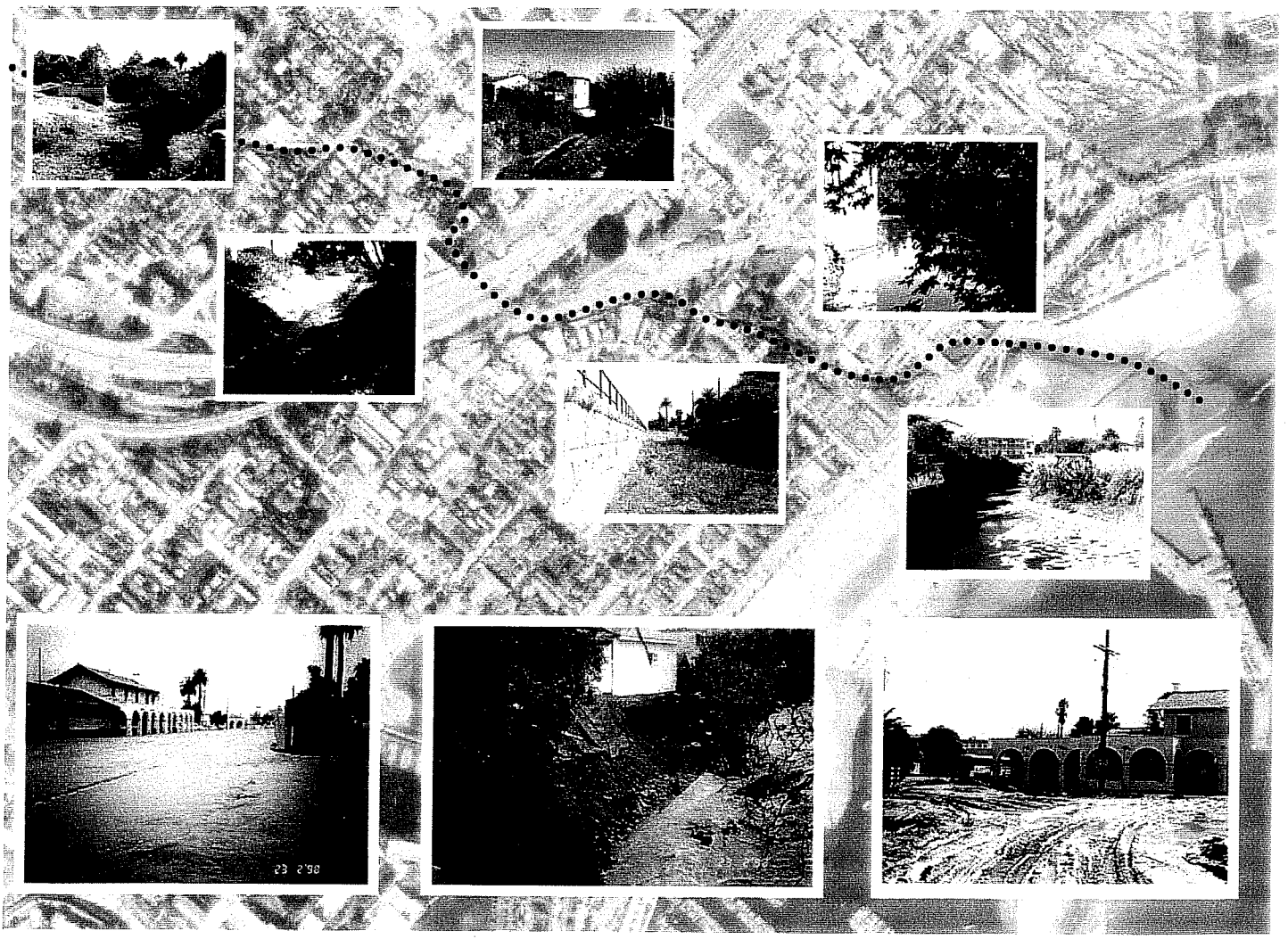
US Army
Corps of Engineers
Los Angeles District
South Pacific Division

**FINAL EIS/EIR , September 2000**

## SANTA BARBARA COUNTY STREAMS

# LOWER MISSION CREEK FLOOD CONTROL FEASIBILITY STUDY



Los Angeles District, Corps of Engineers
Planning Division
P.O. Box 532711
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**Final**
**Environmental Impact Statement/Environmental Impact Report (EIS/EIR)**
**Proposed Plan for Flood Control**
**Lower Mission Creek Flood Control Project**
**Santa Barbara**
**Santa Barbara County, California**

The lead Federal agency is the U.S. Army Corps of Engineers, Los Angeles District.
The responsible agencies for compliance with the California Environmental Quality Act are the Santa Barbara County Flood Control and Water Conservation District, and the City of Santa Barbara Public Works Department.

**Abstract**: The Feasibility Report for the Lower Mission Creek Flood Control Project resulted in the selection of a final array of alternatives to protect the city of Santa Barbara against future flooding. This EIS/EIR specifically addresses alternatives 12, 6, 8 and 1-No Action Alternative. These alternatives would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of protection. Channel improvements would occur for approximately the last mile of the creek between the Canon Perdido Street Bridge at the upstream end, and the Cabrillo Boulevard Bridge near the outlet. Alternative 12, the National Economic Development (NED) and tentatively recommended plan, includes: natural creek bottom; replacement of four bridges, streamlining bedslope, installing a culvert that bypasses the oxbow, stabilizing creek banks using a combination of vertical walls and vegetated riprap; and construction of habitat zones and a wetland. Alternative 6 consists of: natural creek bottom; stabilized creek banks with vertical walls and vegetated stepped banks; replacement of seven bridges; streamlining bedslope; construction of habitat zones, a wetland; and the oxbow would be widened to convey higher flows. Alternative 8 consists of: natural creek bottom; stabilization of creek banks with vertical concrete walls; replacement of five bridges; streamlining bedslope, installing a culvert that bypasses the oxbow; and construction of habitat expansion zones and a wetland. Future maintenance is a integral part of the project design for all alternatives identified about, and it is included in the project description for the life of the project. Project design incorporates planting of vegetation along upper banks, within vacant land parcels, and construction of a wetland. Alternative 12 would provide maximum incidental environmental benefits, and it is an environmentally superior plan compared to other viable alternatives considered during the feasibility study. A Modified Habitat Evaluation Procedure (HEP) has been developed to identify the existing value of biological resources and evaluate impacts related to the project implementation and future maintenance. Alternative 8 would be environmentally damaging compared to alternatives 6 and 12. Mitigation measures and environmental commitments summarized in section 24 and Mitigation Monitoring Plan (Appendix H) of this EIS/EIR would be implemented to minimize impacts to biological, cultural, traffic, water quality, air quality and noise. Mitigation measures would be similar for all evaluated alternatives in the EIS/EIR.

Under the No Action Alternative, the existing channel would remain in place and periodic maintenance would be required, however the City of Santa Barbara would be subject to flooding.

THE OFFICIAL CLOSING DATE FOR THE RECEIPT OF COMMENTS IS 30 DAYS FROM THE DATE ON WHICH THE NOTICE OF AVAILABILITY OF THIS FINAL EIS APPEARS IN THE FEDERAL REGISTER.

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NOTE: Information, displays, and maps discussed in the Main Feasibility Study Report for a flood control project on Lower Mission Creek are incorporated by reference in this EIS/EIR.

# FINAL ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONMENTAL IMPACT REPORT (EIS/EIR) LOWER MISSION CREEK FLOOD CONTROL PROJECT

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# (EIS/EIR)

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**STUDY AUTHORITY:** The Lower Mission Creek Flood Control Project is authorized under Section 209 of the Flood Control Act of 1962 (Public Law 87-874, 87th Congress, 2nd session), which reads in parts as follows:

*"Sec. 209. The secretary of the Army is hereby authorized and directed to cause surveys for flood control and allied purposes, ... to be made under the direction of the Chief of Engineers, in drainage areas of the United States and its territorial possessions, which include the following named localities* [including]: *All Streams in Santa Barbara County, California, draining the Santa Ynez Mountains, except Santa Ynez River and tributaries."*

## PROJECT LOCATION:

The Mission Creek drainage area is located in and adjoining the City of Santa Barbara, California, about 100 miles northwest of the City of Los Angeles. The drainage area, comprising about 11.5-square miles, is a narrow coastal area and extends from the Santa Ynez Mountains on the north to the Pacific Ocean on the south. Mission Creek begins at about 4,000 feet elevation and flows about 8 miles through the City of Santa Barbara to empty into the Pacific Ocean (see Figure 1.1-1 of the EIS/EIR). The scope of this study is to evaluate potential benefits, impacts and necessary mitigation requirements associated with flood control measures within the Lower Mission Creek Area. The study is limited to the final 1.2 miles of the creek, from just downstream of Canon Perdido Street to Cabrillo Boulevard.

## INTRODUCTION:

This document is written in compliance with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). The lead Federal agency is the U.S. Army Corps of Engineers, Los Angeles District. The responsible agencies for compliance with the California Environmental Quality Act are the Santa Barbara County Flood Control and Water Conservation District and the City of Santa Barbara.

In the development of alternatives, extensive coordination occurred between the U.S. Army Corps of Engineers (USACOE), Santa Barbara County, the City of Santa Barbara and concerned business/property owners and environmental groups. Several public workshops and a formal public scoping meeting were conducted to obtain public views regarding the project and development of alternatives. Previously prepared engineering and environmental reports have been reviewed to identify problems and development of the alternatives. The alternatives were evaluated based on past flooding history and the need to provide flood protection to the City of

Santa Barbara. In the development of alternatives, protecting properties or reducing the flood threat to the residences and businesses located in the vicinity of Lower Mission Creek and preservation of the environment were considered.

Twelve structural Alternatives were evaluated during the Feasibility Study. These alternatives included a No Action Plan, plans with 2500 cubic feet per second (cfs) capacity with two different channel configurations, and plans with 3400 cfs capacity with nine different channel configurations. Differences in channel configuration are due to the use of the oxbow-bypass and different combinations of bank protection. Alternatives 2 and 3 would be designed to convey a flow of 2500 cfs, providing about a 15- year level of protection, and alternatives 4 through 12 would be designed to convey a flow of 3400 cfs, which would provide about a 20-year level of protection.

R In the Draft and Final EIS/EIR, eight of the twelve Alternatives were not evaluated further for environmental analysis. Based on the economic analysis performed during the feasibility study phase, four of them, Alternatives 2, 3, 5, and 9, did not meet the benefit to costs (b/c) ratio; these alternatives were not evaluated in the Draft EIS/EIR.

R During preparation of the Final EIS/EIR and revised biological assessment, extensive coordination occurred with the concerned resource agencies. (See Section 1.7.2 of the Final EIS/EIR for details on coordination). The project design and mitigation have been modified due to the resource agencies/public concerns and real estate constraints. Additional mitigation features have been added in the project design to minimize impacts to Federally listed endangered and threatened species. The economic analysis was updated to incorporate costs of the modified project design, mitigation features and real estate. Based on revised economic analysis, Alternatives 2, 3, 5, 6, 7 and 9 do not meet economic requirements.

R At request of the California Coastal Commission (CCC) and in response to public comments, the USACOE performed an informal economic analysis of two smaller versions of the Recommended Plan; both would have a conveyance capacity of 2500 cfs providing approximately 15-year level of protection. The first alternative would use the combination toe wall and riprap slope (similar to the Recommended Plan) to protect and stabilize the creek banks, and the second alternative would use riprap slope protection to stabilize the entire height of the banks. Both alternatives would apply the proposed bank protection upstream and downstream of Highway 101. Results of this informal analysis can be found in the Economic Appendix of the Main Report. Available information from the earlier 2500 cfs Alternatives found in the feasibility report, including construction costs, right-of-way costs and damage reduction benefits, were used in this analysis. The results indicate that these two alternatives would not be economically feasible.

**NEED FOR THE PROJECT:**

The main purpose of this project is to provide flood protection to the City of Santa Barbara. Mission Creek, especially downstream from Carrillo Street, poses a serious flood threat to the City. In this area, a mix of residential, commercial, and public properties are subject to major damages during floods. Details on flooding history are provided in the Main Report, Section II.

## PLANNING OBJECTIVES:

The objective of this study is to analyze the flooding and associated problems along Lower Mission Creek, to consider alternative solutions to the flood and associated problems, and to recommend, for implementation, a solution to these problems. In development of alternatives, consideration has been given to the economic, environmental, and social needs of the study area. The Federal objective of water and related land resources planning is to contribute to national economic development consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders and other Federal planning requirements. Details are provided in Section 2 of the EIS/EIR.

## BACKGROUND OF DEVELOPMENT OF THE ALTERNATIVES:

Section 3 of the EIS/EIR and Section IV of the Main Report provide history of the project and plan formulation information. Twelve structural Alternatives were evaluated during the Feasibility Study. These alternatives included a No Action Plan, plans with 2500 cfs capacity with two different channel configurations, and plans with 3400 cfs capacity with nine different channel configurations. Differences in channel configuration are due to the use of the oxbow-bypass and different combinations of bank protection.

After the Alternatives Formulation Briefing, based on environmental benefits and the cost benefit ratio, a decision was made that Alternative 12 provides the most incidental environmental benefits and meets the required cost benefit ratio. The proposed alternatives were similar in nature; therefore, based on criteria, similarities and differences in the basic design features, the decision was made to evaluate four Alternatives for detailed environmental analysis in the Draft EIS/EIR. They are Alternatives 1, 6, 8, and 12. Alternative 1 continues to be the No Action plan against which the consequences of structural solutions are evaluated. The Final EIS/EIR evaluates impacts related to the same alternatives analyzed in the Draft EIS/EIR. Design features associated with these alternatives are identified in the following Table ES-1.

**TABLE ES-1**
**COMPARISON OF DESIGN FEATURES OF ALTERNATIVES EVALUATED FOR ENVIRONMENTAL ANALYSIS**

Only these Alternatives will be evaluated further. Alternative 12 has been identified as the NED (National Economic Development) and tentative preferred plan.

| Design Feature | Alt. 6 | Alt. 8 | Alt. 12 (NED) |
|---|---|---|---|
| Conveyance capacity | 3,400 $ft^3$/sec | 3,400 $ft^3$/sec | 3,400 $ft^3$/sec |
| Oxbow bypass | no | Yes | yes |
| Some vertical walls | yes | Yes | yes |
| Some stepped walls | yes | No | no |
| Some riprap slopes with native vegetation above short vertical walls | no | No | yes |

R The remaining eight Alternatives were not evaluated further for environmental analysis. Since the release of the Draft EIS/EIR, the economic analysis was updated to incorporate costs of the modified project design, mitigation features and real estate. Based on revised economic analysis, Alternatives 2, 3, 5, 6, 7 and 9 do not meet economic requirements. The various design features of Alternatives 4, 6, and 7 have corresponding equivalents in Alternatives 8, 10, and 11. However, Alternative 12 also corresponds to design features of Alternatives 10 and 11. Based on those equivalencies, further environmental evaluation has not been performed for Alternatives 4, 7, 10, and 11. Plans of all alternatives except Alternative 1 are provided in the Main Report. ***The numbering of Alternatives is kept the same as the Main Report for consistency and comparison purposes. The Main Report describes all 12 Alternatives formulated during the feasibility study. Alternative 12 is the tentatively preferred alternative; therefore, it has been described first, followed by Alternatives 6 and 8.*** The project description for Alternative 12, NED/tentatively preferred plan, and brief descriptions of Alternatives 6, 8 and 1 (No Action) are provided below.

## ALTERNATIVE 12 - NATIONAL ECONOMIC DEVELOPMENT (NED)/ TENTATIVELY PREFERRED PLAN - THE PROJECT DESCRIPTION:

Alternative 12 is the NED and tentatively recommended plan, which provides maximum incidental environmental benefit. This alternative is environmentally superior compared to other feasible alternatives. The project description includes features associated with the tentatively proposed alternative. Section 3.5 of the EIS/EIR provides a detailed project description.

R Alternative 12 consists of: improvements to the soft bottom channel for approximately the last mile of the creek between the Canon Perdido Street Bridge at the upstream end, and the Cabrillo Boulevard Bridge near the outlet; replacement of four bridges, streamlining bedslope, installing a culvert that bypasses the oxbow, stabilizing creek banks using vertical walls and riprap sideslope; and planting of native vegetation along the riprap; and construction of five small habitat expansion zones (See details in Section 3.5 of the EIS/EIR). This alternative would also provide the opportunity to construct another habitat expansion zone in the vicinity of the oxbow formation area. This habitat expansion zone would be located just upstream of Highway 101. This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of flood protection. The creek width would range from 60 to 70 feet at the top within the project reach. The specific width of the channel at each bridge crossing is listed in Chapter 4, Plan Formulation, of the Main Report. The average depth of the constructed creek would be 8 to 12 feet throughout the project reach. Future maintenance for the life of the project is included in this project description. Future maintenance of the constructed channel is essential to retain the form and design capacity of the creek. Impacts related to future maintenance are addressed in the EIS/EIR. Chapters 6 through 19 describe existing conditions and address impacts related to this proposed project. Environmental commitments and mitigation measures are included to avoid/reduce or minimize impacts to natural and cultural resources. A brief description of each feature is provided in the following paragraphs.

R **Removal of Existing Bank Protection and Earthen Material:**

The creek bottom and banks for about a mile, between the Canon Perdido Street and

Cabrillo Boulevard Bridges, would be excavated to increase the creek capacity to provide a 20-year level of flood protection to the City of Santa Barbara. The total amount of material to be excavated from creek banks and creek bottom would be about 82,000 cubic yards (CY). The material could be distributed to other construction sites requiring fill. All of the sandstone not used in project construction will either be conserved for use in other City projects or recycled. Most of the metal and concrete can be recycled. The green waste can be composed and recycled as compost and mulch. The USACOE will examine the suitability of the excavated materials for beach nourishment. If material is suitable, it can be used to restore sand supply on local beaches. Excavated material would be partially stockpiled in the staging areas located along the creek bank and the remaining material would be transported to disposal sites located within a radius of about 10 to 25 miles from the project site. About 17,000 to 18,000 Cubic Yards (CY) of material would be utilized in project construction as fill material. The remaining material would be disposed off at available disposal sites.

**Stabilization of Creek Banks**:

The existing creek banks would either be replaced with the combination short walls and riprap sideslopes or vertical walls. Lower banks would be stabilized by short vertical walls; appropriate aesthetic treatment would be applied to minimize aesthetic impacts for visible portions of the creek banks. The upper banks would be stabilized by vegetated riprap. Concrete pipes of varying sizes, would be placed vertically in between the riprap, in these pipes native or riparian type vegetation would be planted.

**Oxbow Culvert**:

R **Weir Inlet and Culvert that Bypasses the Oxbow:**

The oxbow is located between the Gutierrez Street and Chapala Street Bridges, where the creek makes several meandering turns. The culvert alignment would be outside the Moreton Bay Fig tree dripline to minimize impacts to its major root system. Two culverts (15-foot wide by 6-foot high boxes) connecting both ends of the oxbow are referred to as the overflow culvert or the "oxbow bypass." The overflow culvert would follow a more direct path across the oxbow. It would begin upstream of Highway 101, pass under the highway (where Caltrans had built a span to accommodate such a crossing to eliminate impacts to highway traffic), Montecito Street, and the railroad tracks before rejoining the creek alongside the downstream end of Chapala Street Bridge (See Figure 3.5.2.1-3 of the EIS/EIR).

**Removal and Replacement of Bridges**:

Twelve bridges span Lower Mission Creek before emptying in to the Pacific Ocean. Four of those bridges would need to be replaced including Ortega Street, Cota Street, De la Vina Street, and Mason Street Bridges. De La Vina Street Bridge will be replaced by the City prior to implementation of this project. Construction of the bridge replacements at the road crossings would need to be phased so that the adjacent road crossing could be used as a detour. Bridge reconstruction would start with the most downstream bridge (Mason State Bridge) and progress sequentially in the upstream direction ahead of the creek improvements. Detailed project descriptions of each bridge are provided in Section 3.5 of the EIS/EIR.

**Habitat Expansion Zones**:

Approximately five small parcels of open land would be planted with native and riparian type of vegetation. These parcels range in size between 0.03 and 0.52 acres (see figure 3.5.4 of EIS/EIR for locations). Habitat expansion zones would be designed to serve a dual purpose: to expand the corridor of riparian habitat to be planted along the stream banks and to provide passive recreational area for residents.

R The proposed project provides an opportunity for construction of an additional habitat zone in the vicinity of the oxbow formation area. This area was originally proposed as a constructed wetland. However, after further review, it was determined that this site is more suitable for use as a habitat expansion zone, as described above. However, construction of this habitat zone is subject to cleanup of the existing known contamination on the site (see details in Section 15, HTRW, of the EIS/EIR).

R **Pilot Channel:**

The project's design for the creek's invert includes scoring a "pilot channel" into the bottom as the last element of construction. Otherwise, the streambed would be a uniformly flat expanse of native sediments between the toe walls. This pilot channel would constitute a permanent component of the instream habitat between Canon Perdido and Highway 101, although one possibly given to positional shifts as the finished creek bed evolves. No pilot channel would be fashioned into the creek bed below Yanonali Street. Between Yanonali and Mason Streets, periodic tidal ebb and flow would largely negate the intended purpose of such a channel, and below Mason Street the tidal movements would very quickly would make it thoroughly ineffective.

A pilot channel large enough to carry at least 50 $ft^3$/sec would be adequate to carry water along the preferential innate course. Its physical size and shape would also be determined after final hydraulic analyses, but would probably be generally trapezoidal in appearance and 10 to 12 feet wide and about 1 foot deep. The channel would be enriched with representative types and gradations of the larger native substrates - coarse gravels, small cobbles, and rocks or boulders as currently exist within Mission Creek.

R **Structural Features to Mitigate and Avoid Impacts to Biological Resources:**

Several structural features would be included to avoid and mitigate impacts to biological resources. These permanent and durable mitigation features would create hiding places where fish may take refuge. They would be composed of four separate structural elements formed by coarse surface relief of the walls (goby refugia), artificial overhangs projecting from the walls (fish ledges), placing double rows of coarse boulders (fish baffles) between the overhangs along the creek walls (See Figure 3.5.2.1-18) and rock energy dissipaters. In combination, they should provide shelter for fish of all sizes. See Section 3.5 of the EIS/EIR for the detailed description of these features. Section 10 and the Biological Assessments provide purpose, implementation and mitigation provided by these features.

**Duration of Construction**:

Project construction, including the proposed creek improvements, oxbow culvert, and bridge replacements, is expected to take a minimum of two years to complete. During construction, excavation activities would not be carried out during heavy rain and flooding season. Every effort would be made to complete the project construction within two years. However, due to weather conditions/seasonal heavy rainfall, mechanical failure, or funding constraints, completion of the project construction could be delayed. In that case, project construction could take up to three or four years to complete. Project construction is scheduled to begin in mid-2003.

**Staging / Stockpiling Areas:**

The proposed staging area would be located north of Highway 101 adjacent to the channel with access off of De la Vina Street. This area could also be used for construction access. Another possible staging area would be located north of the channel between the railroad and Yanonali Street. Additional access points could be at State Street, Mason Street, Montecito Street, Cota Street, Bath Street, Ortega Street, and north of De La Guerra Street. At this staging area, the selected contractor would install a temporary trailer with the sanitary facilities. Small quantities of material excavated (about 3000 to 4000 cy) from the creekbed would be stockpiled at these local staging areas, but the majority of it would be recycled or transported to the remote stockpile/disposal site, about 20 miles from the project area.

**Haul Routes:**

Hauling of materials and equipment to and from the project site would primarily use Highway 101 and the three nearby on/off ramps. Carrillo Street on/off ramp is located near the upstream end of the project, while Castillo Street on/off ramp is near the lower end and provides the most direct route to the proposed staging and stockpiling sites. Access and haul routes from the staging and stockpiling sites to the specific creek construction site would use streets that are nearest to the creek, taking the most direct route. Above Highway 101, it is expected that De la Vina, Castillo, and Bath Streets would generally be the main haul routes to and from the staging area, while Castillo, Montecito, Yanonali, Mason, and State Streets would provide the main access during construction downstream of Highway 101.

