE	461	MC GRAW AVE	X		
2	LIVERMORE	2620	E OLD 1ST ST	X	X	
2	LIVERMORE	4530	LAS POSITAS ROAD	X	X	
2	LIVERMORE	3884	1ST STREET	X	X	
2	LIVERMORE	318	S. LIVERMORE AVE.	X	X	
2	LIVERMORE	7000	EAST AVE	X		
2	LIVERMORE	4904	FRONT RD S	X	X	
2	LIVERMORE	3737	1ST ST		X	

Reach	City		Location	LUFT	LUST	SLIC
2	LIVERMORE	1453	1ST ST	X	X	
2	LIVERMORE	1119	GREENVILLE RD		X	
2	LIVERMORE	7000	EAST AVE		X	
2	LIVERMORE	524	LIVERMORE AVE S		X	
2	LIVERMORE	461	MC GRAW AVE		X	
2	LIVERMORE	2900	LADD AVE	X		
2	LIVERMORE	785	STANLEY BLVD E	X	X	
2	Livermore	355	South Vasco Road			X
3	LIVERMORE	10057	TESLA RD	X	X	
3	LIVERMORE	1679	1ST ST	X	X	
3	LIVERMORE	900	LIVERMORE AVE S	X	X	
3	LIVERMORE	7000	DEL VALLE RD	X	X	
3	LIVERMORE	1111	STANLEY BLVD E	X	X	
3	LIVERMORE	17505	MINES RD	X		
3	LIVERMORE	2388	2ND ST	X		
3	LIVERMORE	4550	EAST AVE	X	X	
3	LIVERMORE	1800	FRIESMAN	X	X	
3	LIVERMORE	1485	1ST ST W	X		
3	LIVERMORE	1334	1ST ST	X		
3	LIVERMORE	1122	STANLEY BLVD E	X		
3	LIVERMORE	160	HOLMES ST	X	X	
3	LIVERMORE	2008	1ST ST	X	X	

Reach	City		Location	LUFT	LUST	SLIC
3	LIVERMORE	3357	GARDELLA PLAZA		X	
3	LIVERMORE	330	WOOD ST	X	X	
3	LIVERMORE	2730	OLD 1ST ST		X	
3	LIVERMORE	3797	1ST ST		X	
3	LIVERMORE	2322 38	1ST ST		X	
3	LIVERMORE	2920	4TH ST		X	
3	LIVERMORE	1429	COLLEGE AVE	X	X	
3	LIVERMORE	1334	1ST ST		X	
3	LIVERMORE	2388	2ND ST		X	
3	LIVERMORE	1485	1ST ST W		X	
3	LIVERMORE	1122	STANLEY BLVD E		X	
3	LIVERMORE	2900	LADD AVE		X	
3	LIVERMORE	1410	First Street			X
3	LIVERMORE	10	North Mines Road			X
3	LIVERMORE	250	North Mines Road			X
4	LIVERMORE	1175	CATALINA DR	X	X	
4	LIVERMORE	4951	ARROYO RD	X		
4	LIVERMORE	1771	1ST ST	X	X	
4	LIVERMORE	2253	5TH ST	X	X	
4	LIVERMORE	4951	ARROYO RD		X	
4	LIVERMORE	7000	DEL VALLE RD		X	
5	LIVERMORE	2150	KITTY HAWK RD	X	X	

Reach	City		Location	LUFT	LUST	SLIC
5	LIVERMORE	3033	COLLIER CANYON RD	X	X	
5	LIVERMORE	636	TERMINAL CR	X	X	
5	PLEASANTON	6750	SANTA RITA ROAD	X	X	
5	PLEASANTON	51	EL CHARRO RD	X		
6	LIVERMORE	1253	PORTOLA AVE	X	X	
6	LIVERMORE	524	LIVERMORE AVE S	X		
6	LIVERMORE	1733	MURDELL LN	X	X	
6	LIVERMORE	3800	1ST ST	X	X	
6	LIVERMORE	1830	PORTOLA AVE	X	X	
6	LIVERMORE	809	STANLEY BLVD. E	X	X	
6	LIVERMORE	1155	PORTOLA AVENUE	X	X	
6	LIVERMORE	899	RINCON AVE	X	X	
6	LIVERMORE	187	L ST N	X		
6	LIVERMORE	101	JACK LONDON BLVD	X	X	
6	LIVERMORE	1619	1ST ST	X	X	
6	PLEASANTON	1801	SANTA RITA RD	X		
6	PLEASANTON	1808	COURTNEY AVE	X		
6	PLEASANTON	52	EL CHARRO RD	X		
6	PLEASANTON	3110	BUSCH RD	X		
6	PLEASANTON	3000	BUSCH RD	X		
6	PLEASANTON	501	EL CHARRO RD	X		
6	PLEASANTON	51	EL CHARRO RD	X		