R **Future Operation and Maintenance:**

Future maintenance of the creek is an integral part of the Recommended Alternative (Alternative 12). To ensure and maintain its design function and form, some activity to maintain the design capacity of the channel would be needed on a regular basis. Any areas where sediment deposition and/or vegetation growth occur beyond 15% of the channel capacity would be required to be removed to maintain the capacity of the project reach. Future maintenance would also include maintenance of the structures such as cleaning of oxbow culverts and the pilot channel, repair of vertical concrete walls and riprap (bottom riprap lining and baffle piers), structures for mitigation, and maintenance of planted vegetation (after initial establishment required as part of project construction). It is estimated that the frequency of sediment removal would be at an interval as often as once a year. However, when several low-flow years occur

sequentially, sediment removal might occur every two to three or more years. Floodflows and debris accumulation and removal would continue to impact channel vegetation and aquatic resources. Over time, pools and riffles that provide aquatic habitat would reestablish in the channel (See denials in Section 3.5 of the EIS/EIR).

Impact analysis for future maintenance is included in each resource is discussed in this EIS/EIR. Impacts related to maintenance activities are addressed in Chapters 6 through 19. Mitigation measures for future operation and maintenance for the life of the project are included in this EIS/EIR. Conditions identified in the EIS/EIR, Biological Opinions, and Mitigation Monitoring Plan would be followed during each operation and maintenance activity.

Alternative No - 1: **No Action:** With this alternative (future without project conditions), the existing channel and sideslope protection would remain in place. No flood protection would be provided to the residents and commercial properties located in the vicinity of the Lower Mission Creek. The No Action Alternative provides about 1,500 cfs capacity.

Alternative No. 6: **3400 cfs Flood Level Capacity Without Oxbow Bypass - Stabilized sides using predominantly vegetated stepped walls with vertical walls applied for the remaining reaches**. This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of protection. The natural bottom would be maintained and would consist of vegetated stepped banks at a 2:1 (V: H) slope upstream of Highway 101. Downstream of Highway 101, vegetated stepped walls would be applied along the southeast bank, starting from midway between the Chapala and Mason Street Bridges to the State Street Bridge, and along the middle third of the southwest bank between Mason and State Streets. Vertical walls would be maintained for the remainder of this reach. The improved creek would generally follow the existing alignment throughout the project reach. The creek would be 50 to 70 feet wide at the top of the bank and 8 to 12 feet deep. Seven bridges along the study reach would be replaced: the Ortega Street, Cota Street, De la Vina Street, Montecito Street, Union Pacific Railroad, Chapala Street, and Mason Street Bridges. The habitat expansion zones are also a project design for this alternative. Future maintenance would remain the same as identified under Alternative 12. This alternative would have all features identified under Alternative 12, except installation of culvert and stabilization of creek banks with vegetated stepped walls (see table ES-1). The remaining project description would be the same as identified under Alternative 12. It would not be as environmentally damaging as Alternative 8.

**Without Oxbow Bypass:**

Lower Mission Creek develops meandering course near Downtown Santa Barbara, between Yanonali and Gutierrez Streets. At this location, a oxbow has been developed. This alternative would involve stabilization of the creek banks and modification of the creek course along the oxbow, including the manmade sandstone channel. Construction along and/or within the oxbow area is called the "Without Oxbow Bypass." The location of the oxbow is shown on Figure 3.5-2 of the EIS/EIR.

**Stepped Walls:**

Under Alternative 6, the creek banks would be stabilized by construction of stepped walls instead of riprap. The step would allow planting of appropriate species in spaces filled with soil. These steps would be uniformly five feet wide, which would allow planting of vegetation along the creek banks. Planted shrubby native species along stepped walls would grow to an understory plant community in future.

**Alternative No. 8: 3400 cfs Flood Level Capacity with Oxbow Bypass - Stabilized sides using vertical walls.** This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of protection. The natural bottom would be maintained while bank treatment would consist of concrete vertical walls throughout the project reach. This alternative would incorporate a new culvert, by-passing the oxbow between just upstream of Highway 101 and the Chapala Street Bridge. The improved creek would generally follow the existing alignment except at the oxbow which would be left in place to function as a low flow channel. The creek would be 44 to 60 feet wide at the top of the bank, except between the State Street and Cabrillo Boulevard Bridges where it would be 60 to 70 feet wide. The average depth of the creek would be between 8 and 12 feet. Culverts would be installed in an open space near the Moreton Bay Fig Tree, between Gutierrez and Yanonali Streets. Installation of culverts outside of the creek bed is called "With Oxbow Bypass" (see figure 3.5.2 of the EIS/EIR). Five bridges along the study reach would be replaced: the Ortega Street, Cota Street, De la Vina Street, Chapala Street, and Mason Street Bridges. The project features for this alternative are similar to Alternative 12, except the sideslopes would be stabilized by vertical concrete walls instead of a combination of short-vertical walls and vegetated riprap. Habitat expansion zones are part of this alternative design. This alternative would result in significant impacts on aesthetics and recreational resources. This alternative would not provide environmental benefits which would be provided by Alternatives 12 and 6. Please refer to the text of Alternative 12 for a detailed project description.

## PUBLIC PARTICIPATION:

Public participation is important in the environmental analysis for providing assistance in defining the scope of analysis in the EIS/EIR; identifying significant environmental issues and project related impacts. Participation of affected Federal, State, and local resource agencies, Native American groups and concerned interest groups/individuals is encouraged in the scoping process. Public participation is initiated by providing the Notice of Intent and Notice of Preparation of the EIS/EIR. Prior to initiation of the EIS/EIR, a public workshop was conducted on August 28, 1997 at the City of Santa Barbara. The purpose of the workshop was to provide an update on the progress of the Lower Mission Creek Feasibility Study to the Santa Barbara area public and provide an opportunity to the residents to discuss their concerns about flooding, the environment, potential solutions, and issues related to the project.

On October 29, 1998, the Los Angeles District, U.S. Army Corps of Engineers, and the City of Santa Barbara Planning Commission hosted a public scoping meeting at the Santa Barbara, City Council Chambers to obtain agency and community views and concerns. The concerns expressed at the meeting included the need to consider a variety of alternatives; the need to address biological resources including such sensitive species as steelhead and the

California red legged frog; the need to consider potential impacts to air quality, water quality, aesthetics, safety, and cultural resources; and the need to comply with both the National Environmental Policy Act and the California Environmental Quality Act. All of these concerns have been addressed during project planning and preparation of the EIS/EIR. Comment letters received from the public during scoping process are located in Appendix I of the EIS/EIR. Concerns identified by the public on August 28, 1997, were similar to the concerns raised at the public scoping meeting for the EIS/EIR. See details in Section 2 of the EIS/EIR.

R **Public Review of Draft EIS/EIR**:

The Draft EIS/EIR was provided for public review in December 1999. The Corps of Engineers filed copies of the EIS/EIR with the EPA on December 15, 1999. The Notice of Availability (NOA) of the Draft EIS/EIR was published in the Federal Register on December 23, 1999. Copies of the Draft EIS/EIR were provided to California State Clearing House (SCH# 1998101061) for agency distribution in compliance with CEQA. The City of Santa Barbara published the NOA of the Draft EIS/EIR and public hearing in the local Newspaper and distributed the NOA to property owners, tenants, agencies and other interested parties. The Draft EIS/EIR was distributed to agencies and the public for 45-days public review (December 23, 1999 to February 7, 2000). Copies of the Draft EIS/EIR were made available at the public library for the public who wished to review it. The public hearing was conducted on January 19, 2000, at City Hall, City Council Chambers, Santa Barbara at 6:30 P.M. to solicit the public's concerns on the Draft EIS/EIR. The public was informed by mailing notices and publishing a notice in the local newspaper (see Appendix I-1, for correspondence). A summary of the public comments received during the public hearing is included in the Appendix I-2 of the EIS/EIR. Comment letters received on the Draft EIS/EIR and responses are located in the Appendix K. In accordance with NEPA (Section 1503.4(b) and CEQA (Section 15088), the USACOE, Santa Barbara County and the City of Santa Barbara reviewed the comment letters; appropriate responses are provided in Appendix K of the EIS/EIR. The text in the EIS/EIR has been revised to reflect public comments/responses. The revised text is marked with letter "**R**" in the left margin. The project description/mitigation measures have been modified in response to some the agencies/public comments. The following subsection summarizes public comments and brief responses. A list of the comment letters is provided below.

**Comments Received on the Draft EIS/EIR:**

1. United States Environmental Protection Agency
2. United States Department of the Interior
3. United States Coast Guard
4. California Governor's Office of Planning and Research, Clearinghouse
5. City of Santa Barbara Historic Landmarks Commission
6. City of Santa Barbara Architectural Board of Review
7. City of Santa Barbara Parks and Recreation Commission
8. City of Santa Barbara Parks and Recreation Department
9. Justin Ruhge, Concerned Taxpayers of Santa Barbara County
10. Robert Bernstein, Santa Barbara Bicycle Coalition
11. Edward Cella, President, De la Guerra Homeowners Association
12. Darlene Chirman, President, and Kendy Radasky, Santa Barbara Audubon Society
13. Richard A. Stromme, Railroad Advocates
14. Louise Boucher, Citizens Planning Association of Santa Barbara County
15. Eddie Harris, Urban Creeks Council
16. Maria Gordon, Small Wilderness Area Preservation
17. Brian Trautwein, Environmental Defense Center
18. Gabrielle and Jerome Boucher (letter #1)
19. Lisa Ann Kelly and Family
20. David Dates
21. Gail Pearce O'Brien
22. Jerome and Gabrielle Boucher (letter #2)
23. Eva Inbar
24. Dennis Hoey
25. Eduardo and Marite Gonzalez
26. Peter Gerlach
27. Antonio R. Romasanta, Harbor View Inn
28. Elihu M. Gevirtz
29. Lisa Torres
30. David Shelton and Alexandra C. Cole
31. Rita Gronhovd
32. Jana Zimmer
33. Kate Lundy
34. Teddy Gasser and Carlin Moyer
35. Charles I. Kline
36. Martin Landsfeld
37. J. D. Dale
38. John Poucher, Hollister and Brace, for Jacques Partners
39. F. Zambelli

R **Summary of the Public Hearing and Brief Responses to Comments**:

The U.S. Army Corps of Engineers (Corps), the Santa Barbara County Flood Control District (Flood Control District), and the City of Santa Barbara (City) held a public meeting on Wednesday evening, January 19, 2000, 6:30 PM, to give the public an opportunity to comment orally on the Draft Feasibility Study and Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR). The public meeting was held in the Council Chambers at Santa Barbara City Hall located at De la Guerra Plaza. A verbatim transcript of the public meeting

proceedings from a videotape was prepared; the transcript is on file at USACOE, Los Angeles District Office. Comments, and concerns raised at the public meeting and responses are provided in Section 2.5 of the Final EIS/EIR.

## COMPARATIVE IMPACTS OF ALTERNATIVES:

Table 3.6-1 of the EIS/EIR provides comparative impact analysis of the alternatives evaluated for the proposed project. Alternative 12 would provide maximum incidental environmental benefits, and it is an environmentally superior plan compared to the other viable alternatives considered during the feasibility study.

## RELATIONSHIP TO ENVIRONMENTAL PROTECTION STATUTES AND OTHER ENVIRONMENTAL REQUIREMENTS:

The proposed project is designed in compliance with environmental laws, Executive Orders, and other policies. Detailed descriptions and applicability of each regulation is provided in detail in Section 1 of the EIS/EIR. A list of these laws and regulations is provided below.

## FEDERAL:

National Environmental Policy Act of 1969 (Public Law 91-190) as amended.
Department of Army, Regulation 200-1 (AR 200-1)
Department of Army, Regulation 200-2 (AR 200-2).
ER-200-2-2, 33 CFR 230, March 1988.
ER-1105-2-100 Regulation December 1990
Clean Water Act of 1977 (Public Law 95-217).
Endangered Species Act of 1973 (Public Law 93-205), as amended
Fish and Wildlife Coordination Act of 1958 (Public Law 85-624).
Migratory Bird Treaty Act, as amended (16 USC 703-711)
Executive Order 11988, Floodplain Management, May 24, 1977.
Executive Order 11990, Protection of Wetlands, May 24, 1977.
National Historic Preservation Act of 1966 (Public Law 89-665 as amended December 12, 1980).
Clean Air Act (Public Law 91-604), as amended.
Executive Order 12898, Environmental Justice.
Farmland Protection Policy Act, December 22, 1981 (Public Law 97-98).
Federal Water Project Recreation Act (Public Law 89-72), July 9, 1965.
Wild and Scenic Rivers Act (Public Law 90-542, as amended through Public Law 96-580, December 23, 1980).
Executive Order 13045, "Environmental Health and Safety Risks to Children" (62 Fed. Reg. 1988s (1997)).
Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 USC § 4601 (1996)).
Coastal Zone Management Act (Public Law 92-583).

**STATE**:

California Environmental Quality Act (CEQA) (Public Resources Code §§22,000 et seq.).
California Coastal Act of 1976, as amended.
California Endangered Species Act (Cal. Fish and Game Code §§ 2050-2116).
Streambed Alteration Agreement (Cal. Fish and Game Code, § 1600).
Surface Mining and Reclamation Act of 1975 (SMARA) (Cal. Pub. Res. Code § 2710).

**LOCAL**:

The City of Santa Barbara General Plan and Local Coastal Plan Goals and Policies

R **COORDINATION WITH THE RESOURCE AGENCIES**:

Formal and informal coordination has been conducted with concerned resource agencies. The U.S. Fish and Wildlife Service (USFWS), National Marine Fishery Service (NMFS), Corps Regulatory Branch and California Department of Fish and Game (CDFG) have participated in the planning process. During preparation of the Final EIS/EIR, extensive coordination occurred with the concerned resources agencies, these agencies are: USFWS, NMFS, California Coastal Commission (CCC), CDFG and Corps Regulatory Branch. The USACOE developed additional mitigation measures to minimize impacts to the biological resources. Concerns of the resource agencies have been addressed to the maximum extent possible. A summary of coordination is provided in Section 1 of the EIS/EIR. A list of agencies contacted is provided below.

U.S. Fish & Wildlife Service (USFWS)
National Marine Fisheries Service (NMFS)
U.S. Army Corps of Engineers Regulatory Branch
California Regional Water Quality Control Board (CRWQCB)
California Department of Fish and Game (CDFG)
California Coastal Commission (CCC)
State Historic Preservation Officer (SHPO)
Santa Barbara County Air Pollution Control District

R In addition to the resource agencies, the USACOE and the City of Santa Barbara coordinated with the Environmental Defense Center (EDC), Urban Creek Council and Audubon Society staff. The USACOE and the City of Santa Barbara met with these concerned groups to provide a status of the project and updated mitigation measures (see detail in Section 1 of the EIS/EIR).

R **MAJOR CONCLUSIONS AND FINDINGS**:

The environmental effects of the proposed array of alternatives presented in the Main Feasibility Report and in the EIS/EIR, the Affected environment and impact analysis by each resource have been discussed in detailed in sections 6 through 19 of the EIS/EIR. Alternative 1, the No Action/No Project Alternative, represents the future without project condition. Alternative 12 is the National Economic Development (NED) and tentative recommended plan. Increasing environmental benefit opportunity is feasible with alternatives consisting of

stabilization of sideslopes with a combination of vertical walls and stepped walls or combination of vertical walls and riprap. During plan formulation study, twelve alternatives were formulated to provide flood protection to the city of Santa Barbara. Alternative 12 provides maximum opportunity for providing incidental environmental benefit by planting of native riparian vegetation, compared to all other viable alternatives. The EIS/EIR also includes impacts and mitigation measures related to the future maintenance activities. Mitigation measures are summarized in Section 24 and the Mitigation Monitoring Plan in the EIS/EIR. Since the release of the Draft EIS/EIR, the project design has been modified, extensive coordination occurred with the concerned resource agencies. The USACOE developed additional mitigation measures to minimize impacts to the biological resources. With the re-alignment of the project design, impacts to the cultural resources have been minimized. Coordination with the State Historical Preservation Officer (SHPO) under NHPA Section 106has been completed.

This EIS/EIR includes, as appropriate, consideration of impacts of initial construction and future periodic debris removal; cumulative impacts of the proposed action on the environment when added to reasonably foreseeable future actions/projects in the area; a summary of mitigation measures and environmental commitments; the relationship between short-term uses of man's environment and maintenance and enhancement of long-term productivity; and any irreversible or irretrievable commitment of resources which would be involved in the proposal should it be implemented. All of the alternatives, including Alternative 1, the No Action/No Project (future without project conditions) alternative, are discussed in chapters 6 through 19. Because none of the alternatives would have a detectable impact on local or regional climatic conditions, climate is discussed in this analysis only in the context of air quality impacts. All environmental resources, the existing condition and impacts related to each resource, are described in sections 6 through 19. Section 24 of the EIS/EIR summarizes project related mitigation measures/environmental commitments to minimize project related impacts. A survey of each resource was performed. After evaluation of each resource located within the project area, it was determined the project area does contain two significant resources, biological and cultural resources. Therefore, only these two resources have been discussed briefly in the following paragraphs.

R **Biological Resources:**

Two species of fish, both listed as Federally endangered, under the Endangered Species Act, utilize Mission Creek. The tidewater goby (*Eucyclogobius newberryi*) enters the creek from the coastal lagoon and forages as far upstream as the Yanonali Street Bridge. Tidewater gobies are normally present in the area from late spring through fall.

The second species, steelhead (*Oncorhynchus mykiss*), use the lower end of Mission Creek as a migratory channel when flow conditions permit. Adults could swim upstream after steady winter rains have raised runoff rates. The species evidently spawns successfully in some years in the upper reaches of the watershed. Juvenile steelhead would use Mission Creek through the project area only as a migratory corridor to the ocean. Lower Mission Creek, the area within the project area, does not afford rearing conditions or suitable spawning conditions for steelhead.

Isolated native trees of notable age still occur at various locations along the creek. Of these, six are western sycamores (*Platanus racemosa*) and one is a coast live oak (*Quercus*

*agrifolia*). Elsewhere along the creek, a young cottonwood (*Populus fremontii*) struggles to survive against the effects of periodic channel maintenance, and a few mature willows (*Salix lasiolepis*) and fewer still white alders (*Alnus rhombifolia*) have become established on the overbank.

The Moreton Bay Fig (*Ficus macrophylla*) is located east of Mission Creek, at an elevation about 7 feet higher than the channel.

The USACOE has revised a modified Habitat Evaluation Procedure (HEP) to evaluate project related loss of habitat during the preparation of the Final EIS/EIR. Calculations of the HEP analysis revealed that the implementation of the proposed/preferred Alternative will yield greater habitat quality and values compared with existing conditions. In HEP analysis, loss due to project construction and future maintenance has been included for the life of the project. Conclusions of that HEP have been discussed at length with the USFWS. The HEP analysis is located in Appendix C of the EIS/EIR. The USFWS has provided a Final Coordination Act Report for the implementation of the project, which is located in Appendix B of the EIS/EIR.

A Mitigation Monitoring plan is included in Appendix H.

R The preferred plan for bank stabilization, a riprap slope extending to the bank top from low channel walls, would allow planting of a narrow but viable corridor of native riparian vegetation. A canopy consisting of several species of native trees and an understory layer consisting of willows and other native perennial species would be planted. Overall, habitat restoration of Lower Mission Creek would restore a significant wildlife corridor to this coastal stream.

R Removal of concrete surfaces from many places along the creek and restoration of a natural bottom would enhance aquatic habitats along the creek. Placement of large boulders for the purpose of dissipating stream flow energy would also promote stream conditions favorable to all fish and benthic organisms. Expansion of the creek channel below Yanonali Street would increase the habitat available to tidewater gobies. Various structural adaptations of the walls would mitigate for unavoidable, but not significant effects on gobies and steelhead. These features and future maintenance techniques which have been developed, would yield an important measure of incidental ecological benefit.

R Construction of flood control structures along Mission Creek would cause significant, temporary impacts to the stream's bottom, and thereby to the low-quality aquatic habitat which exists along the channel. Similarly, significant and temporary impacts would occur to coarse, weedy vegetation along the banks. Solitary, stately native trees would be removed in two locations to accomplish construction.

Direct impacts to gobies would be minimized by slowly de-watering half the channel at a time to allow construction in dry conditions. This plan would entail enclosing half of channel at its lower end with sheet piling, then trapping as many fish as possible and removing them to the other side of the piling. The process would be repeated for the other half of the channel. Impacts to steelhead would be avoided, or minimized, by scheduling construction in the channel and along the banks during the summer and fall months, when steelhead would not normally be present.

Various mitigation measures have been included in the project design to minimize impacts to steelhead. The NMFS has provided a Final Biological Opinion on the tidewater goby for the proposed project (Appendix B-1 of the Final EIS/EIR). Conditions/mitigation measures identified in the Biological Opinion would be followed during project construction and future maintenance. The USACOE would continuously coordinate the project design with the NMFS during development of the final project design. The USFWS Biological Opinion for the steelhead has not yet been submitted. However, the Coordination Act Report has indicated that impacts on the Steelhead are likely to be less than significant. Any mitigation measures required by the Biological Opinion will be added to the project during final design.

Construction effects have the potential to damage small roots of the Moreton Bay Fig, but not the principal components of its root system. Construction would occur sufficiently far from it to avoid any direct impact to its buttress roots, trunk, or branches. The flood control structure should have no effect on subsurface water flow around the fig tree.

**Cultural Resources**:

Alternatives 6, 8, and 12 have the potential to require removal of a number of historic structures. The City of Santa Barbara awarded a contract to conduct an updated architectural survey of the affected environment in the area of potential effects (APE). The survey report, completed in November 1999, recommended buildings and structures which should be determined eligible for the National Register, California Register or local listing. There are potential adverse effects under the National Historic Preservation Act for Alternatives 6 and 8. There are none for Alternative 12. Mitigation of adversely affected historic properties under Alternatives 6 and 8, may consist of historic recordation of the locally significant historic properties, and possible relocation of important houses. Archeological and Native American monitors will be on-site during all ground disturbing activities to ensure that if any Native American materials or deposits are discovered, the Corps of Engineers and the City of Santa Barbara will be notified immediately.

**PERMIT REQUIREMENTS**:

Clean Water Act 404 (b)(1) Water Quality Evaluation has been prepared to evaluate discharge of fill or dredged material in the waters of the United States (Appendix E).

The Section 401, State Water Quality Certification, is waived for the project construction as identified in Section 404(r) regulation. The California Regional Water Quality Control has provided a waiver from the Section 401, Water Quality Certification for the project construction and future maintenance. Future maintenance is a part of the project and will be performed by the Local Sponsor. No separate environmental document would be prepared for the future maintenance, because impacts related to the future maintenance have been addressed in the Final EIS/EIR. The USACOE recommends a waiver from the Section 404, Regulatory Permit for the future maintenance.

A Pollution Prevention Plan will be prepared to meet Section 402 Clean Water Action and National Pollutant Discharge Elimination System (NPDES) Storm Water Program requirements prior to the project construction. The selected construction contractor will prepare

a Storm Water Pollution Prevention Plan to reduce erosion and degradation to waters of the United States.

The local sponsor is involved in this project; therefore, a 1603 Streambed Alternation permit would be required prior to construction and the County of Santa Barbara would need to submit an application to the California Fish and Game for the Streambed Alternation Permit. With completion of these actions, the project will comply with Federal and State water quality requirements.

R On December 20, 1999, the USACOE submitted a CCD with project description, HEP Analysis report, biological assessments, and Draft Coordination Act Report to CCC. Since submittal of the CCD, extensive coordination has occurred between USACOE, City of Santa Barbara and CCC staff. The CCC staff expressed their concerns for the project design, and required detailed project plans to examine the project features. In addition, they were concerned about construction of vertical walls within the coastal zone, impacts to water quality, non-point source discharge degrading water quality of the creek, goals, success criteria for the planted vegetation, impacts to endangered species, estuarine habitat, mitigation, sand supply, HEP analysis, visual resources and cultural resources. The CCC also desired to have biological opinions from both agencies, USFWS and NMFS to make their determination. The CCC recommended that the USACOE examine an alternative with vegetated riprap slope or a full vegetated riprap bank below the freeway. The USACOE performed a cursory economic analysis of these alternatives. Results of this conceptual analysis can be found in the Economic Appendix. These alternatives are not economically feasible.

The biological opinion from the USFWS has not received, therefore, the USACOE requested postponement of the public hearing on the CCD until February 2001 or until the biological opinion is received from the USFWS. The USACOE has revised the CCD to incorporate revised project design, mitigation measures and coordination/input received from the CCC staff. The revised CCD can be found in Appendix D of the Final EIS/EIR. The USACOE will make every effort to provide requested information to facilitate the CCC in drafting a staff report/recommendation of the proposed project. Prior to project construction, concurrence from the CCC would be obtained. Therefore, the project would comply with the CZMA.

Two revised Biological Assessments have been prepared for the Federally listed Endangered and Threatened species (Appendix A-EIS/EIR). The Corps has initiated formal Section 7 with the USFWS and NMFS. A Biological Opinion for steelhead has been received from the NMFS. A Biological Opinion from the USFWS will be obtained prior to signing of the Record of Decision.

# SECTION - 1 - INTRODUCTION

## 1.1 STUDY LOCATION:

The Mission Creek drainage area is located in and adjoining the city of Santa Barbara, California, about 100 miles west of the City of Los Angeles. The drainage area, comprising about 11.5-square miles, is a narrow coastal area and extends from the Santa Ynez Mountains on the north to the Pacific Ocean on the south. Mission Creek rises at about 4,000 feet elevation and flows about 8 miles through the City of Santa Barbara to empty into the Pacific Ocean (see Figure 1.1-1). The scope of this study is to evaluate potential benefits, impacts and necessary mitigation requirements associated with flood control measures within the Lower Mission Creek Area. The study is limited to the final 1.2 miles of the creek, from just downstream of Canon Perdido Street to Cabrillo Boulevard (see Exhibit 2 of the Main Report). Please refer to Section 3.5 of the Environmental Impact Statement and Environmental Impact Report (EIS/EIR) for the detailed project description.

## 1.2 PURPOSE AND SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT (EIS) AND ENVIRONMENTAL IMPACT REPORT (EIR):

The purpose and scope of this EIS/EIR and Feasibility Study is to: (1) define the flood problems in the Lower Mission Creek Drainage area in Santa Barbara; (2) identify potential solutions; (3) develop a preferred plan and viable alternatives; (4) evaluate environmental impacts for the preferred plan and viable alternatives; (5) incorporate the city of Santa Barbara General Plan and Local Coastal Plan Goals and Policies for each environmental resource in evaluating each alternative including the preferred plan; and (6) develop possible mitigation measures to offset project related impacts. The proposed flood control alternatives for Lower Mission Creek will contribute to national economic development (NED) by reducing the flood losses in the area and protecting the nation's environment. Guidance for this purpose is specified in ER 1105-2-100, "***Guidance for Conducting Civil Works Planning Studies***." The EIS/EIR is prepared in compliance with the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA) and other Federal, State and Local environmental regulations.

The U.S. Army Corps of Engineers (USACOE) conducted a feasibility level study, in cooperation with the Santa Barbara County Flood Control and Water Conservation District (SBCFC&WCD) and the City of Santa Barbara, of the flooding problem along Lower Mission Creek, Santa Barbara, California. The City of Santa Barbara has an inter-governmental agreement with the SBCFC&WCD to share the non-federal cost of the study and to act as lead agency under CEQA. The proposed project is authorized by Section 209 of the Flood Control Act of 1962 (Public Law 87-874, 87th Congress, 2nd session), approved October 23, 1962. The study identifies, describes, and evaluates feasible plans and fully develops the recommended plan to be submitted to Congress for project authorization. At the request of the local sponsor, the study area has been limited to the final 1.2 miles of creek reaches. The study includes the area just downstream of Canon Perdido Street to the Cabrillo Boulevard Bridge. A previous USACOE Feasibility Study conducted in 1986 revealed that sediment detention measures are not economically feasible. Given the economic infeasibility and considering local opposition to any

form of sediment detention, no detention basin is being considered in this study. The scope of investigation has been further limited to the evaluation of a locally developed alternative, as well as any new alternatives not previously analyzed by the USACOE. The study also includes opportunities to increase ecological values (see details in Section 3 of the EIS/EIR).

The proposed alternative plans consist of creek improvements from Canon Perdido Street to Cabrillo Boulevard. The improvements include short vertical walls with stabilized banks above at a 1.5:1 (V:H) slope above Highway 101 while, below Highway 101, vertical walls would be the dominant bank treatment with sloped banks applied whenever practicable.

## 1.3 PREVIOUSLY PREPARED ENVIRONMENTAL DOCUMENTS:

Previous studies of the flood problem in Lower Mission Creek include an August 1986 Feasibility Statement/Environmental Impact Statement. That report concluded by recommending channelization of Lower Mission Creek. A Design Memorandum for a rectangular concrete channel, along with a Supplemental EIS (SEIS), was being prepared; however, a detailed design analysis of this alternative indicated that excess sediment would occur in the constructed channel. Therefore, this plan was not implemented. This new feasibility study focuses on alternative solutions, including a locally-preferred semi-natural channel design with possible opportunities for improving the aesthetics of the creek and increasing planting of native and riparian vegetation within the project reach.

This EIS/EIR briefly discusses the existing environment along the lower reaches of Mission Creek, and identifies the primary environmental concerns regarding channelization or other potential flood control alternatives. The EIS/EIR also identifies opportunities for incidental environmental benefits by planting native and riparian vegetation along the upper banks, within habitat expansion zones, construction of a natural bottom channel, enhancing estuarine habitats, and improving recreational opportunities in Lower Mission Creek.

## 1.4 BACKGROUND AND HISTORY OF THE PROPOSED ACTION:

Mission Creek is the largest stream in the City of Santa Barbara. The principal tributary of Mission Creek is Rattlesnake Creek, which joins the mainstem about a quarter mile above Foothill Road. Flows along Rattlesnake Creek and Mission Creek are either ephemeral or interrupted. These streams contain water during the rainy season and have minimal flows the rest of the year, consisting mainly of isolated pools receiving flows from subsurface run-off. Surface water is usually found year round in the Mission Creek headwaters and estuary. The U.S. Army Corps of Engineers (USACOE) has been involved in this project since 1964. A summary of the USACOE involvement is listed below:

| | |
|---|---|
| 1962 | Congress authorized study of flooding problems on Mission Creek. |
| 1964 | First Army Corps of Engineers (USACOE) involvement on Mission Creek. Following the Coyote Fire, debris dams were installed on Mission and Rattlesnake Creeks. |
| 1969 | USACOE prepared a Feasibility Study for the proposed channelization of Mission |

Creek for flood control purposes. This proposal consisted of constructing 12 miles of channel and diversion of flood flows to Arroyo Burro Creek. This plan was not accepted by the local community, because the plan was insensitive to environmental values, especially in the reach upstream from State Street and through Oak Park and along Arroyo Burro Creek. The construction of a channel would have resulted in a significant loss of biological and aesthetic resources.

1970 The project was authorized by the U.S. Congress. The USACOE conducted further studies in coordination with the City of Santa Barbara Environmental Quality Advisory Board. Various alternatives were developed, but the USACOE and the advisory board could not agree on a solution to the flood problems along Mission Creek. The project was put on hold due to community concerns about environmental impacts.

1973-75 A Flood Plain Information report covering streams in the City of Santa Barbara (including Mission Creek) was prepared in April 1975. USACOE worked with the City Environmental Quality Advisory Board to develop flood control alternatives for Mission Creek. No plan acceptable to both USACOE and local interests was found. Concerns focused around the impacts of channelization on biological resources and aesthetics.

1978 Under the authority of the National Flood Insurance Act of 1968, a Flood Insurance study covering streams in the City of Santa Barbara, including Mission Creek, was prepared in June 1978. Flood Insurance Rate Maps were prepared in December 1978. The Study and Maps enabled the City of Santa Barbara to convert to the regular program of flood insurance by the Federal Insurance Administration and to aid local and regional planners in their efforts to promote sound land use and flood plain development.

1978-1980 The City and County requested assistance from the USACOE following substantial flooding in 1978 and 1980. The City of Santa Barbara believed that a feasible plan could be developed through public participation and an examination of alternatives.

1982 The USACOE met with County Flood Control to develop a process for review of a possible flood control project.

1983 April - Citizen's Advisory Committee established by City Council to work with USACOE to select a project which meets both flood control needs and community concerns. The Committee met 13 times over a period of three years.

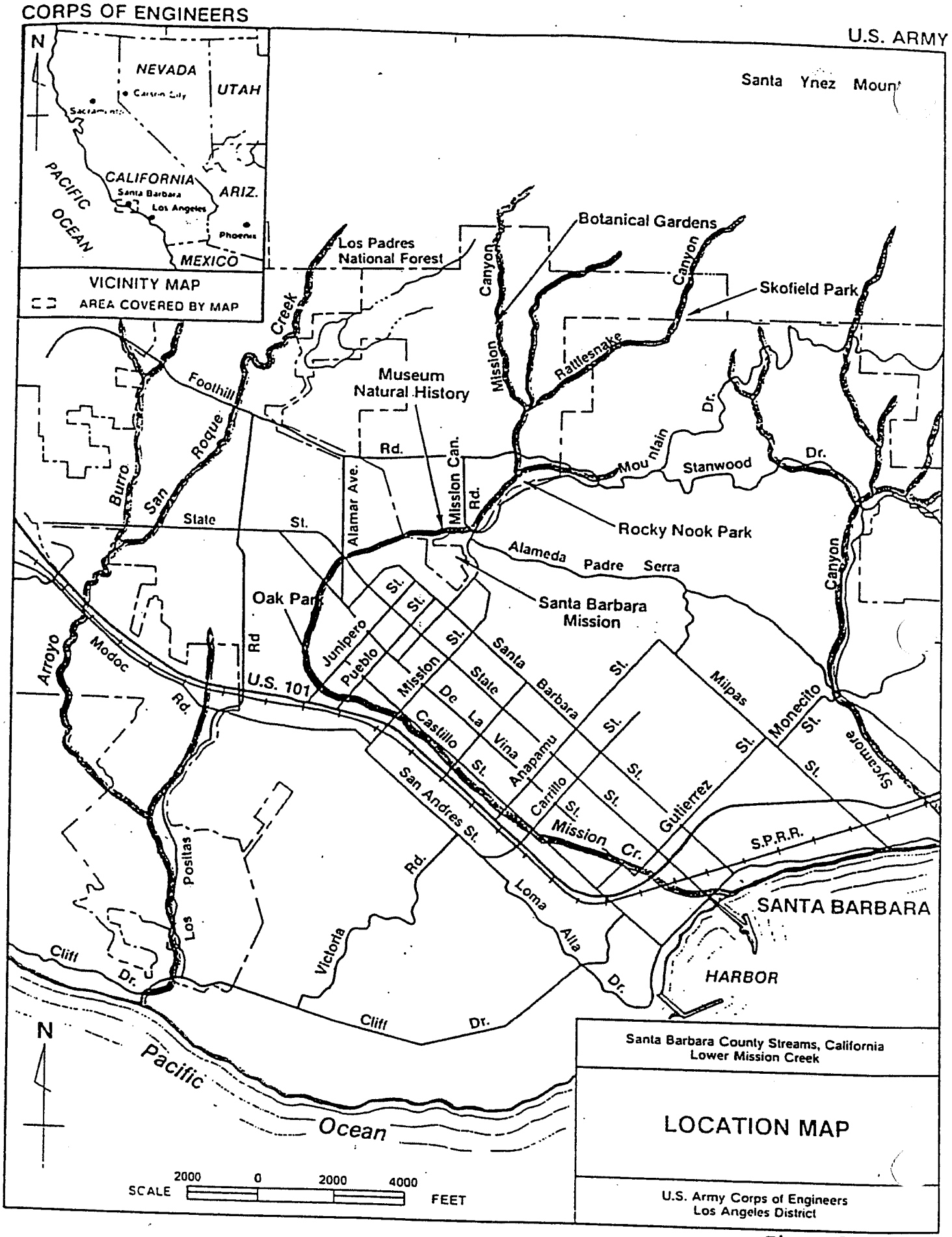
CORPS OF ENGINEERS
U.S. ARMY
N
NEVADA
UTAH
CALIFORNIA
ARIZ.
MEXICO
PACIFIC OCEAN
Santa Barbara
Los Angeles
Phoenix
VICINITY MAP
AREA COVERED BY MAP
Santa Ynez Mount
Botanical Gardens
Los Padres National Forest
Skofield Park
Museum Natural History
Foothill
Burro
San Roque
Creek
Mission Canyon
Rattlesnake Canyon
Mountain Dr.
Stanwood Dr.
Rocky Nook Park
Alameda Padre Serra
Santa Barbara Mission
Oak Park
Alamar Ave.
Mission Can. Rd.
State St.
Junipero
Pueblo
Mission
De La Vina
Santa Barbara
State
Anapamu
Carrillo
Castillo
San Andres St.
Milpas
Monecito
Sycamore
Gutierrez
Mission Cr.
S.P.R.R.
Arroyo Modoc Rd.
U.S. 101
Los Positas Rd.
Victoria Rd.
Loma Alta Dr.
Cliff Dr.
SANTA BARBARA
HARBOR
Pacific Ocean
SCALE
2000 0 2000 4000
FEET
Santa Barbara County Streams, California
Lower Mission Creek
LOCATION MAP
U.S. Army Corps of Engineers
Los Angeles District

Figure 1.1-1

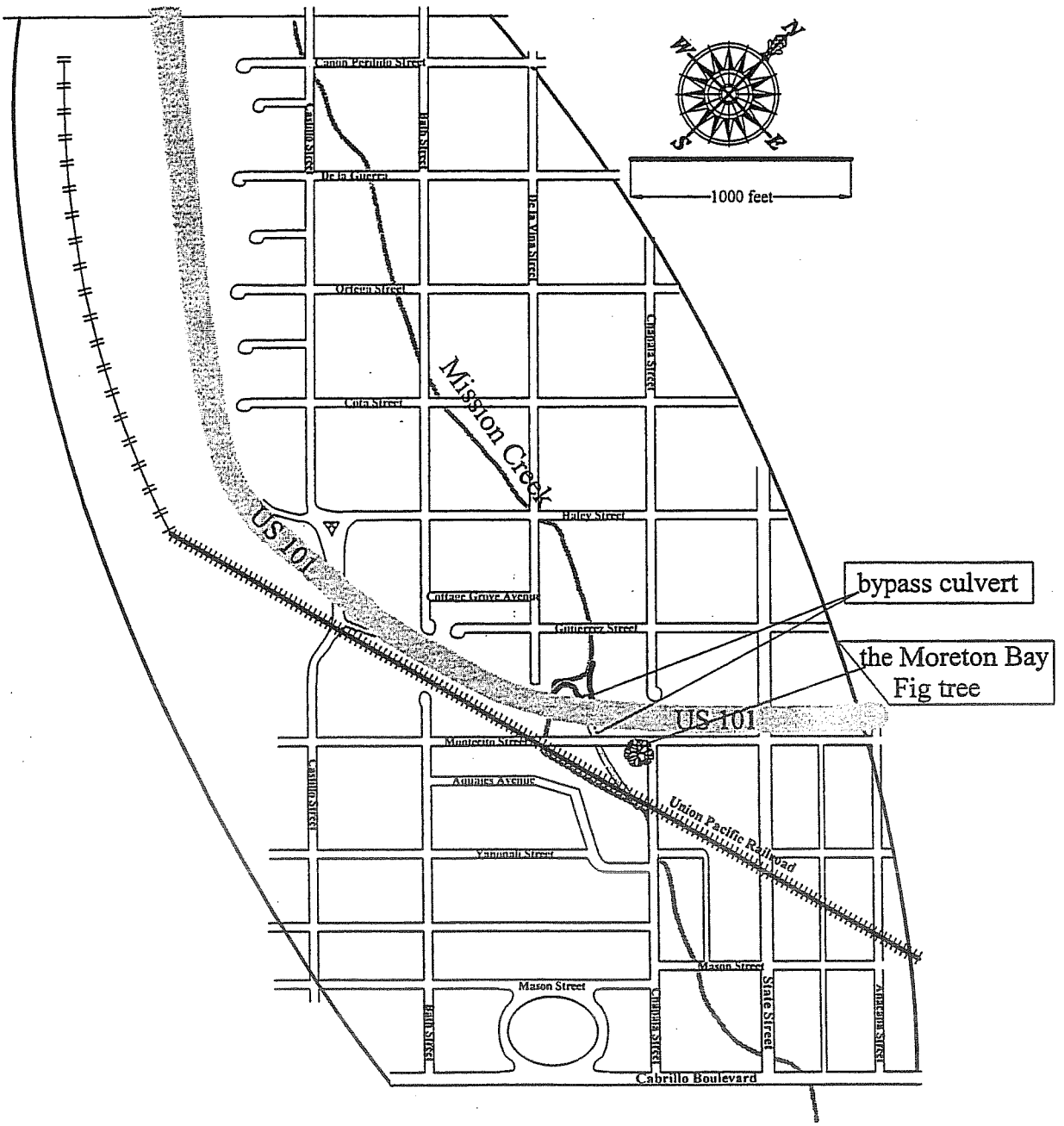


Figure 1.1.2: Study Area Map: the lower-most reach of Mission Creek in the City of Santa Barbara.

| | |
|---|---|
| 1986 | June - Citizen's Advisory Committee recommended the Lower Mission Creek Project to City Council. This project was fully concrete-lined and provided 100-year flood control. No debris basins were included in the design. |
| | July - The City Council, Planning Commission and the County Board of Supervisors conceptually endorsed The Lower Mission Creek Project. |
| | August - Feasibility Study and Final Environmental Impact Statement completed by USACOE. This study included several structural, non-structural and No-Action Alternatives. The alternative recommended in this study, referred to as the Lower Mission Creek Project, was authorized by Congress in the Water Resources Development Act of 1988. |
| | August - City Council formed a Mission Creek Alternatives Task Force to look at other alternatives to the project, based on public concerns regarding the endorsed project. |
| 1987 | January - USACOE issued its Record of Decision approving the project. |
| 1987 | The Mission Creek Alternatives Task Force reviewed and rejected an insurance alternative because it would not provide adequate coverage if a flood occurred before enough money could be collected to buy properties in the flood area. In addition, it was illegal for the City to carry out such an insurance scheme. |
| 1988 | Mission Creek Alternatives Task Force received a grant from the State Dept. of Water Resources under the Urban Streams program to pursue other structural flood control alternatives. Spectra Information & Communications was hired by the City to prepare the report. |
| 1989 | Spectra report released. Based on a different flood flow rate calculation methodology, the report proposed alternatives for Lower Mission Creek that would be more natural in design, including a natural bottom and gabion sides with the amount of allowed vegetation to be based on the proposed width. |
| 1989-93 | USACOE worked on Preliminary Engineering and Design for the endorsed project. |
| 1992 | July - Scoping Meeting for Joint Supplemental EIS/EIR held before the City Environmental Review Committee. Work begins on preparation of environmental document. |
| | September - Request for Proposal distributed by the City to complete peer review of project design with emphasis on the rate of flood flow, the effect of siltation on project design and the impacts on groundwater recharge. |
| | December - Selection of David Dawdy to provide peer review. |

1993 March - Cost sharing agreement between City and County Flood Control for environmental review, project administration, local engineering, preliminary appraisal and other costs; also includes designation of the City as lead agency under CEQA. Approval of contract with David Dawdy for peer review and Interface for air quality and noise studies.

1993 July - Letter from USACOE proposing to place the project on inactive status due to debris control issues. All work on EIR/SEIS stopped.

September - Establishment of Mission Creek Consensus Group to develop an alternative that is acceptable to the community as a whole. Membership includes Board of Supervisors and Council members and representatives of the environmental community and business/property owners.

1993-94 A series of Consensus Group meetings to determine criteria for an acceptable flood control project, review and preparation of a report by Kennedy/Jenks regarding economic and environmental feasibility of various alternatives and selection of alternatives for further study.

1994 September - Presentation of Consensus Group recommended alternatives to the Board of Supervisors and City Council. Letter sent to USACOE requesting that a Reconnaissance Study regarding the feasibility of the recommended alternative be prepared.

December - Public Workshop held by USACOE to gather input for Reconnaissance Study.

1995 November - USACOE, Santa Barbara County Streams - Lower Mission Creek Reconnaissance Flood Control Study.

1997 August - Public Workshop held by USACOE to gather input for Feasibility Study.

1998 October - Scoping Hearing held by USACOE and the City to gather input on environmental impacts to be considered in the EIS/EIR.

## 1.5 NEPA AND CEQA COMPLIANCE:

The U.S. Army Corps of Engineers (USACOE), the Santa Barbara County Flood Control and Water Conservation District (SBCFC&WCD) and the City of Santa Barbara are responsible for the preparation of Environmental Impact Statement (EIS) and Environmental Impact Report (EIR). The USACOE is a Federal agency; Santa Barbara County, the local sponsor, is a local agency. Therefore, the proposed project needs to comply with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ), and the California Environmental Quality Act (CEQA). Because the entire project is within the incorporated limits of the City of Santa Barbara, the County and the City agreed that the City would act as the Lead Agency under CEQA. The NEPA and CEQA regulations require evaluation of all environmental resources for the preferred alternative and all feasible alternatives. To offset project related impacts, appropriate mitigation measures are included in this document.

The study assesses and evaluates present and future without-project conditions, project alternatives, future maintenance, beneficial and adverse impacts (physical environment, land use, geology, biology, air quality, water quality, groundwater, recreation, aesthetics, cultural resources, transportation/communications, hazardous waste, socioeconomics and safety) of the proposed alternatives, and development of mitigation measures, to reduce the project related impacts. Study results and recommendations are coordinated fully with the concerned resource agencies.

### 1.5.1 NEPA/CEQA Process

Federal funding for the planning, design, and construction of the Lower Mission Creek Project is provided jointly by the USACOE and SBCFC&WCD. The Santa Barbara County Flood Control District is responsible to perform all activities associated with operation and maintenance of the project. The involvement of a federal agency and a local agency requires compliance with both NEPA and CEQA. As per 40 CFR 1505.2 of NEPA and Section 15170 of CEQA, the USACOE, the City of Santa Barbara and SBCFC&WCD have prepared this joint EIS/EIR. The procedure for NEPA and CEQA is depicted in Table 1-1.1.

**Notice of Intent and Notice of Preparation**:

The USACOE and the City of Santa Barbara began the scoping process for the project by publishing a Notice of Intent (NOI) in the Federal Register and distributed Notices of Preparation (NOP) to potentially affected agencies and the public. The NOI and NOP were prepared and published in the Federal Register and local newspaper respectively on October 13, 1998. (See details for NOI and NOP in Section 2.4.1 of this EIS/EIR and included in Appendix I of the EIS/EIR.)

**Draft EIS/EIR Procedure**:

R The Draft EIS/EIR was distributed for public review and comment in accordance with the federal (NEPA) and state (CEQA) processes. Copies were submitted to the U.S. Environmental Protection Agency (EPA) and State Clearinghouse for agency distribution. The Draft EIS/EIR was distributed to all concerned federal, state and local agencies, environmental groups, and interested individuals. Copies of the EIS/EIR were available at area public libraries for the interested public to review. The USACOE filed the Draft Feasibility Report and the EIS/EIR with the Environmental Protection Agency. A Notice of Availability (NOA) of the Draft EIS/EIR was published in the Federal Register on December 23, 1999. The City of Santa Barbara published a notice in a newspaper of the availability of the Draft EIS/EIR to comply with CEQA Regulations. The City also sent a NOA to the State clearing house, concerned agencies, property owners and other concerned parties on December 23, 1999. The public review was initiated on December 23, 1999 for 45-days. The date, time, and location of the public hearing were announced in the local newspapers. A Notice of Public Review and Public Meeting was distributed to affected property owners, tenants and interested parties. The Public Meeting (Hearing) was conducted on January 19, 2000 at Santa Barbara, in the Council Chambers at Santa Barbara City Hall. Comment and responses on the Draft EIS/EIR can be found in Appendix K of the Final EIS/EIR (see details in Section 2 of the EIS/EIR). The Final EIS/EIR will be filed with the EPA and certified by the City of Santa Barbara. All correspondence related

to the release of the Draft EIS/EIR and Public Hearing are located in the Appendix I-1.

**Final EIS/EIR Procedure**:

Following completion of the Final EIS/EIR, the document will be distributed to agencies, organizations, and persons that submitted comments on the Draft EIS/EIR. A NOA will be published in the Federal Register, local newspapers and sent to interested agencies, property owners and other concerned parties stipulating that the Final EIS/EIR will be available for a 30-day public review period prior to signing a Record of Decision (ROD). The ROD is a written public record explaining why the USACOE has chosen a particular course of action. A summary of the selected alternative and mitigation measures to minimize or avoid environmental impacts will be identified in the ROD. Similarly, the Santa Barbara City Planning Commission will certify that the EIR has been completed in compliance with CEQA, and the City Council and the Board of Supervisors will state that they reviewed and considered the information in the EIR prior to approving the project (CEQA Guidelines, Section 15090). The County and City must indicate its support of the project in order for the USACOE to pursue Project Engineering and Design. A cost-sharing agreement would be prepared and signed by the USACOE and SBCFC&WCD prior to project construction. Construction of the proposed project cannot be initiated before the ROD is signed and approved, the Final EIR is certified, and the specific CEQA findings are adopted.