Reach	City		Location	LUFT	LUST	SLIC
6	LIVERMORE	909	CLUBHOUSE DR	X	X	
6	LIVERMORE	444	N ST N		X	
6	LIVERMORE	187	L ST N		X	
6	LIVERMORE		Juniper & Spruce			X
7	LIVERMORE	1901	ISABEL AVE	X	X	
7	LIVERMORE	601	VALLECITOS RD E	X	X	
7	PLEASANTON	1544	STANLEY BLVD	X		
7	PLEASANTON	780	MAIN ST	X		
7	PLEASANTON	3742	VALLEY AVE	X		
7	PLEASANTON	3786	VALLEY AVE	X		
7	PLEASANTON	65	RAY ST	X		
7	PLEASANTON	992	MAIN ST	X		
7	PLEASANTON	3400	BOULDER CT	X		
7	PLEASANTON	1024	MAIN ST	X	X	
7	PLEASANTON	4191	1ST ST	X		
7	PLEASANTON	4226	1ST ST	X	X	
7	PLEASANTON	151	WYOMING STREET	X	X	
7	PLEASANTON	349	MAIN ST		X	
8	DUBLIN	6401	DUBLIN BLVD	X	X	
8	DUBLIN	6393	SCARLETT CT	X	X	
8	DUBLIN	6450	DUBLIN BLVD	X	X	
8	PLEASANTON	4440	WILLOW RD	X		

Reach	City		Location	LUFT	LUST	SLIC
8	PLEASANTON	4568	WILLOW RD	X		
8	PLEASANTON	3192	SANTA RITA RD	X	X	
8	PLEASANTON	3956	OLD SANTA RITA RD.	X		
8	PLEASANTON	3790	HOPYARD RD	X	X	
8	PLEASANTON	5280	HOPYARD RD	X		
8	PLEASANTON	3830	OLD SANTA RITA RD	X		
8	PLEASANTON	349	MAIN ST	X		
8	PLEASANTON	5251	HOPYARD RD	X		
8	PLEASANTON	2991	HOPYARD RD	X		
8	PLEASANTON	5280	HOPYARD RD	X		
8	DUBLIN	6055	SCARLETT CT		X	
8	DUBLIN	6310	HOUSTON PL		X	
8	DUBLIN	6085	SCARLETT CT		X	
8	DUBLIN	5054	HAVENS PL		X	
8	DUBLIN	6015	SCARLETT CT		X	
8	DUBLIN	5965	DOUGHERTY RD		X	
8	PLEASANTON	3956	OLD SANTA RITA RD.		X	
8	PLEASANTON	51	EL CHARRO RD		X	
8	PLEASANTON	1228	QUARRY LN	X		
8	PLEASANTON	3830	OLD SANTA RITA RD		X	
8	PLEASANTON	5280	HOPYARD RD		X	
8	Pleasanton	5682	Stoneridge Drive			X

Reach	City		Location	LUFT	LUST	SLIC
8	Pleasanton	2771	Hopyard Road			X
8	Pleasanton	5353	Sunol Blvd.			X
9	DUBLIN	7249	VILLAGE PKWY	X	X	
9	DUBLIN	790	PARKSRFTA BLVD	X	X	
9	DUBLIN	11711	DUBLIN BLVD	X	X	
9	DUBLIN	8999	SAN RAMON RD	X	X	
9	DUBLIN	11989	DUBLIN BLVD	X	X	
9	DUBLIN	7420	DUBLIN BLVD	X	X	
9	DUBLIN	790	5th Street	X	X	
9	DUBLIN	7197	VILLAGE PKWY	X	X	
9	DUBLIN	7194	VILLAGE PKWY	X	X	
9	DUBLIN	7850	AMADOR VALLEY BLVD	X	X	
9	DUBLIN	7007	SAN RAMON RD	X	X	
9	PLEASANTON	7280	JOHNSON DR	X		
9	PLEASANTON	7132	JOHNSON DR	X		
9	PLEASANTON	7240	JOHNSON DR	X		
9	PLEASANTON	7043	COMMERCE CIR	X		
9	PLEASANTON	4141	FOOTHILL RD	X	X	X
9	PLEASANTON	7035	COMMERCE CIR	X	X	
9	PLEASANTON	5710	FOOTHILL RD	X		
9	DUBLIN	6400	DUBLIN BLVD		X	
9	DUBLIN	7840	AMADOR VALLEY BLVD		X	