**TABLE 1.1-1**

**NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)**
**CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) - PROCEDURE FOR**
**ENVIRONMENTAL IMPACT STATEMENT AND ENVIRONMENTAL IMPACT REPORT**

| NEPA: | CEQA: |
|---|---|
| NEPA applies to all federal agencies. Federal agencies shall prepare an environmental document to disclose project related impacts and provide mitigation to minimize impacts. | CEQA requires all California public agencies to comply with both procedural and substantive requirements. The agency shall prepare an environmental document to disclose project related impacts and provide mitigation to minimize impacts. |
| Determine Lead/Co-lead and Cooperating Agencies. | Determine Lead, Responsible and Trustee Agencies. |
| Publish Notice of Intent (NOI)-The first formal step in EIS preparation. | Prepare Initial Study. |
| Publish NOI in the Federal Register | Prepare Notice of Preparation (NOP). File with the State Clearinghouse and Responsible Agencies. Provide 30 days for review. Provide legal notice in a newspaper. Invite public comments on the scope of the EIR analysis. |
| Conduct Scoping Process (Public Participation) | Early consultation. Scoping meetings. |
| Prepare Draft EIS (Analysis of the preferred and viable alternatives and development of mitigation measures to minimize impacts). Include requirements for and analysis of required permits (CCD, 404/401 and others applicable to the project). | Prepare Draft EIR analysis of the preferred alternative. Identify project impacts and mitigation. Identify residual and cumulative impacts. Identify environmentally superior alternative. CEQA includes substantive provisions requiring agencies to avoid or mitigate impacts disclosed in an EIR. Provide mitigation monitoring plan. Analysis of permit requirements is necessary for CEQA documents. |

| | |
|---|---|
| File Draft EIS with EPA (EPA publishes notice of availability in the Federal Register) | Submit 10 copies of EIR to the State Clearinghouse, which distributes copies to interested agencies. Public notice announcing Draft EIR availability for review issued to the County Clerk. The local agency provides legal advertisement in the newspaper of the availability of the Draft EIR. |
| Circulate Draft EIS for public review (45 days from the date appeared in the Federal Register for the EIS review) | Circulate Draft EIS for public review and responsible agencies (45 days from the date appeared in the newspaper and filing with the State Clearinghouse). |
| Public Hearing after distribution of the Draft EIS to obtain public concerns on the Draft EIS, including proposed alternatives. | CEQA does not require public hearing during Draft EIR public review period. However, most agencies require such hearings, including the City of Santa Barbara. |
| Incorporate verbal and written comment/response in the EIS. | Incorporate comment/response in the EIR. Prepare Final EIR. |
| Circulate Final EIS for public review (provide copies to the agencies/public which provided comments-30 days) | Provide comment/responses to the agencies who provided comments on Draft EIR at least 10 days prior to certifying the Final EIR. |
| File Final EIS with EPA. Comment period starts from the date the Notice of Availability appears in the Federal Register. | City Planning Commission, acting as the Lead Agency under CEQA, certifies Final EIR. |
| Prepare Record of Decision (ROD). The ROD identifies project features/alternatives, findings, public concerns and mitigation. The USACOE higher authority signs the ROD prior to implementation of the project construction. | Make agency decision (City Council and Board of Supervisors). CEQA requires agencies to prepare statement of overriding considerations at the time of project approval if impacts cannot be mitigated to less than significant. Prepare Findings of Fact for each significant impact identified in the EIR. Findings are written statements made by the decision-making bodies of the Lead and Responsible Agency |

## 1.6 COMPLIANCE WITH APPLICABLE FEDERAL AND STATE STATUTES:

The following environmental laws, Executive Orders, and other policies have been considered in the planning process as noted below:

**FEDERAL:**

**National Environmental Policy Act of 1969 (Public Law 91-190) as amended.** This EIS has been prepared in accordance with the requirements of NEPA of 1969 (42 USC 43221, as amended) and the CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508), dated 1 July 1988. NEPA requires that agencies of the Federal Government shall implement an environmental impact analysis program in order to evaluate "major federal actions significantly affecting the quality of the human environment." A "major federal action" may include projects financed, assisted, conducted, regulated, or approved by a federal agency. NEPA regulations are followed in the preparation of this EIS.

**ER-200-2-2, 33 CFR 230, March 1988.** This regulation provides guidance for implementation of the procedural provisions of the National Environmental Policy Act (NEPA) for the Civil Works Program of the USACOE. It supplements Council on Environmental Quality (CEQ) regulations 40 CFR 1500-1508, November 29, 1978, in accordance with the CEQ regulations. Wherever the guidance in this regulation is unclear or not specific, the reader is referred to the CEQ regulations. This regulation is applicable to all USACOE responsibility for preparing and processing environmental documents in support of civil works functions.

**ER-1105-2-100 Regulation April 2000.** ER-1105-2-100 provides guidance for conducting Civil Works planning studies and related programs by the U.S. Army Corps of Engineers. Guidance provided in these regulations has been followed in the preparation of this document.

**Clean Water Act of 1977 (Public Law 95-217).** The Clean Water Act governs discharge or dredge of materials in the waters of the United States and it governs pollution control and water quality of waterways throughout the U.S. Its intent, in part, is to restore and maintain the biological integrity of the nation's waters. The goals and standards of the Clean Water Act are enforced through permit provisions. Sections 404, 401 and 402 of the Clean Water Act pertain directly to the proposed project. Section 404 outlines the permit program required for dredging or filling the nation's waterways.

The USACOE does not issue itself a permit for civil works projects. Therefore, a Section 404(b)(1) analysis is prepared and included in the EIS/EIR Appendix E. Section 404(b)(1) addresses project related impacts to the waters of the United States and provides appropriate mitigation measures to minimize impacts. Section 230.10(a)(2) of the 404(b)(1) guidelines states that "an alternative is practicable if it is available and capable of being done after taking into consideration costs, existing technology and logistics in light of overall project purposes". A future maintenance plan is included in the EIS/EIR, and impacts related to future maintenance are identified. Mitigation measures for future maintenance for the life of the project are included in the EIS/EIR. Santa Barbara County must follow all the environmental commitments identified in the EIS/EIR for future maintenance. In the future, if conditions change or new endangered and threatened species are listed, the local sponsor will need to coordinate with the appropriate resource agencies regarding new species introduced in the project area and perform

compliance with the environmental regulations.

R On December 20, 1999, Santa Barbara County submitted an application for a Section 404,USACOE Regulatory, permit with the Draft EIS/EIR. A General Permit could be renewable at intervals of 5 to 10 years or Section 404, or Regulatory Permit for Water Quality, could be waived under 404 (r) regulations. Future maintenance is an integral part of the project design, impacts and mitigation measures for future maintenance are included in the Final EIS/EIR. The EIS/EIR would be submitted to Congress for authorization of the project construction and appropriation of funding.

Section 404(r) of the Clean Water Act, waives the requirement to obtain either the State Water Quality Certification or the 404 permit if:

*"The requirement to obtain Section 401 Water Quality Certification for the project construction is waived if information on the effects of the discharge of dredged or fill material into waters of the United States, including the Section 404 analysis, is included in an EIS/EIR submitted to Congress before Congress authorizes the project or appropriates funds for construction."*

R On December 20, 1999, the USACOE and the Santa Barbara County Flood Control District submitted a request for a waiver from the Section 401 Water Quality Certification (Appendix E-1) for project construction and future maintenance. Future maintenance is a part of the project. By letter dated February 2, 2000, the California Regional Water Quality Control Board (CRWQCB) provided a waiver from the Section 401Water Quality Certification for the project construction and the future maintenance (Appendix E-1).

R Coordination with USACOE Regulatory Branch is on going. A working copy of the F-4package has been provided to the Regulatory Field Office (Ventura) for their review. The USACOE follows a policy guideline (ER-200-2) to accomplish the study of any flood control project (Water Resources Projects). Various milestone for a feasibility study need to be met (from F1 to F9) in order to accomplish the objectives and construction of the project. The F4 is one of the milestones to be accomplished; it includes baseline conditions, initial analysis of technically feasible alternatives. The Regulatory Branch requested a Mitigation Monitoring Plan for project implementation and future maintenance. On June 22, 2000, the Environmental Resources Branch provided an updated Project Description, Mitigation Monitoring Plan, revised Biological Assessments (for steelhead and tidewater gobies) and revised Hydraulics/Engineering Analysis to the Regulatory Branch.

Coordination with the California Regional Water Quality Control Board (CRWQCB) was performed during preparation of the Draft EIS/EIR. The Section 404(r) regulation was forwarded to the CRWQCB on November 9, 1999 (see details in coordination section of the Draft EIS/EIR). The USACOE will also coordinate with the CRWQCB for requirements of the National Pollutant Discharge Elimination System (NPDES) and storm water program prior to project construction. On June 21, 2000, the USACOE provided a package to the CRWQCB of the revised project description, mitigation monitoring plan, revised biological assessments and hydraulic/engineering analysis and project plans and drawings for their information.

A Notice of Intent will be submitted to the California Sate Water Resources Control Board to comply with Section 402 of the Clean Water Act. A Storm Water Pollution Prevention Plan (SWPPP) will be prepared to meet the State's requirements of the NPDES Storm Water Program prior to project construction. The construction contractor will prepare the SWPPP and have it available on the project construction site.

**Endangered Species Act of 1973 (Public Law 93-205), as amended**. As an early planning tool, the USACOE requested a Planning Aid Letter from the U.S. Fish and Wildlife Service (USFWS), a letter which would address potential concerns for all threatened, endangered, and candidate species recognized in the general vicinity. USFWS replied March 26, 1997 (Appendix B). Five species, either Federally endangered or threatened, inhabit the project area: tidewater goby (*Eucyclogobius newberryi*), steelhead trout (*Oncorhynchus mykiss*), brown pelican (*Pelicanus occidentalis*), western snowy plover (*Charadrius alexandrinus nivosus*), and California least tern (*Sterna antillarum browni*). The red-legged frog (*Rana aurora draytoni*) also appears on that list, but the Service later concluded this threatened amphibian does not occur within the project area (Sanders, 1998).

During preparation of the Draft EIS/EIR, the USACOE has prepared two biological assessments to evaluate project construction and future maintenance related impacts on fish species protected under the law and to initiate formal Section 7 Consultation with both USFWS and National Marine Fisheries Service (NMFS). Biological Assessments, dated December 1999 are located in Appendix A of the Draft EIS/EIR. The first pertains to potential impacts to the tidewater goby. It describes measures to minimize adverse effects and expansion of feeding habitat which could offset unavoidable incidental take of gobies. The second pertains to steelhead. It describes measures which should avoid all impacts to this species.

R After publication of the Draft EIS/EIR, the project design was modified due to hydraulic/engineering, real-estate constraints, and resource agencies concerns. Additional structural features and mitigation measures were incorporated in the project design and project description. To reflect these changes, the USACOE revised the biological assessments for both Federally listed species, steelhead and tidewater gobies. Revised biological assessments were submitted to both agencies, NMFS and USFWS, on June 16, 2000 and June 21, 2000, respectively (See Appendix A of the Final EIS/EIR). By letter dated August 2, 2000, the NMFS provided a Final Biological Opinion for the project construction and the future maintenance (Appendix B-1). The USFWS requested for additional information to determine project related impacts to the tidewater gobies. The biological opinion from the USFWS is pending. Prior to implementation of project construction, a biological opinion would be obtained. Conditions identified in the biological opinion would be followed during project construction and future maintenance. Therefore, the proposed project will comply with the requirements of the Endangered Species Act.

**Fish and Wildlife Coordination Act of 1958 (Public Law 85-624)**. In response to the requirements of this Act, the USACOE is coordinating with the USFWS and the California Department of Fish and Game (CDFG) during the initial and current stages of planning. The USFWS provided a Draft Coordination Report on October 6, 1999. A Final Coordination Act Report was provided on May 3, 2000 (Appendix B-1) which evaluates two potential flood control alternatives and the environmental benefits arising from these flood control designs. During preparation of the Draft EIS/EIR, a Biological Assessment was prepared and included in

Appendix A of the Draft EIS/EIR and other correspondence with the USFWS is located in Appendix B-1. The USACOE has coordinated extensively with the USFWS, NMFS and CDFG in the development of the proposed alternatives and mitigation measures. The USFWS and NMFS agencies participated the site visits, providing direct or indirect input in preparation of the HEP analysis. These agencies participated in the F-4 and the Alternative Formulation Briefing (AFB) conference and provided their input to protect biological resources.

R Coordination with the with the USFWS, NMFS and CDFG is on going. The USACOE revised the biological assessment for the tidewater gobies. On June 21, 2000, a revised biological assessment, revised project description, mitigation monitoring plan, and hydraulics/engineering analysis were provided to the USFWS.

**Migratory Bird Treaty Act, as amended (16 USC 703-711).** Requires management and protection of migratory birds. The Migratory Bird Treaty Act (1916), agreed upon between the United States and Canada; the Convention for the Protection of Migratory Birds and Animals (1936), agreed upon between the United States and Mexico; and subsequent amendments to these Acts provide legal protection for almost all breeding bird species occurring in the United States. These Acts restrict the killing, taking, collecting, and selling or purchasing of native bird species or their parts, nests, or eggs. Certain game bird species are allowed to be hunted for specific periods determined by federal and state governments. The intent of the Act is to eliminate any commercial market for migratory birds, feathers, or bird parts, especially for eagles and other birds of prey. The proposed project complies with this Act.

**Executive Order 11988, Floodplain Management, May 24, 1977.** Under this Order, the USACOE shall take action to avoid development in the base (100-year) floodplain unless it is the only practicable alternative; to reduce hazards and risks associated with floods; to minimize the impact of floods on human safety, health and welfare; and to restore and preserve the natural and beneficial value of the base floodplain. A determination has been made that no practicable alternative exists to location of the project in the floodplain of Lower Mission Creek.

**Executive Order 11990, Protection of Wetlands, May 24, 1977.** Section 2 of the Order states that each agency shall avoid undertaking new construction in wetlands unless there is no practicable alternative, and that the proposed action include all practicable measures to minimize harm to wetlands. The proposed project will have no permanent adverse effect on wetlands. Indeed, the area of estuarine conditions will actually expand. Appropriate mitigation would be developed to mitigate impacts to riparian and aquatic habitat.

R **National Historic Preservation Act of 1966 (Public Law 89-665 as amended December 12, 1980).** The area of potential effects (APE) was originally surveyed in 1985 for an earlier project proposal. In the interim, a new project description has been formulated and additional structures in the APE are now 14 years older and need to be reevaluated. A record and literature search and preliminary field investigations of the original APE were conducted by the USACOE in September 1997. In December 1998, the proposed project was expanded to include new alternatives. The City of Santa Barbara (City) supplied the USACOE with a list of additional historic structures within the revised APE. Because of these studies, numerous historic structures were identified in the APE. A consultant has prepared a report to the City which updates the historic property survey with evaluation recommendations. The architectural survey report concluded that several properties are eligible for listing on the National Register of

Historic Places (the report is on file at the City of Santa Barbara). A letter was transmitted to the State Historic Preservation Officer (SHPO) with the supporting documentation. A response was received from SHPO on August 3, 2000, concurring with our determinations of eligibility and effect (Appendix J). The project as planned will have no adverse effect on properties that are eligible for inclusion or, are included in the National Register of Historic Places. The project complies with Section 106.

**Clean Air Act (Public Law 9l-604), as amended.** Section 118 specifies that any Federal activity which may result in discharge of air pollutants must comply with Federal, State, interstate, and local requirements respecting control and abatement of air pollution. Section 176(c) requires that all Federal projects conform to Environmental Protection Agency-approved or promulgated State Implementation Plans. Coordination with the Santa Barbara County Air Pollution Control District (SBCAPCD) has been established and is ongoing. Air quality analysis for the proposed project has been conducted and is included in Section 8 of this EIS/EIR, and air quality data are included in an Appendix G. The USACOE has coordinated with the SBCAPCD for the air quality analysis methodology. The air quality analysis was performed for the worst case scenario. The analysis revealed that the emissions generated by project construction and future maintenance activities would be below State and Federal thresholds. The conformity determination is not required for the proposed project because the emissions generated by the proposed construction are below the Federal standard. A Record of Non Applicability (RONA) is included in Appendix G.

**Executive Order 12898, Environmental Justice.** The alternatives developed for the EIS/EIR were based on a set of criteria that did not discriminate on the basis of race, color, or national origin. This Executive Order requires that the EIS/EIR analyze the impacts of federal actions on minority and low-income populations and provides opportunities for input on the EIS/EIR by affected communities. During EIS/EIR scoping, all interested members of the public, including minority communities and low-income populations, were invited to participate in the environmental process for this action.

**Farmland Protection Policy Act, December 22, 1981 (Public Law 97-98).** This Act requires that Federal agencies identify and take into account the adverse effects of Federal programs on the preservation of farmland; consider alternative actions, as appropriate, that could lessen such adverse effects; and assure that such Federal programs, to the extent practicable, are compatible with State, unit of local government, and private programs and policies to protect farmland. The proposed project area does not support any agricultural land.

**Federal Water Project Recreation Act (Public Law 89-72), July 9, 1965.** This Act requires that any Federal water project must give full consideration to opportunities afforded by the project for outdoor recreation and fish and wildlife enhancement. The proposed project would provide opportunity for recreational activities by development of habitat expansion zones, including recreational use areas, which would be primarily passive in nature.

**Wild and Scenic Rivers Act (Public Law 90-542, as amended through Public Law 96-580, December 23, 1980).** Provides for preservation of certain selected rivers and their immediate environments that possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values in free-flowing condition. The Proposed Action or alternatives affect no wild or scenic rivers.

**Executive Order 13045, "Environmental Health and Safety Risks to Children" (62 Fed. Reg. 1988s (1997).** On April 21, 1997, President Clinton signed this Executive Order. It is designed to focus Federal attention on actions that affect human health and safety conditions that may disproportionately affect children. Executive Order 13045 requires that federal agencies, to the extent permitted by law, and appropriate and consistent with the agency's mission:

*Shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children.*
*Ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.*

Consistent with Executive Order 13045, the project would not disproportionately impact children in the region of influence.

**Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 USC § 4601 (1996)).** In order to acquire private property, the Federal government must follow guidelines set forth under the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 USC § 4601 (1996)). The Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act was created to ensure that (1) owners of real property to be acquired for Federal and federally assisted projects are treated fairly and consistently; (2) persons displaced as a direct result of Federal or federally assisted projects are treated fairly; and (3) agencies implement these regulations in a manner that is efficient and cost effective. The Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act also contains provisions for just compensation, policies for acquisition, and relocation requirements. SBCFC&WCD and the City of Santa Barbara are responsible for property acquisition and relocation activities. SBCFC&WCD and the City will comply with this Act for any alternatives that require the acquisition of private property, the relocation of residents, or both. Also refer to the applicable state relocation laws.

**Coastal Zone Management Act (Public Law 92-583).** The Coastal Zone Management Act (CZMA) preserves, protects, develops, and, where possible, restores or enhances the Nation's coastal zone resources for this and succeeding generations. By letter dated December 15, 2000, the USACOE submitted a Coastal Consistency Determination (CCD) to the California Coastal Commission (CCC), in satisfaction of CZMA requirements (Section 106(d)) to certify consistency to the maximum extent practicable with an approved State Coastal Zone Management Plan. The proposed project is partially within and will have an effect on the coastal zone, as established by the California Coastal Act of 1976. Mr. James Raives of the California Coastal Commission (CCC) has determined that a CCD will be required for the Lower Mission Creek Flood Control Project. The CCD dated December 1999 is included in Appendix D of the Draft EIS/EIR. In addition to Coastal Act policies, the City of Santa Barbara General Plan and Local Coastal Plan Goals and Policies are included in the EIS/EIR and in the analysis of environmental resources.

R Since submittal of the CCD, extensive formal and informal coordination has occurred between USACOE, the City of Santa Barbara and the CCC staff. The CCC requested additional information to evaluate the proposed project for consistency with the habitat, water quality, sand supply, visual, and archaeological policies of the Coastal Act (see Section 1.7 for details on

coordination). In addition, the CCC felt that completion of the Section 7 consultation, including final biological opinions (as required by Endangered Species Act), is essential in preparation of a staff report and recommendation for the proposed project. The USACOE provided additional available information via e-mail and by letter, dated June 21, 2000. The biological opinions were not included in that package. Therefore, the USACOE requested postponement of the public hearing on the CCD until February 2001 or until the biological opinion is received from the USFWS. The USACOE has revised the CCD to incorporate revised project design, mitigation measures and coordination/input received from the CCC staff. The revised CCD can be found in Appendix D of the Final EIS/EIR. The USACOE will make every effort to provide requested information to facilitate the CCC in drafting a staff report/recommendation of the proposed project. Prior to project construction, concurrence from the CCC would be obtained. Therefore, the project would comply with the CZMA.

STATE:

**California Environmental Quality Act (CEQA) (Public Resources Code §§22,000 et seq.).** CEQA requires state and local agencies to disclose and consider the environmental implications of their actions. It further requires that agencies, when feasible, avoid or reduce the significant environmental impacts of their decisions. This document meets the goals, policies, and requirements of CEQA. Information and analysis to meet CEQA requirements are included within this EIS/EIR for each resource.

**California Coastal Act of 1976, as amended.** The Act specifies basic goals for coastal conservation and development related to protection, enhancement and restoration of coastal resources, giving priority to "coastal-dependent" uses and maximizing public access to California residents and visitors. The Act defines the "coastal zone" of California, which generally extends three miles out to sea and inland generally 1,000 yards. It may be extended further inland in certain circumstances. It is also less than 1,000 yards wide in some urban areas. Each city and county in California which is on the coast must prepare a Local Coastal Program (LCP) for all areas within the coastal zone. The LCP includes Land Use Plans, zoning ordinance amendments and map changes to reflect the Coastal Act and LCP goals and policies at the local level. See discussion of required federal coordination of the Coastal Zone Management Act with the California Coastal Act above.

**California Endangered Species Act (Cal. Fish and Game Code §§ 2050-2116).** The California Endangered Species Act (CESA) parallels FESA. As a responsible agency, the California Department of Fish and Game (CDFG) has regulatory authority over state-listed endangered and threatened species. Since the proposed project may affect species that are listed as threatened or endangered under both the state and federal Endangered Species Acts and, since the project is subject to CEQA review and federal review pursuant to NEPA, the CDFG shall participate to the greatest extent practicable in the federal endangered species consultation. The state legislature encourages cooperative and simultaneous findings between state and federal agencies. Further, the General Counsel for the CDFG has issued a memorandum to CDFG regional managers and division chiefs clarifying the CESA consultation process wherein, if a federal Biological Opinion has been prepared for a species, the CDFG must use this Biological Opinion in lieu of its own findings unless it is inconsistent with CESA. CDFG Code Section 2095 authorizes participation in federal consultation and adoption of a federal Biological

Opinion. By adopting the federal Biological Opinion, the CDFG need not issue a taking permit per Section 2081 of the state Code. If the Biological Opinion is consistent with CESA, the CDFG will complete a 2095 form in finalizing the adoption of the Biological Opinion. If the federal Biological Opinion is found to be inconsistent with CESA, the CDFG will issue its own Biological Opinion per Section 2090 of the state Code and may issue a 2081 take permit with conditions of approval. The proposed project would comply with this Act.

**Streambed Alteration Agreement (Cal. Fish and Game Code, § 1600).** Under Chapter 6 of the California Fish and Game Code, CDFG is responsible for protecting and conserving the state's fish and wildlife resources. Sections 1600 et seq. of the Code define the responsibilities of CDFG, and the requirement for public and private applicants to obtain an agreement to:

> *. . .divert, obstruct, or change the natural flow or bed, channel, or bank of any river, stream, or lake designated by CDFG in which there is at any time an existing fish or wildlife resource or from which those resources derive benefit, or will use material from the streambeds designated by the department.*

Federal agencies are exempt from Section 1601, but the SBCFC&WCD is a participant in the project; therefore, SBCFC&WCD will file a Section 1601 application for a streambed alteration agreement. The local CDFG warden or unit biologist typically has responsibility for issuing streambed alteration agreements. These agreements usually include specific requirements related to construction techniques and remedial and compensatory measures to mitigate adverse impacts. CDFG also may require long-term monitoring as part of an agreement to assess the effectiveness of the proposed mitigation. SBCFC&WCD will obtain a Streambed Alteration Agreement prior to the initiation of project construction and, therefore, the project will comply with the Code.

**Surface Mining and Reclamation Act of 1975 (SMARA) (Cal. Pub. Res. Code § 2710).** This Act requires the state geologist to classify, solely on the basis of geologic factors and without regard to existing land use and ownership, the areas identified by the Office of Planning and Research, and other specified areas, as one of the following: (1) areas containing little or no mineral deposits; (2) areas containing significant mineral deposits; and, (3) areas containing mineral deposits, the significance of which requires further evaluation. The California Department of Conservation, Division of Mines and Geology (CDMG) has subsequently divided the above categories into Mineral Resource Zones. The project has complied with this Act and would not significantly impact mineral deposits. The project purpose is flood control, and it is not a mining activity. It is not subject to SMARA.

LOCAL:

### 1.6.1 The City of Santa Barbara General Plan and Local Coastal Plan Goals and Policies:

The City of Santa Barbara follows the guidelines provided in its General Plan and Local Coastal Plan Goals and Policies for evaluation of environmental resources. In addition, the City uses a Master Environmental Assessment prepared for all property in the City to assist in the determination of potential impact. For each resource, the City has established its own policies and goals to preserve the environment. The City of Santa Barbara is a Charter City which means that, instead of following all of the general rules established by the State for cities, the City has

elected to establish its own set of rules to the degree allowed by State law. The Charter was established by a public vote. Amendments to the Charter are also subject to approval by a vote of the citizens of Santa Barbara. Section 4 of this EIS/EIR provides details on applicability of goals and policies for each environmental resource.

## 1.7 AGENCY/ORGANIZATION COORDINATION:

### 1.7.1 Lead and Cooperating Agencies:

The USACOE is the lead agency for NEPA and the City of Santa Barbara is the lead/responsible agency for CEQA (as agreed to by the City and County of Santa Barbara). The EIS/EIR is prepared as a joint document. The proposed project will be cost shared with the local sponsor, Santa Barbara County. Therefore, the document is prepared in compliance with NEPA and CEQA regulations.

### 1.7.2 Coordination for Draft and Final EIS/EIR:

The proposed project was coordinated with the concerned resource agencies during preparation of the Draft and Final EIS/EIR to ensure that the proposed project complies with the requirements of the applicable laws and regulations. The correspondence with the agencies is located in Appendix J of the EIS/EIR. A summary of coordination is provided in the following paragraphs.

**U.S. Fish & Wildlife Service (USFWS):**

Informal discussions with USFWS began late in the fall of 1997. Conversations ranged widely over suitability of habitat along Lower Mission Creek for amphibians, benthic invertebrates, riparian species which form both major structural layers in the riparian plant community, historic occurrences of steelhead in Mission Creek, and the nature of spawning areas and feeding areas used by tidewater gobies. More involved coordination included participation by USFWS at the F4 conference held in April 1999 and the Alternative Formulation Briefing (AFB) in August 1999, including three site visits in the spring of 1999. During one of the field excursions, biologists from USFWS and the USACOE studied examples of eroded stream banks stabilized by riprap and planted in native vegetation. The other two trips involved surveying the entire route of Mission Creek for biological species by walking in it from Canon Perdido Street to Cabrillo Boulevard. Biologists from both agencies, USFWS and NMFS, studied the proposed location and design of structural features to mitigate for impacts to tidewater gobies, water velocity profiles, and the lack of sediment deposition in the estuary. That meeting occurred on site and was intended to refine the placement and design of features which will improve goby habitat in the estuary.

The USACOE has performed a modified Habitat Evaluation Procedure (HEP) to evaluate project related loss of habitat. Calculations in that HEP indicate that specific design features which the Preferred Alternative embodies will yield greater habitat quality compared with future projections if no flood control project were implemented, including the need for annual future maintenance for the life of the project. Conclusions of that HEP have been discussed at length with the USFWS.

R The Draft EIS/EIR was provided to the USFWS for their review during the public review period. A comment letter received from the Department of Interior is located in Appendix K. The USACOE coordinated the modification of the proposed project design, and related changes with the USFWS. On June 7, 2000, the USFWS participated in a meeting with the NMFS via telephone to discuss project design and mitigation features to minimize impacts to the steelhead and tidewater gobies. Subsequent to that meeting, on June 21, 2000, the USACOE provided a revised biological assessment, mitigation monitoring plan, revised project description, hydraulic/engineering analysis, biological assessment for steelhead and project plan. After receipt of the revised biological assessment and supporting information, the USFWS stated that to determine the project related impacts to tidewater gobies, they need additional project specific information.

**National Marine Fisheries Service (NMFS):**

Starting in January 1998, the USACOE began informal discussions with NMFS regarding many aspects of the life history of steelhead in southern California. These discussions have included, but not been limited to, the fidelity of individuals (and hence their genes) to the stream in which they were spawned, the history of stocking coastal streams with fish derived from hatchery stock, the genetic ambiguity of fish as judged by their phenotypic appearance at different stages of their life cycle, the mal-adaption of hatchery trout to survive ocean conditions, and the stimuli which prompt adult steelhead to swim up streams and young steelhead (also known as smolts) to swim down. NMFS regards Mission Creek as a potentially significant migratory corridor for steelhead, despite the general effects of urban development in Santa Barbara. NMFS participated in the F4 conference held in April 1999. A biologist from NMFS participated in one of the field excursions along Mission Creek in May 1999.

Informal discussions with NMFS have dwelt on the physical arrangement of the oxbow bypass culvert and the properties of water flowing through it. This design element of some flood control alternatives should not affect migrating steelhead, either adults or smolts. Water velocities and depths within this structure were a central matter in Section 7 Consultations between NMFS and USACOE.

R A biological assessment was provided to the NMFS with the Draft EIS/EIR in December 1999. The project design was modified after release of the Draft EIS/EIR due to hydraulic/engineering and real estate constraints. The culvert length was increased from the original design. Therefore, the NMFS raised some concerns to determine project related impacts to steelhead. Extensive coordination occurred with their staff to provide satisfactory information. By letter dated March 21, 2000, the NMFS requested of information to analyze project related impacts to steelhead (see Appendix J). They requested detailed project design, cross sections and longitudinal profiles of stream channel throughout the project area, detailed hydraulic analysis, velocity and depths of water within the low flow channel and culvert, scheduling/timing of construction, maintenance procedures, and a detail monitoring plan.

Since the receipt of the request from the NMFS, the USACOE performed numerous hydraulic/engineering analyses to design the weir to maintain the desired water flow through the oxbow to avoid impacts to migration of steelhead through the constructed channel. The USACOE developed additional structural mitigation features to minimize impacts to steelhead and tidewater gobies. On June 7, 2000, the USACOE staff met with NMFS staff at their office.

Mr. Jon Mann (hydrologist) participated in a video conference call and the City staff and USFWS participated via telephone in this meeting. The USACOE provided a brief summary of the modified project design, water velocity within the channel, length, height and location of weir, how a weir would guarantee a minimum flow of 640 cfs through the existing oxbow channel, and implementation of other mitigation features to minimize impacts to steelhead and gobies. Both agencies worked together to achieve a common goal to minimize impacts to steelhead. The USACOE incorporated their recommendations to a maximum extent possible in the project design.

At this meeting, the NMFS stated that minimal daily flow, sediment budget, existing water surface profiles, longitudinal profiles of the creek bed and representative cross-sections of the stream need to be considered in project design. Agreement was reached that a 2.3 year level of flow, equal to about 640 cfs, should pass through the low flow channel. Mitigation features to ensure this flow level and other structural features to be implemented to minimize impacts to steelhead were discussed. The NMFS agreed with the proposed mitigation structural features to minimize impacts to steelhead (see details in biological assessment of steelhead). The USACOE agreed to provide all required detailed hydraulic/engineering analysis, design plan, revised biological assessment, and revised project description by the middle of July 2000. On July 16, 2000, the USACOE provided a revised biological assessment with the supporting information, including revised project description, hydraulic/engineering analysis, mitigation monitoring plan, shade study, revised biological assessment for steelhead, and project plan. The NMFS provided a Final Biological Opinion on August 2, 2000 (see Appendix B).

**U.S. Army Corps of Engineers Regulatory Branch:**

The Environmental Resources Branch (ERB) initiated coordination with the USACOE Regulatory Branch in March 1999. The Regulatory staff participated in the F-4 conference meeting. A copy of the F-4 package was provided to Regulatory Branch (Ventura Field Office) for their review. Regulatory staff participated in both meetings, the F4 conference and the AFB.

R The Regulatory branch received an application from the local sponsor to obtain a Section 404 USACOE Regulatory permit (December 20, 1999, Appendix E-1). Regulatory Branch requested a detailed mitigation monitoring plan identifying goals, success criteria and monitoring of the planted vegetation and other biological resources. The Environmental Resources Branch (ERB) prepared a detailed mitigation monitoring plan and on June 22, 2000, revised information including: revised project description, mitigation monitoring plan, revised biological assessments and hydraulic/engineering analysis and project plans and drawings were provided for their information. The ERB staff will coordinate with the Regulatory Branch of waiver of the Section 404 Water Quality permit under Section 404 (r) regulation.

**California Regional Water Quality Control Board (CRWQCB):**

On August 17, 1999, the USACOE called CRWQCB staff to inform them the proposed Lower Mission Creek Flood Control Project. Mr. Higgins stated that their concerns would be the restoration of riparian vegetation in the stream, which provides benefits to water quality and improves the environment for steelhead. The CRWQCB would tend to defer to USFWS and NMFS on these issues. The CRWQCB's major goal is improvement of the environmental conditions along Lower Mission Creek. The USACOE invited the CRWQCB to participate in

the AFB meeting. Mr. Higgins could not attend the meeting.

On November 9, 1999, the USACOE staff informed CRWQCB that the proposed project construction would be exempted under Section 404(r) regulations. The guideline of 404 (r) has been provided to the CRWQCB staff via e-mail for their information.

R On December 20, 1999, the USACOE and the Santa Barbara County Flood Control District submitted a request for a waiver from the Section 401 Water Quality Certification (Appendix E-1) for the proposed project. Future maintenance is a part of the project. Impacts related to future maintenance for the life of the project are included in the EIS/EIR. By letter dated February 2, 2000, the CRWQCB provided a waiver from the Section 401 Water Quality Certification for the project construction and the future maintenance (Appendix E-1). On June 21, 2000, the USACOE provided a revised project description, hydraulics/engineering analysis, biological assessments, and mitigation monitoring plan to CRWQCB for their information. The revised project description did not change impacts to waters of the United States. Therefore, waiver of the Section 401 Water Quality Certification remains in effect.

**California Department of Fish and Game (CDFG)**:

Many informal discussions with CDFG regarding steelhead in Lower Mission Creek have occurred since December 1997. These exchanges centered on details of physiology, historic distribution, fidelity to natal streams, frequency of recognizable genetic stocks of steelhead in southern California streams, and the appearance above the project area of trout with every feature of steelhead after the El Niño rains of 1998. Streambed conditions which favor migration up and down coastal streams have been a significant element of discussions and considerations, as well. Following discovery of a pair of steelhead spawning within the project area and numerous malts at Oak Park and other lower sections of the creek in the spring of 2000, further discussions about stream heterogeneity took place. These focus on the benefits of a pilot channel, fish ledges, and side baffles as ways to improve conditions during steelhead migration.

**California Coastal Commission**:

On November 18, 1999, the USACOE initiated coordination with the California Coastal Commission (CCC) staff (Mr. Jim Raives) of the proposed project. Mr. Jim Raives stated that the proposed project would require a Coastal Consistency Determination (CCD). Informally, the CCD was provided to the CCC for their review and recommendations during preparation of the Draft EIS/EIR.

R On December 20, 1999, the USACOE submitted a CCD with project description, HEP analysis report, biological assessments, and Draft Coordination Act Report to CCC. Since submittal of the CCD, extensive coordination has occurred between USACOE, City of Santa Barbara and CCC staff. The CCC staff expressed their concerns for the project design, and required detailed project plans to examine the project features. In addition, they were concerned about construction of vertical walls within the coastal zone, impacts to water quality, non-point source discharge degrading water quality of the creek, goals, success criteria for the planted vegetation, impacts to endangered species, estuarine habitat, mitigation, sand supply, HEP analysis, visual resources and cultural resources. The CCC also desired to have biological opinions from both agencies, USFWS and NMFS, to make their determination. The CCC

recommended that the USACOE examine an alternative with vegetated riprap slope or a full vegetated riprap bank below the freeway. The USACOE performed a cursory economic analysis of these alternatives. Results of this conceptual analysis can be found in the Economic Appendix. These alternatives are not economically feasible.

A staff report for the proposed project was prepared in January 2000, and a Draft copy was provided to the USACOE for review. Since then the staff report was revised in July 2000. The USACOE provided response or input formally or informally since January 2000. On June 21, 2000, the USACOE provided revised project description, mitigation monitoring plan, revised biological assessments (steelhead and goby), hydraulics/engineering analysis, and supporting project plans and drawing. The CCC staff again felt that there was not enough information to make their determination and recommendation for the proposed project implementation. The USACOE requested postponement of the public hearing on the proposed project until the biological opinion is received from the USFWS. The CCC staff provided recommendations to incorporate in the project design to minimize impacts to environmental resources. The USACOE will revise the CCD and submit it again to the CCC for their consideration with the biological opinion.

The City of Santa Barbara provided a letter (February 22, 2000, Appendix J) to respond to some of concerns on construction of vertical walls between Yanonali and State Streets, and aesthetics of the coastal zone. The City identified the possibility of using Redevelopment Agency Funds to improve esthetic resources of the coastal zone within the project area.

R **State Historic Preservation Officer (SHPO):** Consultation with the SHPO toward Section 106 compliance was completed with receipt of their letter dated August 3, 2000. They concurred with our determinations of eligibility and non-eligibility for the various buildings and structures in the APE. Some structures and both neighborhoods were determined not to be eligible for inclusion on the National Register of Historic Places. They also concurred with our determination that the project as planned will have no adverse effect on properties that are eligible for inclusion or, are included in the National Register of Historic Places. The project complies with Section 106.

**Santa Barbara County Air Pollution Control District:**

Ms. Vijaya Jammalamadaka, Air Quality Specialist, was consulted on November 16, 1999, regarding the proposed project. Ms. Jammalamadaka provided USACOE with the latest Air Quality Sections of their Environmental Document via e-mail. As stated within the document and reiterated by Ms. Jammalamadaka, quantitative thresholds of significance are not currently in place for short-term construction emissions. She requested that a worst case calculation be performed and to use 25 tons per year as a threshold value for each pollutant to compare project related emission.

R **Environmental Defense Center:**

On July 31, 2000, the USACOE and the City of Santa Barbara met with Mr. Brian Trautwein of the Environmental Defense Center (EDC), Mr. Eddie Harris of the Urban Creeks Council and Ms. Kendy Radasky of the Santa Barbara Audubon Society to discuss their concerns and modifications of the mitigation measures. The concerns discussed at this meeting included, were

not limited to, use of vertical walls, loss of streambed habitat, creating a pilot channel (bankfull channel), cleanup of contaminated sites along the creek bank, removal avoidance of vegetation in bankfull channel, planting riparian vegetation should be closer than identified in the EIS/EIR, use of black cottonwood instead of Fremont cottonwood, and fish passage improvements in the Caltrans channel. The USACOE and the City provided a brief summary of the revised mitigation measures, how impacts would be minimized to the listed species and aquatic habitat. Revised Biological Assessments, Mitigation Monitoring Plan, Revised Project Description and Hydraulic/Engineering Analysis were provided to EDC staff for their information.

# SECTION - 2 - NEED FOR AND OBJECTIVES OF ACTION

## 2.1 STUDY AUTHORITY:

The Lower Mission Creek Flood Control Project is authorized under Section 209 of the Flood Control Act of 1962 (Public Law 87-874, 87th Congress, 2nd session), which reads in parts as follows:

*"Sec. 209. The secretary of the Army is hereby authorized and directed to cause surveys for flood control and allied purposes,... to be made under the direction of the Chief of Engineers, in drainage areas of the United States and its territorial possessions, which include the following named localities [including]:*

*All Streams in Santa Barbara County, California, draining the Santa Ynez Mountains, except Santa Ynez River and tributaries."*

## 2.2 NEED FOR THE PROJECT:

Mission Creek, especially downstream from Carrillo Street, poses a serious flood threat to the City. In this area, a mix of residential, commercial, and public properties is subject to major damages during floods. Therefore, in partial response to Section 209 of the Flood Control Act of 1962 (Public Law 87-874, 87th Congress, 2nd session), the USACOE and the City of Santa Barbara are preparing the following report to address flood control and associated problems for lower Mission Creek. In addition, alternative solutions and recommendations to solve the flood and associated problems are included with consideration of economic, environmental and social needs of the area.

As the recent flooding shows, the same storms today result in more floodwaters because of urbanization of the lower watershed and flood plain, and light to moderate development of the middle watershed. More pavement, roofs, concrete and drains in both the middle and lower drainage areas have greatly increased the potential for substantial runoff since the early 1900's. Despite current setback requirements, more residual encroachment remains than during the early 1900's. Many bridges and channels still have very limited capacities; several can pass only storm flows with occurrence frequencies of less than two to ten years.

The rainfalls that cause flooding in the Santa Barbara area are intense, local storms typical of the south coastal area. These floods are of a short duration, with extreme flooding

lasting a few hours or less. Past floods in the cities and communities of Santa Barbara, Goleta, Montecito and Carpinteria have demonstrated that localized storms can cause substantial damages in one area while completely bypassing another.

During each flood, material deposits in the creek bed. Debris comprises mostly boulders, cobbles, stones, sediment, brush and trees washed from the upper watershed area and from the narrow canyon section above State Street. Upon reaching the flatter slopes downstream from State Street, the debris deposits in the channel, obstructs flow and causes sediment-laden waters to flood the adjoining properties.

**Past Flooding History**: Historical records of floods along Mission Creek date back to 1862. Most historical data is qualitative; very little quantitative data is available. Records since 1900 show that floods occurred in the south coast of Santa Barbara County in 1906, 1907, 1909, 1911, 1914, 1918, 1938, 1941, 1943, 1952, 1955, 1958, 1962, 1964, 1967, 1969, 1973, 1978, 1980, 1983, 1995 and 1998. Increasing urbanization of the watershed during the historical period has undoubtedly contributed to increased run-off. Continuous records of peak discharges are only available for the last 24 years. A stream gaging station was established on Mission Creek in October 1971. A stream gage was established in 1941 on San Jose Creek, draining a similarly sized watershed ten miles to the west of Mission Creek. Flood damage surveys have been conducted since 1969, but even these surveys were not complete for several of the floods. Prior to 1969, the records are mostly from newspaper accounts, field investigations and eyewitness accounts (see details on past history in main report).

**The Following Paragraphs Briefly Describe the Flooding History from 1952 to Recent:**

**January 1952**: During 1952, due to heavy rain, the project area was flooded several times. About 50 homes were flooded during this period. Nearly all the bridges were blocked during the peak of the storm as water was two to three feet over many of the bridges. The bridges were saved by crews removing debris. Floodwaters entered homes in the Haley and De la Vina Street area. A house and two garages near Gutierrez Street were washed away. Many bridges were barricaded because of threatening floodwaters including the De la Vina Street bridge near Alamar Avenue.

**November 1964**: During this storm, the Montecito area was flooded. During the flood, boulders moved down the stream beds and, together with residue and debris, plugged bridges and obliterated stream channels, causing mud flows over several residential areas. The emergency work prevented substantial additional damages. Very minor damages were reported along Mission Creek; clearing of the channel and some bank protection work was needed.

**January 1967:** The 1967 flood caused moderate to major damages along the lower reaches of Mission Creek, from the Haley Street bridge, about a quarter mile upstream of U.S. Highway 101, to the Pacific Ocean. The major flood damages occurred along a reach just downstream from Haley Street where many residential and commercial establishments were damaged by debris-laden waters. Considerable debris was deposited on the streets and along the Southern Pacific railroad.

**January 1969**: The January 1969 flood caused only limited damages along Mission Creek. Heavy debris flows blocked bridges and obliterated streams in the foothill areas. About 100 homes in the Montecito area and 250 homes and 21 commercial establishments in the Carpinteria area were damaged.

**February-March 1978**: During this year, the U.S. Highway 101 crossing flooded and around 50 structures were damaged; damages were limited by the fact that most of the houses are elevated a few feet above grade.

**February 1980**: The February 1980 flood along Mission Creek required channel repair at a cost of $241,500 (1995 dollars). Houses between Cota Street and Cottage Avenue on De la Vina Street were flooded. Among the bridges overtopped were the Haley and Chapala Street bridges.

**1983:** The 1983 floods along lower Mission Creek caused erosion to the banks from Ortega to Haley Streets. Emergency rip-rap was placed along the channel to protect several threatened houses. The Mason Street bridge blocked and diverted flood waters away from the creek along Mason Street.

**January 1995**: During this flood, a narrow strip of the residential area along the creek above Highway 101, as well as most of the floodplain between Highway 101 and the Pacific Ocean were flooded. January 10th eight hour duration rainfall totals for the gauges near the Mission Creek drainage area show a range of values from a low of 5.59 inches to a high of 7.42 inches.

**1998**: In 1998, during the storm season, Mission Creek overflowed its banks near the railroad tracks, resulting in localized flooding at the railroad station and along Lower State Street. No major damage occurred during this flooding event. See details in Main Report Section III.

## 2.3 PLANNING OBJECTIVES:

The objective of this study is to analyze the flooding and associated problems along Lower Mission Creek, to consider alternative solutions to flooding and associated problems, and

to recommend, for implementation, a solution to these problems. In development of alternatives, consideration has been given to the economic, environmental, and social needs of the study area. The Federal objective of water and related land resources planning is to contribute to national economic development consistent with protecting the nation's environment, pursuant to national environmental statutes, applicable executive orders and other Federal planning requirements.

**Economic Criteria:** The general economic criteria applied in formulating and comparing alternatives are summarized below:

- Tangible project benefits must exceed economic costs. The benefit-to-cost (B/C) ratio is a measure of this criterion. The B/C ratio must exceed 1:1 to achieve economic justification. Benefits generally include reduced damage to public and private property and reduced flood insurance costs for properties no longer in the flood plain.

**Environmental and other Criteria**: Principles and guidelines further provide that environmental quality, social well-being, and regional development should be taken into account, as well as national economic values. The plan that makes the greatest possible contribution to the natural environment is called the environmental quality (EQ) plan. The following environmental criteria were considered in development of the alternatives.

- Potential impacts associated with the proposed action will be fully evaluated. Resource categories that will be analyzed are: land use, physical environment, geology, biology, agriculture, air quality, water quality, groundwater, recreational usage, aesthetics, cultural resources, transportation/communications, hazardous waste, socioeconomics and safety.

- Each alternative shall be evaluated as to its potential impact, either beneficial or adverse. Significant resources located within the project area need to be identified. The relationship between short-term uses and long-term productivity of impacted resources needs to be determined. Irreversible and irretrievable commitments of resources shall be identified.

- Analyze project related impacts to each resource. If the impacts to the resources are adverse or impacts could be unavoidable, provide feasible mitigation measures to minimize project related impacts.

- Consideration shall be given to public health, safety, and social well being, including the loss of life.

## 2.4 PUBLIC PARTICIPATION:

Public participation is especially important to environmental analysis by providing assistance in defining the scope of analysis in the EIS/EIR; identifying significant environmental issues and impact analysis in the EIS/EIR. Participation of affected Federal, State, and local resource agencies, Native American groups and concerned interest groups/individuals is encouraged in the scoping process. Public participation is initiated by providing a Notice of Intent and Notice of Preparation of the EIS/EIR. Details are provided in the following paragraphs.