Reach	City		Location	LUFT	LUST	SLIC
9	DUBLIN	7667	AMADOR VALLEY BLVD		X	
9	DUBLIN	6700	GOLDEN GATE DR		X	
9	DUBLIN	7099	AMADOR PLAZA RD		X	
9	DUBLIN	UNKNOWN	DUBLIN BLVD EXT		X	
9	DUBLIN	7400	AMADOR VALLEY BLVD		X	
9	DUBLIN	6841	VILLAGE PKWY		X	
9	DUBLIN	6973	VILLAGE PKWY		X	
9	DUBLIN	UNKNOWN	BRODER BLVD		X	
9	DUBLIN	UNKNOWN	4TH & MADIGAN		X	
9	DUBLIN	7575	DUBLIN BLVD		X	
9	DUBLIN	7499	DUBLIN BLVD		X	
9	DUBLIN	7375	AMADOR VALLEY BLVD		X	
9	DUBLIN	5787	SCARLETT CT		X	
9	DUBLIN	7494	DONAHUE DR		X	
9	DUBLIN	11976	DUBLIN BLVD		X	
9	DUBLIN	6207	SIERRA CT		X	
9	DUBLIN	7608	AMADOR VALLEY BLVD		X	
9	DUBLIN	6253	DOUGHERTY RD		X	
9	PLEASANTON	5251	HOPYARD RD		X	
9	PLEASANTON	2991	HOPYARD RD		X	
9	PLEASANTON	5710	FOOTHILL RD		X	
9	Dublin		Dougherty Road and Amador Valley			X

Reach	City		Location	LUFT	LUST	SLIC
9	Dublin		Dublin Blvd@Silvergate Dr.			X
9	Dublin	6341	Scarlett Court			X
9	Dublin		Dougherty Road and Amador Valley			X
10	PLEASANTON	4227	PLEASANTON AVE	X		
10	PLEASANTON	5335	SUNOL BLVD	X		
10	PLEASANTON	44	MISSION DR	X		
10	PLEASANTON	1155	SANTA RITA RD	X		
10	PLEASANTON	6177	SUNOL BLVD	X	X	
10	PLEASANTON	580	SANTA RITA RD E		X	
10	PLEASANTON	4191	1ST ST		X	
10	PLEASANTON	5675	SUNOL BLVD.	X	X	
11	PLEASANTON	707	COUNTRY CLUB CR	X		
11	PLEASANTON	4375	FOOTHILL RD	X		
11	PLEASANTON	5555	SUNOL BLVD	X	X	

APPENDIX 3.11

Public Services and Utilities

APPENDIX 3.11

PUBLIC SERVICES AND UTILITIES

A discussion of local, state and federal plans and policies that pertain to public services and utilities in the SMMP study area are presented below:

ALAMEDA COUNTY EAST COUNTY AREA PLAN

Policy 218. The County shall allow development and expansion of public facilities (e.g., parks and recreational facilities; schools; child care facilities; police, fire, and emergency medical facilities; solid waste, water, storm drainage, flood control, subregional facilities; utilities etc.) in appropriate locations inside and outside the Urban Growth Boundary consistent with the policies and Land Use Diagram of the East County Area Plan.

Policy 229. The County shall encourage Zone 7 to manage the water supply system so as to maintain water at Shadow Cliffs Regional Recreation Area at levels compatible with existing recreational facilities, if feasible.

Policy 252. The County shall encourage Zone 7 to pursue new water supply sources and storage facilities only to the extent necessary to serve the rates and levels of growth established by the Initiative and by the general plans of the cities within its service area.

Policy 255. The County shall encourage Zone 7 to maximize use of Chain of Lakes for water supply development and groundwater management. Zone 7 is encouraged to stage implementation of the system so that each component may be utilized as it becomes available.

Policy 256. The County shall discourage water service retailers from constructing new water distribution infrastructure which exceeds future water needs based on a level of development consistent with the Initiative.

Policy 277. The County shall work with the Alameda County Flood Control and Water Conservation District (Zone 7) to provide for development of adequate storm drainage and flood control systems to serve existing and future development.