### 2.4.1 Notice of Intent/Notice of Preparation:

This environmental document is prepared in compliance with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). This is a joint Environmental Impact Statement and Environmental Impact Report (EIS/EIR). The USACOE is a Federal agency; therefore, the document is prepared in compliance with NEPA. A Notice of Intent (NOI) was prepared to announce preparation of an Environmental Impact Statement (EIS). The NOI was published in the Federal Register on October 13, 1998 (Appendix I). Santa Barbara County and the City of Santa Barbara are the co-lead agencies for CEQA. Therefore, a Notice of Preparation (NOP) was prepared by the City of Santa Barbara. The NOP was published in the Santa Barbara News-Press on October 13, 1998. An Initial Study was also prepared for the project to determine the potential environmental effects to be studied in the EIS/EIR. The information contained in the Initial Study is consistent with the Corps' and Santa Barbara County Flood Control District's decision to prepare a comprehensive EIS/EIR. The Initial Study was distributed to the agencies, environmental groups and interested public. Copies of the NOI, NOP, and Initial Study are included in Appendix I.

The NOI and NOP provide formal notification to all federal, state, and local agencies involved with funding or approval of the project, and to other interested organizations and members of the public, that an EIS/EIR will be prepared for the project. The NOI and NOP are intended to encourage interagency communication concerning the proposed project and provide sufficient background information about the proposed project so that agencies, organizations, and individuals can respond with specific comments and questions on the scope and content of the EIS/EIR.

### 2.4.2 Summary of Public Workshop and Scoping Meeting:

Public Workshop: Prior to the public scoping meeting, a public workshop was conducted on August 28, 1997, by the U.S. Army Corps of Engineers (USACOE), the Santa Barbara County

Flood Control District (SBCF&WCD) and the City of Santa Barbara to provide an update on the progress of the Lower Mission Creek Feasibility study to the public of the Santa Barbara area. The purpose of the workshop was to provide an opportunity to the residents to discuss their concerns about flooding, the environment, potential solutions, and issues related to project costs and funding. The Workshop notice was provided in the Santa Barbara News Press on Sunday, August 17, 1997. A Summary of the public concerns expressed at that meeting are identified below:

**Public Concerns Expressed at August 28. 1997, Workshop:**

- Plan to coordinate with Waterfront project which is on going
- Coordinate with the concerned environmental groups.
- Provide maximum flood protection, about 5,800 cfs, minimum 35 years of flood protection.
- Clean up the lagoon; include as a part of the study. Improve water quality at lagoon.
- Storm drains were blocked and the street got flooded, Evaluation of storm water permit, what will be project impact.
- Chapala Bridge should not be replaced; railroad crossing is closed so there is no use replacing bridge.
- Soft bottom channel.
- No vertical walls.
- Protect the resources.
- Steelhead trout is listed and runs through the creek.

Public concerns received during the Public Workshop were taken into consideration in the development of the alternatives. These concerns were similar in nature to the concerns received during the public scoping meeting. Responses to these concerns are found in the subsequent section on the public scoping meeting.

2.4.3 **Public Scoping Meeting on Initiation of EIS/EIR**: On October 29, 1998, the Los Angeles District, U.S. Army Corps of Engineers, and the City of Santa Barbara Planning Commission hosted a public scoping meeting at the City Council Chambers, Santa Barbara, to obtain agency and community views and concerns. The concerns expressed at the meeting included the need to consider a variety of alternatives; the need to address biological resources including such sensitive species as steelhead and the tidewater goby; the need to consider potential impacts to air quality, water quality, aesthetics, safety, and cultural resources; and the need to comply with both the National Environmental Policy Act and the California Environmental Quality Act. All of these concerns have been addressed during project planning and preparation of the EIS/EIR. List of comment letters received from the public during the scoping process are located in Appendix I-1 of the EIS/EIR (letters are on file at USACOE,

Los Angeles District and City of santa Barbara). Concerns identified by the public on August 28, 1997, were similar to the concerns raised at the public scoping meeting for the EIS/EIR.

**Summary of the public concerns received for the proposed project are presented below:**

**Concerns-Project Design:**

- Project design should incorporate flood control, restoration of wetland and riparian habitat, improvement of water quality, visual/aesthetic resources and socioeconomics.
- Carrying capacity of the bridges should be evaluated.
- Many people expressed support for the plan as adopted by the Consensus Group (1994) and encourage the Corps to consider ways of implementing it.
- Some people suggested building on the 1994 consensus; that is, using it as a starting point for the project design.
- No use of concrete
- Divert excess flows to Arroyo Burro Creek
- Increase stream capacity from upper De la Vina to ocean.
- Prefer environmentally friendly plan.
- Wider channel will reduce area available for riparian buffer zone and recreation activities, and would impact water quality. Wider channel will be more expensive.

**Response- Project Design:** During plan formulation, the USACOE and SBCF&WCD and the City of Santa Barbara had several meetings to develop alternatives. The public concerns and plans identified by the Consensus Group were incorporated to the maximum extent in plan formulation. Use of concrete has been minimized, the creek bottom would be natural, with upper sideslopes stabilized with riprap plated with native, riparian vegetation. The tentative Recommended alternative is the environmentally superior plan compared to all other alternatives. In the future, this alternative will provide maximum biological values and quality and quantity of habitat compared to other feasible alternatives. This alternative provides incidental environmental benefits by planting native and riparian type habitat along the riprap banks, habitat expansion zones and construction of wetlands. For details, please refer Section 3.0 of the EIS/EIR and the Plan Formulation Section in the Main Report.

The USACOE performed hydraulic modeling of 5,800 cfs conveyance capacity. In order to obtain the required capacity, a greater invert width would be required. In addition, the bypass would be expanded to a triple 8 foot by 16 foot box culvert. It was determined that 5,800 cfs

conveyance was not feasible due to bridge constraints at Bath Street, State Street, and Cabrillo Boulevard Bridges. Replacement of these bridges was considered; however, due to their location, replacement of the bridges was not economically feasible. In addition, more real estate would need to be purchased in order to construct this alternative. The added costs of replacing these bridges and acquiring additional real estate would likely yield a benefit cost ratio less than 1:1; therefore, this alternative has been eliminated from further consideration.

**Concerns - A Concrete vs. a Natural Channel Downstream of Highway 101:**

- Sideslope stabilization with vegetated banks below U.S. 101.
- Strong opposition to construction of concrete/vertical walls; if vertical walls are necessary, incorporate aesthetic treatment, rough surface, sandstone with planting vegetation, creation of planting pockets.
- Public safety, in regard to the ability of people to get out of the creek if they fall in; and alternative methods of bank stabilization.
- Consider alternative methods of bank stabilization.

**Response - A Concrete vs. a Natural Channel Downstream of Highway 101:** See response above. Below Highway 101, there is limited opportunity to apply the combination of vegetated riprap and short wall protection due to close proximity of residential and commercial structures. In addition, such a design would result in the loss of several important historic structures. Due to the real estate and economic constraints, use of vegetated slopes within this project reach is not feasible except in two areas on the easterly bank up and downstream of Mason Street. See details in Main Report, Section IV, Plan Formulation and Section V of the Selected Plan.

**Concerns - The Buried Culvert at the "Oxbow."** Issues include its effect on:

- Construction of culvert from Gutierrez Street to Yanonali Street would have adverse/significant impacts on the landmark Morton Bay Fig Tree.
- Cleaning out culvert would be difficult and costly.
- Clogged culvert would cause flooding; who would be responsible for cleaning?
- Safety issue: criminals and homeless would live and hide in culvert.
- Impact on habitat, including steelhead migration.
- Historic sandstone retaining walls could be destroyed.
- Railroad operations will be disrupted during construction.

**Response - The Buried Culvert at the "Oxbow":** The box culvert would be constructed downslope from the tree and outside its dripline. Neither the trench needed to install it, nor the finished buried culvert itself would disrupt subsurface movement of water toward the tree's root system.. The reinforced box could actually function as a buried sill and cause a small accumulation of soil moisture on the side toward the tree. In consequence, the fig may have a readier source of water toward the southwest during dry times. No impact of any kind would occur to the Moreton Bay fig as a result of implementation of the project design. See details in Section 10.3 of the Biological Resources.

Fencing would be provided along the creek banks to prevent access by the public within the creek; therefore, the public would not have direct access to the culvert. Maintenance access by suitable equipment to clean culverts has been taken into consideration during design development. A railroad services detour would be provided during project construction; therefore, no disruption in services is anticipated. However, any unavoidable disruption would be very short-term and temporary. Sandstone walls along the railroad track will not be removed, but sandstone walls for the remaining reach below Chapala bridge may be removed to accommodate new bank protection.

**Concerns - Erosion Problem:**

- A few citizens voiced their concerns regarding bank erosion and losing properties, particularly at 123 W. Gutirrez Street.
- Consider other options for bank erosion control, such as those outlined in International Erosion Control Journal.

**Response-Erosion Problem:** The new bank protection is anticipated to prevent future erosion.

**Concerns - Biological Resources:**

- Evaluate project related impact to Steelhead.
- Project should not result in loss of wildlife habitat.
- Provide natural vegetated slope.
- Evaluate impacts to significant habitat, including vegetation supporting threatened, endangered, and other species.
- Provide buffer zone for riparian vegetation.

- Provide mitigation by habitat restoration; consider removal of debris for Steelhead migration; create pools and riffles.
- Consider removal of existing debris basins to reduce barriers to steelhead mitigation.
- Remove existing concrete channel bottoms to encourage fish passage and riparian eco-functions.

**Response Biological Resources:** Project related impacts to the biological resources, including the listed species such as Steelhead and Tidewater Goby, have been examined and analyzed in detail in Section 10.3 of the Biological Resources Section. Implementation of the proposed plan provides maximum environmental benefit compared to any other alternatives. The Habitat Evaluation Procedure has been performed to evaluate project related impacts to the biological resources. This analysis also identifies quality and quantity of the habitat to be impacted due to the construction of the project (see details in Appendix C of the EIS/EIR. Appropriate mitigation measures or environmental commitments are developed to avoid impacts to two endangered species of fish (steelhead and tidewater goby), including improvement of channel bottom by removing concrete, installation of energy dissipaters made from fields of protruding rocks, and abatement of giant reed (see details in Section 10.3 of the EIS/EIR). The project design incorporates maximum vegetation along riprap, habitat expansion zones and creation of wetland. The tentatively recommended plan provides maximum environmental benefit (see Section 3.5 of the EIS/EIR).

**Concerns - Establishment and Protection of Wetlands:**

- Issues include the effects of wetlands as bio-filters and habitat. Several people said this project should be considered a "riparian restoration project" rather than a flood control project.
- Dispersed wetlands work as well as large ones. Consider creating them in the channel, the floodplain, Laguna Channel, Sycamore Creek or the bird refuge. In addition, consider recreating a wetlands link between Mission Creek and Laguna Channel.

**Response - Establishment and Protection of Wetlands:** We looked at opportunities to create wetlands within the project reach (see details in Section 3.5 and 10.0 of the EIS/EIR). Restoration outside the project reach, or creation of wetlands outside of the project area, is beyond the scope of the study. Additional environmental restoration opportunities could be pursued under other Corps programs if requested and financial support is received from the non-federal sponsor. In addition, the City of Santa Barbara Redevelopment Agency has budgeted funds for a study of Waterfront Area wetlands restoration opportunities.

**Concerns - Water Quality:**

- Improve water quality, including creation of open, natural channels and eliminating concrete.
- Water quality, both in the creek and on ocean waters, is affected by natural bio-filters and temperature.
- Analyze pollution and contamination entering in the creek water.

**Response - Water Quality:** The proposed project design is to implement natural bottom channel and stabilization of the creek banks with a combination of short walls at the lower banks and vegetated riprap along the upper banks. In addition, about 15,000 sq. ft. of concrete bottom will be removed as part of this project. Upper banks are gentle and planting will allow filtration. Existing urban refuse would be removed. With implementation of sound environmental design, the existing water quality would be improved. Measuring pollution and contamination within the project reach has been initiated since 1995, and is still going on. The City of Santa Barbara is preparing plans to improve the water quality along Lower Mission Creek and reduce discharge of the pollutants or contamination in the creek (see details in Section 7 the EIS/EIR, Water Resources).

**Concerns - Aesthetics:**

- Provide as much green vegetation as possible; use native vegetation, sycamores etc.
- Bridge construction- use formally designed bridges and natural borders and sycamores.
- Existing sandstone walls would be destroyed due to implementation of the project.
- Consider aesthetics, as they affect people living along the creek, other local residents using areas near the creek, and tourists visiting the waterfront area.
- Many people recommend the removal of concrete already in place in areas of the creek.
- Concrete, textured to look like sandstone, should be used where vertical walls are unavoidable.
- Aesthetics in the area below U.S. 101, which serves as an entry to the City, are extremely important.
- Fences along the Creek are unsightly.
- Consider buying additional land along the creek for parks and pedestrian paths.

**Response - Aesthetics:** Improvement of the aesthetic resources has been considered in the development of the project design. Most of the upper slopes would be established by riprap and planted by native and riparian type of vegetation. Appropriate aesthetic treatment would be applied for the lower short-vertical-walls. The creek would have a natural bottom rather than concrete bottom and existing concrete bottom areas would be removed. Wherever the land is available, about five to six habitat expansion zones would be created, which would allow intrusion of the riparian type of vegetation beyond the creek banks. Compared to the existing conditions, the aesthetic values would be improved.

**Concerns - Public Safety:**

- Consider the possibility of homeless people living in the culvert.
- Vertical walls cause a safety concern because of people falling in and not being able to get out from the creek bed.

**Response - Public Safety:** The project design includes fencing at the top of the banks that will prevent access to the creek and culvert. Most of the creek banks would be stabilized with a combination of gentle vegetated riprap and short vertical walls, making it possible for people who fall in to get out.

**Concerns - Socioeconomics:**

- The issue is the loss of moderate-income housing stock as a result of creek widening.

**Response - Socioeconomics:** The USACOE will appraise the property prior to removal of the structures. The property owner will be compensated with that value. Existing tenants will be relocated. As redesigned, fewer units will be demolished than indicated in the Draft EIS/EIR. The number of structures lost has dropped from 14 to 10.

**Concerns - Cultural Resources:**

- Issues include protection of historic and Native American resources.
- Resurvey the project area, particularly north of the freeway, for cultural resources.
- Section 106 requires full environmental disclosure of impacts to historic resources. Mitigation must apply to both the interior and exterior.

- Consider the loss of historic structures immediately adjacent to the Creek.

**Response - Cultural Resources:** The City of Santa Barbara has awarded a contract to conduct an updated survey of the affected built environment in the Area of Potential Effects (APE). The survey report recommended structures which should be determined eligible for National Register, California Register and/or local listing. Mitigation of adversely affected historic properties may consist of historic retrieving data of the eligible historic properties, possible relocation of important houses, adaptive reuse of the Mission Creek Diversion and reconstruction or avoidance of the Chapala Street Bridge. Distinctive architectural features or elements from historic properties that are scheduled for removal will be reused where possible. A stipulation in the Memorandum of Agreement, if needed, will dictate the level of mitigation of Native American materials if any are discovered during ground disturbing activities. Archaeological and Native American monitors will be on-site during all ground disturbing activities to ensure that if any Native American materials or deposits are discovered, the Corps of Engineers and the City of Santa Barbara will be notified immediately.

**Concerns - Cost-Benefit Analysis:**

- Issues include what items are included in the analysis and how a cost-benefit ratio is calculated. Include beach closure, water pollution, maintenance, the need for buffer zones along the creek, prevention of sedimentation and pollution and natural and recreation values.

**Response- Cost-Benefit Analysis:** Those issues have been taken into consideration during the plan formulation process. However, the formal cost benefit analysis required for USACOE projects does not allow for consideration of values that do not have a direct economic benefit.

**Concerns - Maintenance:**

- Provide a detailed maintenance plan in the EIS/EIR.

**Response - Maintenance:** Detailed future maintenance activity description has been developed and included in Section 3.5 of the EIS/EIR. It has been further expanded upon in a new draft Maintenance Plan prepared by the County, with assistance by Ann Riley, a respected creek restoration expert.

**Concerns - Growth Inducement:**

- Recognize the potential for future development on creek.

**Response - Growth Inducement:** Future development in the project area is expected to consist of intensifying existing development on those residentially zoned properties that have remaining development potential. Privately owned vacant parcels will also be expected to have development on their sites in the long term. Redevelopment of commercial properties will be expected to occur in the Waterfront Area as the economy allows. Development of additional square footage for non-residential properties is limited by the City Charter, General Plan and Zoning Ordinance to 3,000 square feet per parcel, in most circumstances. Very few, if any, changes are expected in the amount and timing of development expected to occur on the creek.

**Concerns - Historical Natural Drainage Patterns and Modifications within the Watershed:**
The Environmental Protection Agency (EPA) expressed their concern regarding complete analysis and documentation of the historical natural drainage patterns and modifications within the watershed, including rainfall quantities, groundwater discharges, dams, reservoirs, and imported water discharge. Letter dated October 23, 1998 is located in Appendix J.

**Response** - Historical Natural Drainage Patterns and Modifications within the Watershed: The USACOE has conducted a "Debris Deposition Study for without-project and with project conditions, Santa Barbara County Streams, Mission Creek/Rattle Snake Creek, Santa Barbara County", September 1984. The study consisted of a qualitative evaluation of the watersheds, including collection and evaluation of available historical data to determine the hydrological and debris flow characteristics of the watersheds. A qualitative analysis was then performed to estimate the quantities of debris produced during various return period events. The effect of fires on debris production quantities was considered in the analysis. Debris flow and sediment yield quantities were estimated at each of the two existing debris basins on Mission and Rattlesnake Creeks. The report also included flood and sediment erosion history, sediment yield analysis, sediment size and distribution, annual sediment yield, degradation/aggradation and type and amount of sediment. The USACOE conducts detailed hydrological and hydraulic studies for evaluation of flood control alternatives.

Additional study of the watershed would be out of the scope of this study. Watershed study could be performed under different USACOE authority, if the local sponsor is available to participate in the financial cost and project design.

**Concerns - City of Santa Barbara General Plan and Local Coastal Plan (L.P.) Goals and Policies Consistency:**

- The flood control plan must be consistent with all city general plan and local coastal plan goals and policies, State and Federal laws and California Coastal Act.
- Evaluation of each resource is needed in relation to the City of Santa Barbara's General and Local Coastal Plan and Policies.
- Evaluate the project against the Downtown/Waterfront Vision.

**Response - City of Santa Barbara General Plan and Local Coastal Plan (L.P.) Goals and Policies Consistency:** Section 4 of the EIS/EIR provides details on the City of Santa Barbara's General Plan and Policies for environmental resources. The General and Local Coastal Plan and Policies have been incorporated in the evaluation of each environmental resource. Sections 6 through 19 of the EIS/EIR provide evaluation of each environmental resource for the proposed project.

R 2.5 **PUBLIC REVIEW OF DRAFT EIS/EIR:**

The Draft EIS/EIR was provided for public review in December 1999. The Corps of Engineers filed copies of the EIS/EIR with the EPA on December 15, 1999. The Notice of the Availability (NOA) of the Draft EIS/EIR was published in the Federal Register on December 23, 1999. Copies of the Draft EIS/EIR were provided to California State Clearing House (SCH# 1998101061) for agency distribution in compliance with CEQA. The City of Santa Barbara published the NOA of the Draft EIS/EIR and public hearing in the local Newspaper. The Draft EIS/EIR was distributed to agencies and the public for 45-days public review (December 23, 1999 to February 7, 2000). Copies of the Draft EIS/EIR were made available at the public library for the public who wished to review the Draft EIS/EIR. The public hearing was conducted on January 19, 2000, at City Hall, City Council Chambers, Santa Barbara at 6:30 pm. to solicit the public's concerns on the Draft EIS/EIR. The public was informed by mailing Notices and publishing a notice in the local newspaper (Appendix I-1). A summary of the public comments received during the public hearing are included in the Appendix I-2 of the EIS/EIR. Comment letters received on the Draft EIS/EIR and responses are located in the Appendix K. In accordance with NEPA (Section 1503.4(b) and CEQA (Section 15088), the USACOE, Santa Barbara County and the City of Santa Barbara reviewed the comment letters; appropriate responses are provided in Appendix K of the EIS/EIR. The text in the EIS/EIR has been revised to reflect public comments/responses. The revised text is marked with letter "R" in the left margin. The project description/mitigation measures have been modified in response to

some the agencies/public comments. The following subsection summarizes public comments and brief responses. Lists of the comment letters is provided below.

R 2.5.1 **Summary of the Public Hearing and Brief Responses to Comments:**

The U.S. Army Corps of Engineers (Corps), the Santa Barbara County Flood Control District (Flood Control District), and the City of Santa Barbara (City) held a public meeting on Wednesday evening, January 19, 2000, 6:30 PM, to give the public an opportunity to comment orally on the Draft Feasibility Study and Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR). The public meeting was held in the Council Chambers at Santa Barbara City Hall located at De la Guerra Plaza.

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**DRAFT EIS/EIR - PUBLIC REVIEW**
**LIST OF COMMENT LETTERS**

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1. United States Environmental Protection Agency
2. United States Department of the Interior
3. United States Coast Guard
4. California Governor's Office of Planning and Research, Clearinghouse
5. City of Santa Barbara Historic Landmarks Commission
6. City of Santa Barbara Architectural Board of Review
7. City of Santa Barbara Parks and Recreation Department
8. City of Santa Barbara Parks and Recreation Commission (see #7)
9. Justin Ruhge, Concerned Taxpayers of Santa Barbara County
10. Robert Bernstein, Santa Barbara Bicycle Coalition
11. Edward Cella, President, De la Guerra Homeowners Association
12. Darlene Charman, President, and Kendy Radasky, Santa Barbara Audubon Society
13. Richard A. Stromme, Railroad Advocates
14. Louise Boucher, Citizens Planning Association of Santa Barbara County
15. Eddie Harris, Urban Creeks Council
16. Maria Gordon, Small Wilderness Area Preserves, Inc.
17. Brian Trautwein, Environmental Defense Center
18. Gabrielle and Jerome Boucher
19. Lisa Ann Kelly and Family

20. David Dates
21. Jerome and Gabrielle Boucher
22. Eva Inbar
23. Gail Pearce O ' Brien
24. Dennis Hoey
25. Eduardo and Marite Gonzalez
26. Peter Gerlach
27. Antonio R. Romasanta, Harbor View Inn
28. Elihu M. Gevirtz
29. Lisa Torres
30. David Shelton and Alexandra C. Cole
31. Rita Gronhovd
32. Jana Zimmer
33. Kate Lundy
34. Teddy Gasser and Carlin Moyer
35. Charles I. Kline
36. Martin Landsfeld
37. J. D. Dale
38. John Poucher, Hollister and Brace, Attorneys at Law, for Jacques Partners
39. Francisco Zambelli

A verbatim transcript of public meeting proceedings from a videotape was prepared; the transcript is on file at USACOE, Los Angeles District Office. The following is a categorized compilation of questions, comments, and concerns raised at the public meeting. A brief response of how the comments have been addressed follows each of the topics.

**(1) Concerns – Project Alternatives:**

1-A: Add another plan: extend the box culvert from its current outlet point near the Chapala Street Bridge to the end of Mission Creek. If trees cannot be planted on top of the culvert, substitute other vegetation. *Response: At the request of the local Sponsors, the concept of extending the culvert down to State Street or Cabrillo Boulevard could be investigated during the PED phase as a design refinement. The feasibility of extending the box culvert has not undergone any engineering and environmental analyses at this*

*time; thus, the Corps could not present an opinion on whether the longer culvert would be more advantageous compared to the current design or if it is at all feasible.*

1-B: Increase both habitat and flood protection by buying more land along the corridor. Relegating the riparian corridor to two 10-foot strips in the pocket riparian zones with virtually nothing south of Highway 101 is inadequate. *Response: In our effort to balance the need for flood control improvements and environmental considerations while trying to minimize the impacts to adjacent properties, the bank protection was designed to have the sloped riprap begin halfway up the bank. Otherwise, a much wider sloping bank would be required if the entire bank is protected with riprap only. This would require numerous additional complete property acquisitions, which would result in significant additional cost and would render the project uneconomical in accordance with Federal requirements, consequently resulting in non-participation by the Corps to implement this flood control project.*

1-C: What are the differences between the channel width alternatives for the Mason Street area? Why is it important? *Response: The new channel is designed to convey stormwater flows up to 3400 cubic feet per second (3400 cfs) and will require that the channel be widened to 60 feet below Mason Street. The top of bank or top of wall for this design (60-ft wide) would generally follow the existing topography of the banks. An informal analysis performed to test the possibility of reducing the creek top width between 50 to 55 feet wide, while increasing the wall height several feet above the existing top of banks. Early indication points to the possibility of such design. During the Pre-construction Engineering and Design (PED) phase of the project, when additional detailed analysis will be performed, such design refinements to reduce the creek width would be considered.*

**(2) Concerns – Project Design:**

2-A Proposed acquisition of the property for an expanded habitat zone at the corner of the project at De la Guerra: recommend only using the slope as the expanded habitat zone in order to save the building. *Response: This design refinement requested by the City and the County has been incorporated in to the Recommended Plan.*

2-B Extend the vertical wall that is part of Ortega Bridge a short distance to save another dwelling. *(Kelly–City) Response: This design refinement requested by the City and the County has been incorporated in to the Recommended Plan.*

2-C Expand the landscaping behind the vertical wall at the Bath Street Bridge to allow vegetation to grow down and behind the wall. *Response: As part of City embellishment, some planting would be encouraged along the top of this vertical wall.*

2-D At Cota, slightly change the bridge alignment and perhaps extend the vertical wall a short distance to save the dwelling, which has some historic significance. *Response: This design refinement requested by the City and the County has been incorporated in to the Recommended Plan.*

2-E Reduce the capacity of the "sewer" lagoon by putting a portion of its capacity in a box culvert that would run down to the ocean or State Street. Might be able to clean up the lagoon better. Plant vegetation on both sides of the lagoon to create a canopy. Install a lighted walkway with trees and plants on top of the culvert. Response: See Response to comment 1-A.

2-F Build a box culvert in the De La Vina area, as well, and cover it. *Response: During the Reconnaissance phase of this study, a proposal to divert part of the stormwater flows upstream was eliminated from further consideration since it was found to cost more and the excavation required along the streets could result in significant cultural resource impacts. In addition, it would result in the creek mouth being 500 feet closer to the harbor mouth, resulting in greater siltation impacts to the Harbor. Earlier attempts by the USACOE to build a diversion structure were met with strong opposition, would have increased costs and, at the request of the City and County, the idea was abandoned.*

2-G Extend the box channel across the railroad yards: open it up, go straight, and make it really big (300 feet wide) by getting rid of the parking lot, and put the railroad on a trestle. *Response: Widening the oxbow or the culvert would be similar to Alternatives 4-7, which would be cost-ineffective and would not warrant Federal Participation.*

2-H Use pumps to pull the water out rapidly. Response: *The culverts that would be needed to convey the discharges from the pumps would have similar impacts as described in above.*

2-I Narrow State Street and Cabrillo Boulevard to give the creek more room to expand.

*Response: Replacement of the State Street and Cabrillo Boulevard Bridges were not considered in this study due to the adverse economic impacts.*

2-J Vertical walls should not extend all the way up to the estuary. *Response: As shown by Alternatives 5 and 9, where sloping banks (similar to the Consensus Group design) were applied, the additional cost of right-of-way acquisitions would render the project uneconomical and would not warrant Federal participation. As such, vertical walls would be used along this commercialized section of the project.*

2-K The design has too much concrete. *Response: The use of concrete in the structural components of the bank protection allows for a design that would minimize impacts to adjoining properties and allow planting on the riprap slope. The concrete will include aesthetic treatment so it will look like sandstone or other suitable materials as determined by the design subcommittee.*

**(3) Concerns – The Buried Culvert at the "Oxbow":**

3-A We need more information about how much excess flow this culvert will take away.

*Response: Low discharges would continue to flow through the oxbow. The culvert would be designed to begin taking overflows at discharges higher than 640 cfs. The culvert would convey approximately two-thirds of the project conveyance design capacity. The USACOE has performed detailed hydraulic analysis , included a construction of weir to insure a minimum of 640 cfs level of flow would pass through oxbow at 2.3 year level of event. This design has been coordinated with the resource agencies, particularly with the National Marine Fisheries Service (see details in Section 3.5, project description).*

3-B Is there any part of the design of the box culvert that could assist in reducing the water discharge energy at that point? (Planning Commissioner) *Response: The creekbed at the outlet of the culvert would be armored with riprap to act as an energy dissipater and prevent potential undermining of the adjacent structures.*

**(4) Concerns – Flood Control:**

4-A What type of protection will the project provide for floods that exceed the 20-year storm?

*(Planning Commissioner) Response: This project (3400-cfs design) would result in reduction of flooding from higher but infrequent events. The residual effects of flooding from higher flows are shown on the inundation maps found near the end of the main*

*report. The map shows the reduction in flooding for the 50, 100, and 500-year floods before and after the project.*

4-B If the capacity of the channel above the project area is 7,000 cfs, what is going to happen when we have a greater than 20-year storm? *Response: See response to preceding comment. Residual flooding would still occur during events greater that 3400 cfs. The residual flooding would be decreased incrementally by the increased capacity of the creek.*

4-C Is there a cutoff point from a cost-benefit standpoint? *(Planning Commissioner) Response: In order for this flood control project to warrant Federal interest, the B/C ratio has to be equal to or greater than 1:1.*

4-D The project should be redefined to accommodate 3,210 cubic feet per second (cfs), which is what the consensus group agreed to. This would narrow the channel a couple of feet, which is important. *Response: The Lower Mission Creek Feasibility Study Executive Committee directed the study team to focus on 3400 cfs as established by the bridge constraint; the conveyance capacity of the State Street Bridge. Also, the difference of 190 cfs between the alternatives would be insignificant during hydraulic design consideration.*

4-E What effect will increasing Mission Creek's capacity have on the area to the east of the project area? *Response: The annual expected damages for the Laguna Drainage Area would be reduced by about 27%, while the damages to the Lower Mission Creek Drainage area would be reduced by about 47%.*

4-F What would it take to give us greater capacity, either through some alternative channel or some alternative solution? *Response: Increasing the capacity while maintaining the natural bottom of the creek could be facilitated by replacing all existing bridges and acquiring additional properties along the entire creek to allow for a wider creek. However, the costs would be greater than the benefits, resulting in a project that is not economically feasible.*

**(5) Concerns - Erosion Problems:**

5-A Historically, flood water has washed out behind the vertical walls and taken away the bank. Isn't that still possible with the vertical walls in the project design? *(Planning Commissioner) Response: The proper sizes or grade of riprap would be used to prevent washing away of fill behind the walls.*

5-B We need more specific examples of what you're going to do to ensure that the earth doesn't wash away. Response: *See the preceding response. During the final design, more details would be made available for review.*

**(6) Concerns - Biological Resources:**

6-A Vertical walls on the sides of the estuary are not compatible with tidewater Goby habitat, which requires vegetated sloping banks. *Response: In existing conditions, the estuary between Mason Street and Cabrillo Boulevard has vegetated sloped banks only on the left side of the creek. Upstream of State Street, bout 275 linear feet could be described as sloped and vegetated banks. But Remaining banks in the estuary has artificial and vertical walls, either of wood, gabions, concrete or cemented sand banks.*

*Structural features have now proposed as part of project design to mitigate effects on both tidewater gobies and steelhead. These features include ledges which project into the creek, rows of large rocks placed against the walls, and high-relief ribs formed into the wall's surface. (see Section 10 for details of their design, placement and purpose). The additional cost of right-of-way acquisitions would render the project economically infeasible.*

6-B The area below Cabrillo Bridge is very important for tidewater Goby habitat and should be included in a comprehensive creek management plan. *Response: The presence of the Endangered Species in the lagoon limits the activities affecting this area for this flood control project. The City, as part of its larger Clean Water and Creek Restoration Program, would consider the appropriate management of the lagoon.*

6-C The channel bed will be a biological desert (because of silt removal and herbicide spraying), leaving only thin strips of vegetation along the banks—where there are banks. *Response: The mosaic removal of streambed vegetation would allow growth of non-obstructive vegetation while maintaining the flood control design capacity.*

6-D Widening the creek bed increases maintenance responsibilities, which has environmental impacts. The creek bed doesn't have high environmental values because of maintenance. The creek banks do, since they contain the habitat. They should be made wider by buying stream-side properties and further laying back the banks where there are proposed walls. Response: *See response to comment 2-J.*

6-E When was the last time a steelhead trout was caught in Mission Creek? *Response: Numerous sighting of steelhead have been recorded in the past, including sighting by the*

*California Department of Fish and Game Staff. Sightings have been reported as recently as spring 2000*

6-F The EIS/EIR should contain more details on the environmental impacts of flood control on estuary activity. *(Planning Commissioner) Response: The Biology Section of the EIS/EIR includes discussions on impacts to the estuary.*

6-G The EIS/EIR should contain a discussion of the Laguna wetlands proposals that are part of the project. *(Planning Commissioner) Response: There is no proposal in this project for the Laguna Channel estuary.*

**(7) Concerns – Water Quality:**

7-A Include in the final report more discussion of the hazardous materials discharging into the creek. *(Planning Commissioner) Response: See the Water Quality Section of the EIS/R for more discussions on water quality.*

7-B Creek widening may accommodate even more shopping carts and other trash. *Response: Preventing the creek from becoming a trash receptacle would require everyone's participation. Trash receptacles located near bridges would help remind folks where trash belongs.*

7-C The alternatives do not provide adequate shading to maintain proper water temperatures, which are important because dissolved oxygen and nutrient balances depend on maintaining temperatures and the proper ranges. *Response: A shading study has been completed and included in the Biology Section of the EIS/R. Extensive shading would be realized within five years and after ten years, coverage of the wider creek would nearly be complete. Currently, at the lowest reach, hardly any shading is available. A temperature study has been completed, which concludes that, even in shaded areas, water temperatures in the lower creek are consistently higher than is typical of streams which steelhead use.*

7-D The vertical walls minimize the potential for vegetation that is necessary to enhance water quality. *Response: See responses to comments 1-B, 2-I and 2-J.*

7-E The preservation of historic buildings should not take priority over water quality. It would be better to relocate the historic structures. *Response: The preservation of historic buildings is part of the City's effort to mitigate or avoid the impacts of this project on the cultural resources of Santa Barbara, as required by City General Plan policies. The City*

*has other programs, outside the scope of this project, that would focus on improving the quality of surface runoff that reaches the creek.*

7-F Recommendation on how the project should deal with contaminants identified in the County/City Joint Stormwater Pollution Prevention Plan: install filters on the storm drain outlets. *Response: The Joint City and County Stormwater Pollution Prevention Program would complement this flood control project after completion. These types of water quality measures are beyond the scope and authority of this project.*

7-G The project should take responsibility for and address the state and health of the creek waters all the way to the ocean. *Response: To the degree that this project may affect the estuary below Cabrillo boulevard, such impacts have been addressed in the EIS/EIR. Additionally, the City has a Creek Water Quality Improvement Project to improve the water quality of the City's creek and beaches. This effort will include many of the Best Management Practices such as public education/outreach, public participation, elicit discharge detection/inspection, construction site runoff inspection/control, and many other water quality improvement measures.*

7-H In the estuary area, sloped vegetated banks along the edges are better than concrete vertical walls to act as a biofilter. The plants will remove some of the pollutants as the water goes through them. *Response: Although it would be desirable to have sloping vegetated banks for the entire project, the economic requirement of this project would not support such design.*

7-I Increase the native paintings along and on top of the banks to enhance bio-filtration.

*Response: The amount of planting on the riprap as currently described has been figured into the hydraulic design of the creek and how it would affect the conveyance capacity of the creek. As much planting on the slopes as allowable has already been included.*

**(8) Concerns – Aesthetics:**

8-A Can aesthetic improvements to the Cabrillo Boulevard Bridge be included in the project?

*(Planning Commissioner) Response: The City is already planning for retrofitting and upgrading Cabrillo Boulevard Bridge. It will go through the Historic Landmarks Commission for design review to assure that meets City design standards. The bridge would carry the design capacity, thus, it would not need any modifications.*

8-B Include in the final report an inventory of trees so that we can consider whether we want to lose them or save them and lose something else. *(Planning Commissioner) Response: See the Biology Section of the EIS/R for inventory of significant trees.*

8-C Include in the final report a discussion of the bridge walls to be demolished and whether the old stone can be saved, conserved, reused in other parts of the project, or stored at the city for some future use. *(Planning Commissioner) Response: The City plans to reuse salvageable historic masonry for use locally, perhaps in the design of the new bridges or elsewhere in the City.*

8-D Vertical walls and the bridges should be replicated in Italian stone mason fashion.

*Response: A local design subcommittee would develop the final surface design and color treatment of vertical walls. As currently proposed, the surface treatment would imitate the sandstone masonry commonly used locally.*

8-E One-gallon trees are insufficient. They should be 15-gallon at a minimum. And there should be many more. *Response: It is generally accepted that the resiliency and the mortality of the types of trees proposed to be planted along the banks could be greatly aided by growing them from nursery stock. Smaller trees actually grow faster and establish better root systems than do larger trees. For this reason, younger saplings would be used. However, the City may provide some additional larger trees to establish a more finished appearance in some locations. The number of trees and their spacing is mainly a function of the ability of the wall structure to allow a notch through the heel of the wall footing for the roots to penetrate through, and avoid potential undermining of the wall structure. The spacing could be reduced to perhaps 20' instead of 40'. However, modifications to the wall footing will be required. An increase in construction cost could be expected. This opportunity could be pursued during the final design, if the local sponsors would share the additional construction costs. It should also be noted that, if the larger trees, such as sycamores, are placed too close together, they will not develop broad canopies that proved the most shade. Shallow-rooted willows will be placed between the larger trees to create lush vegetation and shade fairly quickly, until the larger trees grow enough to over shade them.*

8-F The proposed aesthetic treatments should take into the account the views from the bridges as well as the banks. You're going to see the cement from the bridges. You should put in a lot more bank vegetation to hide the cement. The goal should be to make Lower Mission Creek looking like Rocky Nook Park and the Museum of Natural History as much as possible. *Response: See response to comment 8-D.*

8-G We need more specific examples (photos) of aesthetic treatment proposals for the bridges and banks. Sticking a row of trees on the top of a bank won't do much. *Response: Final design of the aesthetic treatment for walls and bridges would be developed and coordinated by the City and a local design subcommittee. Please refer to the Architectural rendering found in the back of the Main Report.*

8-H If you're going to provide trees to homeowners to plant in their backyards, you must guide them as to the right places and planting procedures, or it won't do any good. *Response: The City plans to solicit the support of the appropriate local concerned groups and individuals to administer this program.*

8-I What is the culvert bypass going to look like? *Response: The culvert would be a pair of 15' X 6' concrete boxes with a weir structure at the inlet. It would be open when it crosses underneath Highway 101 and would be covered until it daylights alongside the Chapala Street Bridge.*

8-J Widening the creek means that you won't get shade in the creek bed from the trees for decades. *Response: See* shade discussion in the Biological Resources Section.

8-K Use computer modeling to generate shading patterns from the trees. *(Planning Commissioner) Response: See response to comment 8-J.*

**(9) Concerns – Public Safety:**

9-A Walkway across the creek could create lighting, security, and liability problems. *Response: This project does not include any walkways across the creek.*

9-B Lighting should be installed in the pocket parks and on the bridges to reduce the possibility of vandalism. *Response: The City, as part of local project embellishments, would include appropriate features to address such concerns.*

**(10) Concerns – Socioeconomics:**

10-A The proposed walkway along the creek in the vicinity of the Chapala Street Bridge would adversely affect the neighborhood: bright lights shining into homes and a loss of privacy. It would be better to extend the culvert. *Response: This project does not include walkways along the Chapala Street section.*

10-B Property owner objection to move house at 116 Chapala Street just to create a pocket park. City's assessment to determine which structures are cost-efficient to move is somewhat flawed. No one has determined whether this house is movable. *Response: Based on the corrections to the City map used by the Corps in this study, the required clearance for the new creek width across 116 Chapala Street is in fact available. Therefore, removal or relocation of the subject structure would no longer be required.*

10-C Buildings should be moved out of the riparian corridor because they are encroachments.

*Response: The cost of numerous additional complete property acquisitions to accommodate more sloping banks would significantly increase the project cost so as to render the project uneconomical in accordance with Federal requirements and would result in non-participation by the Corps.*

10-D Vertical walls should not be extended to protect structures. There is too much vertical wall. *Response: See response to comment 10-C.*

10-E Four structures now slated for saving by extending the vertical wall should be reconsidered for removal: on Ortega Street, at the corner of Ortega and Bath, on Cota and Bath, and near De La Vina and Halley. *(Planning Commissioner) Response: See response to 10-C.*

**(11) Concerns - Recreation:**

11-A What will public access to the creek be? People will have a vested interest in keeping the creek clean if they have greater access. *(Planning Commissioner) Response: Due to safety concerns, access to certain areas of the creek would be controlled. The City and the County would encourage creek access by using the expanded habitat zones.*

11-B Is there an opportunity to use the lower creek around State and Cabrillo as a tourist attraction (maybe a creek walk)? *(Planning Commissioner) Response: Similar improvement for this area is under consideration by the City through another City project.*

11-C Support pocket parks. *Response: Comment Acknowledged.*

**(12) Concerns – Maintenance:**

12-A How will you take care of trash in the creek? *(Planning Commissioner) Response: The City would primarily be responsible for removing trash from the creek. The County would remove trash or debris that would obstruct creek conveyance.*

12-B Have you given consideration to a street-sweeping program to help keep the creek clean? *(Planning Commissioner) Response: The City is looking into the possibility of extending existing street sweeping efforts to include areas along the creek.*

12-C What will you do if flooding and erosion destroy the vertical walls? *(Planning Commissioner) Response: Any repair needed to maintain or restore the efficacy of the project as designed would be accomplished by the Flood Control District as soon as possible, including repair of vertical walls.*

12-D Who will maintain the box culvert, and how will it be maintained? *(Planning Commissioner) Response: The Flood Control District would have the maintenance responsibility of the creek. Debris or silt would be pushed to either end of the culvert where a loader would transfer the spoil into trucks for disposal. However, based on the proposed design, it is anticipated that very little culvert maintenance will be required.*

12-E Install permanent trash cans at the bridges. *Response: This would be considered by the City to discourage disposal of trash into the creek.*

12-F Trash in the creek needs to be cleaned out more than four times a year. *Response: See response to comment 12-A.*

12-G Maintenance should result in minimal disruption to native paintings on the creek bottom and slopes. *Response: To maintain the flood control capacity of the creek, intermittent removal of creek bed vegetation in a mosaic pattern would be needed.*

12-H clear the streambed in a mosaic pattern to leave some plants at different periods of time to enhance regrowth. Response: *See Response to comment 12-G.*

12-I The high threshold for silt removal should be 25 percent. *Response: County Flood Control uses a 15% threshold for silt removal for maintenance scheduling purposes; however, the flood protection that would be provided by the project is based on a clean*

*streambed. There may be a corresponding reduction in conveyance if the siltation is not removed.*

12-J Disturbances upstream that would contribute to erosion should be strictly monitored and not allowed. *Response: Any work pertaining to the creek banks would require permitting and would be subject to inspections by City or County Officials.*

12-K The maintenance plan should be developed with community participation. *Response: The maintenance plan developed by the County Flood Control and incorporated into this project was developed with inputs from concerned organizations locally.*

12-L The EIS/EIR should contain more details on the environmental impacts of abatement measures, application of herbicides, and scraping or scouring. *(Planning Commissioner) Response: See the Biology Section of the EIS/R for discussion on impacts of different abatement measures.*

**(13) Concerns – Cumulative Impacts:**

13-A The La Entrada Project at the intersection of State and Mason Streets. Did the City of Santa Barbara notify the Corps of Engineers of this project? Were Alternative 12's impacts on this project evaluated in the EIS/EIR? *Response: The La Entrada project was approved by Planning Commission in July 1, 1999, and by the City Council on August 17, 1999. To the extent that plans for the Lower Mission Creek project were known, they were considered. This project was reviewed against LCP Policy 12.2. Cumulative review of projects under the policies is not required. It will be necessary for decision makers to evaluate the Lower Mission Creek project against this policy at the time final decisions on the City's participation are made. As a result of concerns raised by Coastal Commission members and staff based on policy concerns, the project applicant has proposed a redesign that would set the new building 25 feet back from the projected creek width in the event that the creek is widened to bring it closer to the proposed new development on the Californian Hotel property. The removal of the building at 15 West Mason Street would result in the existing and any proposed buildings at 35 State Street being outside the 25 foot setback for the flood control project.*

13-B There must be a buffer between the La Entrada Project and the Harbor View Inn Project and the flood control project. *Response: See response to comment 13-A. The Harbor View Inn expansion was approved in March 1999, based on the 60-foot width. As the Municipal Code allows, the Planning Commission granted a waiver to allow some of the new building on the east side and part of the parking lot on the west side to encroach into*

*the 25 foot setback. However, unlike the existing situation, there would be a native landscape buffer on the westerly side of the creek. In addition, the landscaping in the parking lot on the east side of the creek would also consist of native species, which is not the case at the present time.*

**Concerns – Other:**

**(14)**

Planning Commission should look at ways to guide future development so that it doesn't add to water coming down the creek. *Response: Comment acknowledged.*

14-A

This project should be just the initial phase of a long-range plan to restore all reaches of Mission Creek (establishing adequate buffer zones, acquiring properties and easements over time, compelling property owners to remove encroachments and impervious surfaces from the creek, and providing incentives for gradual retreat). *Response: Comment acknowledged.*

14-B

The City of Santa Barbara Redevelopment Agency (RDA) funds of $2.5 million to augment the restoration components of the flood control project should be spent to buy additional riparian properties for riparian habitat. *Response: The RDA funds are allocated for use to supplement the project and pay for improvements to features already included in the design that would be beyond what the Corps could cost-share. Money from the RDA cannot be used to improve flood control. The Agency funding available would only purchase a very small number of properties due to land and relocation costs. Agency funding can be used more cost-effectively to increase planting, improve project appearance and provide park amenities.*

14-C

# SECTION - 3 - ALTERNATIVES

## 3.1 ALTERNATIVES:

In the development of alternatives, extensive coordination occurred between the U.S. Army Corps of Engineers (USACOE), Santa Barbara County, the City of Santa Barbara and concerned business/property owners and environmental groups. Several public workshops and a formal public scoping meeting were conducted to obtain public views regarding the project and development of alternatives. Previously prepared engineering and environmental reports have been reviewed to identify problems and development of the alternatives. The alternatives were evaluated based on past flooding history and the need to provide flood protection to the City of Santa Barbara. In the development of alternatives, protecting properties or reducing the flood threat to the residences and businesses located in the vicinity of Lower Mission Creek and preservation of the environment were considered.

## 3.2 BACKGROUND INFORMATION:

The process of plan formulation in this study was initiated in 1969. The 1969 improvement plan included: (1) a debris basin just downstream from Foothill Road; (2) a concrete lined channel from the debris basin to Oak Park (just above Highway 101); (3) a covered concrete channel to divert flows under Highway 101, Southern Pacific Railroad and under Modoc Road to Las Positas Road in the adjacent Arroyo Burro drainage area; and (4) a concrete channel along Las Positas Road and Arroyo Burro Creek to the Pacific Ocean. This plan was rejected by the local community on the basis that implementation of this plan would result in significant impacts to environmental resources including biological and aesthetic resources.

In the early 1970's, the USACOE continued their Mission Creek studies in conjunction with the Environmental Quality Advisory Board of the City of Santa Barbara.

In 1978 and 1980, the local sponsor again became interested in pursuing flood protection along Lower Mission Creek. In 1986, the USACOE completed a Feasibility Study, which included structural and no-action alternatives. The alternative recommended in the 1986 feasibility study, referred to as the Lower Mission Creek Project, was authorized by Congress (see details in Main Report, Formulation of Alternative Plans). This project was later determined to be technically infeasible.

In 1993, the City and County of Santa Barbara established the Mission Creek Consensus Group to develop alternatives for flood control on lower Mission Creek. The Consensus Group included two members of the Santa Barbara County Board of Supervisors, two members of the Santa Barbara City Council and representatives of property owners, business owners and environmental groups. Staffing and technical support were provided by the City, the County and the USACOE. The Consensus Group worked together for over a year to develop and analyze possible alternatives that would be acceptable to them and to the community. At the conclusion of the analysis, the Consensus Group made the following recommendation:

> *25-year flood protection (before the floods of 1995, 3210 cfs was thought to constitute a 25-year flood event, after the floods it was determined to be equivalent to an 18-year flood event), with one half horizontal to one vertical (0.5:1) vegetated stabilized sloped banks along the entire project reach with allowance for vertical walls under bridges and at other points of constraint due to buildings or other right-of-way considerations.*

This recommendation was accepted on a 7-1 vote. It was further explained that "vegetated stabilized sloped banks may be constructed with any combination of the following treatments: stepped walls, partial walls, various reinforced earth treatments and gabions." The Consensus Group also indicated that other alternatives should be considered. These included an alternative very similar to the recommended alternative, except that vertical walls would be predominant south of the freeway with allowance for sloped banks where right-of-way allows a more natural treatment. Another alternative for consideration was full 100-year flood protection; however, this alternative was ranked substantially lower than the other alternatives to be considered. It should be noted that prior to the floods of 1995, 3210 cfs was thought to constitute a 25-year flood event.