Policy 278. The County shall promote flood control measures that advance the goals of recreation, resource conservation (including water quality and soil conservation), groundwater recharge, preservation of natural riparian vegetation and habitat, and the preservation of scenic values of the county's arroyos and creeks.

Policy 281. The County shall support and encourage the design of future flood control projects in a manner that preserves and/or restores and enhances riparian vegetation.

Policy 282. The County shall encourage use of natural or nonstructural storm water drainage systems to preserve and enhance the natural features of a site.

CITY OF PLEASANTON

Goal 1. To provide sufficient public facilities and services to ultimately serve the City in maximum financially available increments while preserving and enhancing the quality of life for existing and future residents.

Policy 4. Ensure an adequate water system for existing and future development, and maintain an adequate reserve of water in storage facilities.

Program 4.2. Develop a contingency plan for potential water shortages including groundwater management and water conservation.

Program 4.3. Work with Zone 7 to establish and monitor acceptable ranges of underground water levels and recharge when necessary.

Program 4.6. Utilize water reclamation methods to the fullest extent feasible.

Program 4.7. Work with Zone 7 to develop contingency plans for supplemental water sources independent of the State Water Project.

APPENDIX 3.12

Cultural Resources

APPENDIX 3.12

CULTURAL RESOURCES

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The East County Area Plan (amended November 2002), part of the Alameda County General Plan, includes the following policies that are relevant to the proposed project:

Policy 136. The County shall identify and preserve significant archaeological and historical resources, including structures and sites that contribute to the heritage of East County.

Policy 137. The County shall require development to be designed to avoid cultural resources or, if avoidance is determined by the County to be infeasible, to include and implement appropriate mitigation measures that offset the impacts.

Implementation Program 59. The County shall require a background and records check of a project area if the project is located within an extreme or high archaeological sensitivity zone as determined by the County. If there is evidence of an archaeological site within a proposed area, an archaeological survey by qualified professionals shall be required as part of the environmental assessment process. If any archaeological sites are found during construction, all work in the immediate vicinity shall be suspended pending site investigation by a qualified archeology professional. Proposed structures or roads on property that contains archaeological sites should be sited in consultation with a professional archaeologist to avoid damaging the sites. The County shall follow the California Environmental Quality Act (CEQA) Guidelines for cultural resource preservation procedures in reviewing development projects located near identified cultural resources. Appropriate measures for preserving an historic structure include renovation or moving it to another location. Proposals to remove historic structures shall be reviewed by qualified professionals.

CITY OF PLEASANTON

The City of Pleasanton General Plan (1996) identifies the following policies to protect cultural resources:

Policy 6. Preserve and rehabilitate those cultural and historic resources that are significant to Pleasanton because of their age, appearance, or history.

Program 6.2. Require archaeological studies in areas of known archaeological significance prior to development approval, and ensure that such studies meet the requirements of

CEQA Appendix K¹ in recommending mitigation measures if an archaeological site is encountered . Include provisions for the interpretation of cultural resources.

CITY OF LIVERMORE

The City of Livermore General Plan (2004) identifies the following policies to protect cultural resources:

Policy CC-3.1.P1. The City shall encourage, and when possible require, the preservation of places, sites, areas, buildings, structures, and works of humans which have cultural, archeological, or historical significance or other special distinction to the community.

Policy CC-3.1.P3. Whenever a historical resource is known to exist in or near a proposed project area, the City shall require an evaluation by qualified professionals as part of the environmental assessment process.

Objective CC-3.4. Identify and protect archeological and paleontological resources that enrich our understanding of early Livermore and the surrounding region.

Policy CC-3.4.P1. The City shall require proper archeological or paleontological testing, research, documentation, monitoring, and safe retrieval of archeological and cultural resources as part of a City established archeological monitoring and mitigation program.

Policy CC-3.4.P2. Whenever there is evidence of an archeological or paleontological site within a proposed project area, and archeological survey by qualified professionals shall be required as a part of the environmental assessment process.

Policy CC-3.4.P3. If an archeological site is discovered during construction, all work in the immediate vicinity shall be suspended pending site investigation by qualified professionals. If in the opinion of a qualified professional, the site will yield new information or important verification of previous findings, the site shall not be destroyed.

Policy CC-3.4.P4. Archeological sites should be preserved for research and educational programs. Where possible, such sites shall be made accessible to the public as part of the open space/recreation/educational system.

¹ Appendix K no longer exists; therefore, references to Appendix K are not appropriate. However, CEQA Guidelines Section 15064.5, and the California Public Resources Code , Division 13, Environmental Quality, Sections 21038.2 and 21084.1 afford protection of cultural resources.

APPENDIX 3.13

Visual Resources

APPENDIX 3.13

VISUAL RESOURCES

CONSISTENCY WITH COUNTY AND LOCAL REGULATIONS, GOALS, AND POLICIES

Alameda County, and the cities of Pleasanton and Livermore identify goals and policies in their General Plans that protect visual resources within individual jurisdictions. The relevant policies related to visual resources are presented below. The proposed project would be consistent with these goals and policies of the affected jurisdictions.

ALAMEDA COUNTY EAST COUNTY AREA PLAN

Sensitive Viewsheds

Goal: To preserve unique visual resources and protect sensitive viewsheds.

Policies

Alteration of Landforms

Policy 116: To the maximum extent possible, development shall be located and designed to conform with rather than change natural landforms. The alteration of natural topography, vegetation, and other characteristics by grading, excavating, filling or other development activity shall be minimized. To the extent feasible, access roads shall be consolidated and located where they are least visible from public view points.

Grading

Policy 117: The County shall require that where grading is necessary, the off-site visibility of cut and fill slopes and drainage improvements is minimized. Graded slopes shall be designed to simulate natural contours and support vegetation to blend with surrounding undisturbed slopes.

Policy 118: The County shall require that grading avoid areas containing large stands of mature, healthy vegetation, scenic natural formations, or natural watercourses.

CITY OF LIVERMORE GENERAL PLAN

Policies relating to visual resources in the Livermore General Plan are listed below.

GOAL CC-1 Preserve and enhance Livermore's natural setting

Objective CC-1.1 Use open space to protect and enhance local community character and identity, to preserve rural characteristics, and to provide an edge to urban growth.

P11. The City shall preserve and enhance, or work with and support the efforts of other agencies, as appropriate (e.g. with joint grant applications, sharing of staff resources and legal services), to preserve and enhance the following natural amenities:

- (a) Ridgelines
- (b) Oak woodlands and grasslands
- (c) Grasslands
- (d) Riparian Woodland
- (e) Arroyos and Creeks
- (f) Knolls
- (g) Brushy Creek
- (h) Arroyo Mocho/Cedar Mountain
- (i) Corral Hollow
- (j) Sycamore Grove
- (k) Hilltops (NLUGBI)
- (l) Slopes (NLUGBI)
- (m) Viewscapes (NLUGBI)
- (n) Frick Lake
- (o) Springtown Alkali Sink

P12. The City shall preserve and enhance the following manmade amenities:

- (a) Vineyards
- (b) Other agriculture
- (c) Lake Del Valle
- (d) Scenic Highways, Roads and Corridors
- (e) Buildings of Historic or Architectural Significance or Interest
- (f) Community Entrance Points

GOAL CC-4 Protect and enhance public views within and from established scenic routes, including views of arroyos.

Objective CC-4.1 Protect public views from scenic routes and corridors

P1. Development shall not be allowed to obscure, detract from or negatively affect the quality of the views from designated scenic routes.

P3. The City shall permit no development to wholly obstruct or significantly detract from views of any scenic area as viewed from a scenic route.

Objective CC-4.15 Control the alteration of streambeds and bodies of water in scenic routes.

P1. Alteration of streambeds or bodies of water and adjacent vegetation should be permitted only with approval of the local jurisdiction, as a means of preserving the natural scenic quality of stream courses, bodies of water, vegetation and wildlife in the Valley.

P2. Development adjacent to streams, canals, reservoirs, and other bodies of water should be in a manner that will preserve the natural scenic qualities of the area, or when scenic qualities are minimal shall be designed and treated so as to result in naturalistic forms. Zone 7 has adopted Interim Design Standards and Practices for future construction improvements of channels. Any developments with arroyos and creeks fall under these standards and are subject to Zone 7's review to ensure there are no impacts to Zone 7 facilities.

CITY OF DUBLIN GENERAL PLAN

5.6 SCENIC HIGHWAYS

Guiding Policy

Incorporate County-designated scenic routes, and the proposed Fallon Road extension, in the General Plan as adopted City-designated scenic routes, and work to enhance a positive image of Dublin as seen by through travelers.

Implementing Policy

Exercise design review of all projects visible from a designated scenic route