The USACOE performed a new reconnaissance study in November 1995. This study was based on the Kennedy/Jenks Consultants Report and the recommendations of the Mission Creek Consensus Group discussed above. The Reconnaissance Report looked at several alternatives including non-structural, and no-action alternatives. Non-structural alternatives included (1) flood plain management; (2) flood proofing; and (3) relocation. Structural measures included: (1) conveyance improvements; (2) diversion; and (3) environmental restoration.

Two conveyance improvement alternatives were developed in the Reconnaissance Phase. One alternative would provide 3210 cfs (cubic feet per second) conveyance and the another would provide 5800 cfs conveyance. The 3210 cfs conveyance alternative consisted of a natural

bottom channel with stabilized banks at a 0.5 to 1 slopes and vertical walls. Gabions were proposed for the 0.5 to 1 slope upstream of Highway 101 and vertical walls were proposed downstream of Highway 101. The second conveyance improvement alternative, 5800 cfs, was developed directly from the Kennedy/Jenks Report. The 5800 cfs alternative is essentially the same as the 3210 cfs alternative with the exception of increased base widths to provide the additional capacity. The Environmental Restoration alternative considered three elements: (1) modification of the estuary to permit more frequent salt water penetration during low channel flow periods; (2) re-establishment of a riparian corridor along the creek; and (3) upstream improvements to facilitate salmonid migration (see details in Main Report-chapter IV, Plan Formulation).

**Feasibility Phase Plan Formulation:**

During Feasibility and Reconnaissance phase studies various alternatives were examined, which included the 5800 cfs and 3210 cfs conveyance capacity and the Environmental Restoration alternatives. A third conveyance alternative was developed during the feasibility phase: the 2500 cfs alternative. This alternative was analyzed to minimize requirements for purchase of real estate. The hydraulic analysis determined that the highest conveyance achievable without replacing the three bridges at State Street, Cabrillo Boulevard and Bath Street was 3400 cfs. Therefore, one of the conveyance alternatives studied in detail in the Feasibility Report was the 3400 cfs alternative. Details about alternatives that were not examined are provided in following paragraphs.

Twelve alternatives, described in the Main Report, Chapter IV, were formulated during the Feasibility Study, including the No Action Alternative. Sections 3.4 and 3.5 of this EIS/EIR provides descriptions of all twelve alternatives.

In this Environmental Impact Statement/ Environmental Impact Report (EIS/EIR), alternatives are divided in three groups: (1) plans eliminated from further engineering and environmental study; (2) technically applicable but economically not feasible alternatives not evaluated for environmental analysis; and (3) alternatives considered in detail for engineering and environmental evaluation. In addition, alternatives for bank stabilization are also discussed in this report. These three groups of alternatives are described in the following paragraphs.

## 3.3 PLANS ELIMINATED FROM FURTHER STUDY:

To ensure that the best possible plan for the solution of Santa Barbara's flood control problems were identified, both structural and nonstructural methods were studied.

### 3.3.1 Nonstructural Alternatives:

In the 1986 Feasibility Study, all nonstructural alternatives along Mission Creek suggested by the Mission Creek Alternatives Task Force were considered. These included: (1) a flood plain management plan incorporating flood insurance, restrictions on development in the flood plain and maintenance of a flood warning and evacuation program; (2) a flood proofing plan; and (3) a relocation program.

#### 3.3.1.1 Floodplain Insurance:

Since 1978, the City has participated in the National Flood Insurance Program. This program helps property owners to recover their property or economic loss resulting from flooding. The property owner is required to pay deductible costs for each flood event. They will receive the benefit of the maximum limit of insurance available. However, this insurance program does not cover certain damages including: basements, yard areas, and damage to city and county facilities.

#### 3.3.1.2 Flood Proofing:

There are several non-structural flood proofing measures that can be utilized in order to protect property from floods. These measures range from minimizing the way water comes in contact with damageable items to raising (jacking) the first floor of a structure above a particular flood surface elevation, or building a wall (ring dike) around existing structures to protect them from flood inundation.

#### 3.3.1.3 Relocation:

Relocation of structures in the flood plain was considered. However, Santa Barbara is a highly developed area which has very little space to relocate structures out of the floodplain. In addition, relocation is very expensive, especially in an older community where most properties are already developed.

### 3.3.2 **Structural Alternatives Eliminated from Further Consideration:**

#### 3.3.2.1 **5800 cfs Conveyance Capacity:**

The channel capacity would be expanded to 5,800 cfs. In order to obtain required capacity, a greater invert width would be required. In addition, the bypass would be expanded to a triple 8 foot by 16 foot box culvert.

Hydraulic modeling of the conveyance alternatives determined that 5800 cfs conveyance was not feasible due to bridge constraints at Bath Street, State Street, and Cabrillo Boulevard Bridges. Replacement of these bridges was considered; however, due to their location, and cost of reconstruction, replacement of the bridges was not economically feasible. In addition, more real estate would need to be purchased in order to construct this alternative. The added costs of replacing these bridges and acquiring additional real estate would likely yield a benefit cost ratio less than 1:1; therefore, this alternative has been eliminated from further consideration.

### 3.3.3 **Bank Stabilization Alternatives Eliminated From Further Consideration:**

The following alternatives for bank stabilization have been examined but not implemented for the proposed project, primarily due to economic infeasibility.

#### 3.3.3.1 **Natural Bank Protection:**

This alternative consists of leaving the banks and channel bottom natural. This bank protection alternative was not pursued due to the steep slopes that will be required, i.e. 0.5 to 1 side slope and less, in order to achieve project objectives for increased flood capacity without extensive widening of the channel. Widening of the channel would be greater than that proposed under Alternative 12. This would result in project costs exceeding project benefits due to real estate acquisition costs.

#### 3.3.3.2 **Geotextile Bank Protection:**

This alternative consists of using geotextile material as bank protection. The channel bottom would remain natural. This bank protection alternative was not pursued due to the steep slopes that will be required, i.e. 0.5 to 1 side slopes and less, which will not achieve project

objectives. This alternative would be subject to the same stresses as the natural bank protection and would require the same type of analysis. Acquisition costs would be similar.

3.3.3.3 **Grouted Riprap Bank Protection:**

This alternative consists of using grouted riprap without vertical walls as bank protection. The channel bottom would remain natural. This bank protection alternative was not pursued due to the steep slopes that will be required, i.e., 0.5 to 1 side slopes and less. The minimum side slope for stable riprap placement is 1.5 to 1.

3.3.3.4 **Fully-lined Concrete Channel:**

This alternative was not pursued since lining the channel bottom would be environmentally damaging. Implementation of this alternative would have significant impacts on biological, aesthetic and water resources.

## 3.4 ALTERNATIVES NOT EVALUATED FOR ENVIRONMENTAL ANALYSIS:

Twelve structural Alternatives were evaluated during the Feasibility Study. These alternatives included a No Action Plan, a 2500 cfs capacity with two different channel configurations, and a 3400 cfs capacity with nine different channel configurations. Differences in channel configuration are due to the use of the oxbow-bypass and different combinations of bank protection. Alternatives 2 and 3 would be designed to convey a flow of 2500 cfs, providing about a 15-year level of protection, and Alternatives 4 through 12 would be designed to convey a flow of 3400 cfs, which would provide about a 20-year level of protection.

After the Alternatives Formulation Briefing, based on environmental benefits and the cost benefit ratio, a decision was made that Alternative 12 provides the most incidental environmental benefits and meets the required cost benefit ratio. The twelve alternatives were developed during the feasibility study. However, these alternatives were similar in nature; therefore, based on criteria, similarities and differences in the basic design features, the decision was made to evaluate four Alternatives for detailed environmental analysis in the EIS/EIR. They are Alternatives 1, 6, 8, and 12. Alternative 1 continues to be the No Action plan against which the consequences of structural solutions are evaluated. Details of these Alternatives are described in Section 3.5 of this document. The selected Alternatives have different basic design features and are summarized below in Table 3.4-1.

R In the Draft EIS/EIR, the remaining eight Alternatives were not evaluated further for environmental analysis. Based on the economic analysis performed during the feasibility study phase, four of them, Alternatives 2, 3, 5, and 9, did not meet the benefit to costs (b/c) ratio, these alternatives were not evaluated in the Draft EIS/EIR.

**Table - 3.4-1**

**Comparison of Design Features**

Only these Alternatives are evaluated further. Alternative 12 has been identified as the NED (National Economic Development) and tentative preferred plan.

| Design Feature | Alt. 6 | Alt. 8 | Alt. 12 (NED) |
|---|---|---|---|
| Conveyance capacity | 3,400 $ft^3$/sec | 3,400 $ft^3$/sec | 3,400 $ft^3$/sec |
| Oxbow bypass | no | yes | yes |
| Some vertical walls | yes | yes | yes |
| Some stepped walls | yes | no | no |
| Some riprap slopes with native vegetation above short vertical walls | no | no | yes |

R During preparation of the Final EIS/EIR and revised biological assessment, extensive coordination occurred with the concerned resource agencies. The project design and mitigation have been modified due to the resource agencies/public concerns and real estate constraints. Additional mitigation features have been added in the project design to minimize impacts to Federally listed endangered and threatened species. The economic analysis was updated to incorporate costs of the modified project design, mitigation features and real estate. Based on revised economic analysis, Alternatives 2, 3, 5, 6, 7 and 9 do not meet economic requirements.

R At request of the California Coastal Commission (CCC) and in response to public comments, the USACOE performed an informal economic analysis of two smaller versions of the Recommended Plan; both would have a conveyance capacity of 2500 cfs providing approximately 15-year level of protection. The first alternative would use the combination toe

wall and riprap slope (similar to the Recommended Plan) to protect and stabilize the creek banks, and the second alternative would use riprap slope protection to stabilize the entire height of the banks. Both alternatives would apply the proposed bank protection upstream and downstream of Highway 101. Results of this informal analysis can be found in the Economic Appendix of the Main Report. Available information from the earlier 2500 cfs Alternatives found in the feasibility report, including construction costs, right-of-way costs and damage reduction benefits were used in this analysis. The results indicate that these two alternatives would not be economically feasible and therefore would not warrant Federal participation. Like the other previously analyzed alternatives that are not economically viable, these alternatives would not have been carried forward for detailed analysis in plan formulation and the EIS/EIR.

R Alternative 6 was evaluated in the Draft EIS/EIR, and it was economically feasible as per economic analysis performed during the Feasibility study. However, the updated economic analysis revealed that this alternative is no longer economically feasible. However, the environmental analysis of the Alternative 6 has been included in the Final EIS/EIR, because Alternative 6 contains features that are not included in the other evaluated Alternatives in the Final EIS/EIR.

The various design features of Alternatives 4, 6, and 7 have corresponding equivalents in Alternatives 8, 10, and 11. Alternative 12 also corresponds to design features of Alternatives 10 and 11. Based on those equivalencies, further environmental evaluation has not been performed for Alternatives 4, 7, 10, and 11. Plans of all alternatives except Alternative 1 are provided in the Main Report. The Alternatives not evaluated further for the environmental analysis are briefly described in the following paragraphs. ***The numbering of Alternatives is kept the same as the Main Report for consistency and comparison purposes. The Main Report describes all 12 Alternatives formulated during the feasibility study. Alternatives are presented in the EIS/EIR are not in a sequential order. Description and evaluation of the preferred Alternative 12 is provided first followed by other alternatives evaluated for the environmental resources.***

R 3.4.2 **Description of Alternatives Technically Feasible but Economically and Infeasible and Not Evaluated for Environmental Analysis**:

During feasibility study following alternatives were examined in details for their technical and economical feasibility. The alternatives provided in the following paragraphs are technically feasible but economically not feasible, therefore detailed environmental evaluation has not been performed.

3.4.2.1 **Alternative No. 2: 2500 cfs Capacity - Stabilized sides using combination vegetated stepped walls and vertical walls.**

This alternative would increase the channel capacity to 2,500 cfs and would provide approximately a 15-year level of protection. The natural bottom would be maintained and would consist of stabilized banks at a 2:1 (V:H) slope above Highway 101. Below Highway 101, vertical walls would be the dominant bank treatment with sloped bank treatment applied whenever practicable. The channel width would range from 36 to 56 feet at the top of the bank, except between the State Street and Cabrillo Boulevard Bridges, where the top width would be from 60-70 feet. The average depth of the creek would be about 8 to 12 feet. The improved creek would generally follow the existing alignment. Six bridges along the study reach would be replaced, including the Ortega Street, Cota Street, Montecito Street, Union Pacific Railroad, Chapala Street, and Mason Street Bridges. This alternative has not been evaluated for the detailed analysis because it is not economically feasible.

3.4.2.2 **Alternative No. 3: 2500 cfs Capacity - Stabilized sides using vertical walls.**

This alternative is similar to Alternative 2, except that the sides would be stabilized using vertical walls only. The channel width would range from 30 to 50 feet at the top, except between the State Street and Cabrillo Boulevard Bridges, where the top width would be 60 to 70 feet. The average depth of the channel would be approximately 8 to 12 feet. Also, the same bridges would need to be replaced. This alternative is also not economically feasible.

3.4.2.3 **Alternative No. 4: 3400 cfs Capacity Without Oxbow Bypass - Stabilized sides using vertical walls.**

This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of protection. The natural bottom would be maintained while bank treatment would consist of concrete vertical walls throughout the project reach. The improved creek would generally follow the existing creek alignment. The channel would be from 44 to 60 feet wide at the top of the bank, except between the State Street and Cabrillo Boulevard Bridges, where the top width would be 60 to 70 feet wide. The average depth of the channel would be 8 to 12 feet. Seven bridges along the study reach would be replaced, including the Ortega Street, Cota Street, De la Vina Street, Montecito Street, Union Pacific Railroad, Chapala Street, and Mason Street Bridges.

Lower Mission Creek develops a meandering course near the downtown section of Santa Barbara. Due to the meandering course of the creek, an oxbow has developed between Yanonali and Gutierrez Streets. This alternative would involve stabilization of the creek banks and modification of the creek course along the oxbow, including demolition of the existing sandstone channel. Construction along and/or within the oxbow area is called the "*Without Oxbow Bypass*".

R The location of the oxbow is shown on Figure 3.5-2. This alternative has similar design features as alternative 8, and the environmental impacts would be the same as Alternative 8.

3.4.2.4 **Alternative No. 5: 3400 cfs Capacity Without Oxbow Bypass - Stabilized sides using vegetated stepped walls.**

This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of protection. A natural bottom would be maintained and would consist of vegetated stepped banks at a 2:1 (V:H) slope throughout the study reach, except at the south end of the oxbow along the railroad tracks. The improved creek would generally follow the existing alignment throughout the project reach. The creek would be 50 to 70 feet wide at the top of the bank and 8 to 12 feet deep. Seven bridges along the study reach would be replaced, including the Ortega Street, Cota Street, De la Vina Street, Montecito Street, Union Pacific Railroad, Chapala Street, and Mason Street Bridges. Alternative 5 is not economically feasible.

3.4.2.5 **Alternative No. 7: 3400 CFS Capacity Without Oxbow Bypass - Stabilized sides using combination vegetated stepped walls and vertical walls.**

This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of protection. A natural bottom would be maintained and would consist of stabilized banks at a 2:1 (V:H) slope above Highway 101. Below Highway 101, vertical walls would be the dominant bank treatment. The improved creek would generally follow the existing alignment throughout the project reach. The creek would be 50 to 70 feet wide at the top of the bank and 8 to 12 feet deep. Seven bridges along the study reach would be replaced, including the Ortega Street, Cota Street, De la Vina Street, Montecito Street, Union Pacific Railroad, Chapala Street, and Mason Street Bridges. This Alternative does not meet federal economic requirements.

3.4.2.6 **Alternative No. 9: 3400 cfs Capacity with Oxbow Bypass - Stabilized sides using vegetated stepped walls.**

This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of protection. A natural bottom would be maintained and would consist of vegetated stepped banks at a 2:1 (V:H) slope throughout the study reach, except at the oxbow and the new culvert. This alternative would incorporate a new culvert, by-passing the oxbow just above Highway 101 to the Chapala Street Bridge. The improved creek would generally follow the existing alignment except at the oxbow which would be left in place to function as a low flow channel. The oxbow bypass would carry high flows. The creek would be 50 to 70 feet wide at the top of the bank. The average depth of the creek would be about 8 to 12 feet. Five bridges along the study reach would be replaced, including the Ortega Street, Cota Street, De la Vina Street, Chapala Street, and Mason Street Bridges. Alternative 9 can not be implemented because it does not meet federal economic requirements.

3.4.2.7 **Alternative No. 10: 3400 cfs Capacity With Oxbow Bypass - Stabilized sides using predominantly vegetated stepped walls with vertical walls applied for the remaining reaches.**

This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of protection. A natural bottom would be maintained and the sides would consist of vegetated stepped banks at a 2:1 (V:H) slope upstream of Highway 101. Below Highway 101, vegetated stepped walls would be applied along the southeast bank, starting from midway between Chapala and Mason Street Bridges to State Street, and along the middle third of the southwest bank between Mason Street and State Street. Vertical walls would be maintained for the remainder of this reach. This alternative would incorporate a new culvert, by-passing the oxbow just above Highway 101 to the Chapala Street Bridge. The improved creek would generally follow the existing alignment except at the oxbow which would be left in place to function as a low flow channel. The oxbow bypass would carry high flows. The creek width would range from 50 to 70 feet at the top of the bank. The average depth of the creek would range from 8 to 12 feet. Five bridges along the study reach would be replaced including the Ortega Street, Cota Street, De la Vina Street, Chapala Street, and Mason Street Bridges. Alternative 10 is not evaluated for the environmental analysis because it does not meet the required benefit to cost ratio.

3.4.2.8 **Alternative No. 11: 3400 cfs Capacity with Oxbow Bypass - Stabilized sides using combination vegetated stepped walls and vertical walls.**

This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of protection. A natural bottom would be maintained and would consist of stabilized banks at a 2:1 (V:H) slope above Highway 101. Below Highway 101, vertical walls would be the dominant bank treatment with sloped bank treatment applied whenever practicable. This alternative would incorporate a new culvert to carry high flows, by-passing the oxbow just above Highway 101 to the Chapala Street Bridge. The improved creek would generally follow the existing alignment except at the oxbow which would be left in place to function as a low flow channel. The creek would be 50 to 70 feet wide at the top of the bank. The average depth of the creek would be about 8 to 12 feet. Five bridges along the study reach would be replaced including the Ortega Street, Cota Street, De la Vina Street, Chapala Street, and Mason Street Bridges. Economic analysis revealed that this Alternative is not economically feasible.

## 3.5 ALTERNATIVES CONSIDERED IN DETAIL AND EVALUATED FOR ENVIRONMENTAL ANALYSIS:

Section 3.4 describes the alternatives not evaluated for environmental analysis. After the AFB briefing, the decision was made to evaluate four alternatives providing 3400 cfs capacity. These alternatives differ in channel configuration due to the use of the oxbow-bypass and/or different combinations of bank protection. Bank protection consists of vertical concrete walls, a combination of vertical and stepped walls, and a combination of vertical walls and riprap. Figure 3.5.1 provides the location of the project area. Figure 3.5.2 provides the location of the oxbow and bypass culvert. The EIS/EIR evaluates environmental resources located within the project area. Mitigation measures have been developed to minimize project related impacts for each resource. The study is limited to the final 1.2 miles of the creek, between Canon Perdido Street and Cabrillo Boulevard. This study does not extend to the lagoon. Plans of all evaluated Alternatives are included in the Main Report.

Alternative No. 12 is the National Economic Development (NED) and tentatively Recommended Alternative. This alternative is also the environmentally superior plan compared to all other alternatives identified in the following paragraphs. Initially, this alternative may result in damaging slightly more biological resources, but in the future it will provide maximum biological values and quality and quantity of habitat compared to other feasible alternatives. This alternative provides incidental environmental benefits by planting native and riparian type

habitat along the riprap banks and in habitat expansion zones (see Figure 3.5.3 locations of habitat expansion zones along Lower Mission Creek). Alternative 12 provides an opportunity for construction of a wetland and habitat expansion zones. The habitat expansion zones would provide a dual benefit by expanding riparian habitat along the creek and creating passive park areas for use by area residents.

***Numbering of Alternatives is kept the same as the Main Report for consistency and comparison purposes. Alternatives are also not in a sequential order because at the AFB conference the decision was made that Alternative No. 12 is the NED and a tentatively Recommended Alternative. Therefore, a detailed project description is developed for Alternative 12 and placed prior to the other evaluated alternatives.***

### 3.5.1 Alternative No - 1: No Action.

With this alternative (future without project conditions), the existing channel and sideslope protection would remain in place. In the past, the creek banks were damaged during major flood events. During that time, the local sponsor and private property owners have constructed various types of slope protection at various locations, including: concrete or timber walls, sand bags, and grouted stone. During any major flood event, the creek banks may require maintenance and replacement. As well, periodic sediment removal by Santa Barbara County would continue to be required to maintain channel capacity. This existing channel ranges from 30 to 50 feet wide, except channel top width is wider between the State Street and Cabrillo Boulevard Bridges. The average depth of the creek is about 8 to 12 feet. The capacity of the channel is about 1050 cfs, about a 5-year level of flood protection.

### 3.5.2 Alternative No. 12: 3400 cfs Capacity, With Oxbow Bypass, Stabilized Sides Using Predominantly A Combination of Riprap Slopes Above Short Vertical Walls (NED/Tentatively Recommended Alternative-The Project Description).

Alternative 12 is the National Economic Development (NED) Alternative, as well as the tentatively Recommended Alternative. This Alternative would provide maximum incidental environmental benefits, and it is an environmentally superior plan compared to other viable alternatives considered during the feasibility study.

Alternative No. 12 consists of: improvements of the channel for approximately the last mile of the creek between the Canon Perdido Street Bridge at the upstream end and the Cabrillo Boulevard Bridge near the outlet; replacement of four bridges, streamlining bedslope, installing a

culvert that bypasses the oxbow, stabilizing creek banks using vertical walls and riprap sideslope; and planting of native vegetation along the riprap (Figure 3.5.4 of the EIS/EIR, detailed plan provided in the main report). The creek width would range from 60 to 70 feet wide at the top. The specific width of the channel at each bridge crossing is listed in Chapter 4, Plan Formulation, of the Main Report. The average depth of the creek would be 8 to 12 feet throughout the project reach. Future maintenance for the life of the project is included in this project description. Future maintenance of the constructed channel is essential to retain the form and design capacity of the creek. Impacts related to future maintenance are addressed in this document. A more detailed description of future maintenance is included in Section 3.5.3. Chapters 6 through 19 describe existing conditions and address impacts related to this proposed project. Environmental commitments and mitigation measures are included to avoid/reduce or minimize impacts to natural and cultural resources.

This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of flood protection. The natural bottom would be maintained and creek banks would consist of a combination vertical wall and ungrouted riprap. The bottom half of the bank would consist of a vertical wall while the upper half would be built with riprap at a 1.5:1 (H:V) slope. Aesthetic treatment would be incorporated into the project design to minimize the visual impacts of vertical walls. The riprap would be covered with topsoil. Concrete pipes of varying sizes (up to a maximum of three feet in diameter) would be strategically placed in between the riprap to allow planting of native trees and vegetation. Native willows or branches and other native herbaceous plants would be planted beneath the riprap and would sprout through gaps in it to form continuous understory riparian growth.

Upstream of Highway 101, the combination of vertical wall and riprap would be the predominant bank treatment, except in two short reaches just upstream of the Haley-De la Vina and De la Guerra Bridges. Below Highway 101, the combination of vertical wall and riprap would be applied along the southeast bank, starting from midway between the Chapala and Mason Street Bridges to the State Street Bridge. Vertical walls would be maintained for the remainder of this reach.

The improved creek would generally follow the existing alignment and would incorporate a new culvert between Highway 101 and the Chapala Street Bridge that would carry high flows and bypass the oxbow. The oxbow would be left in place to function as the low flow channel.

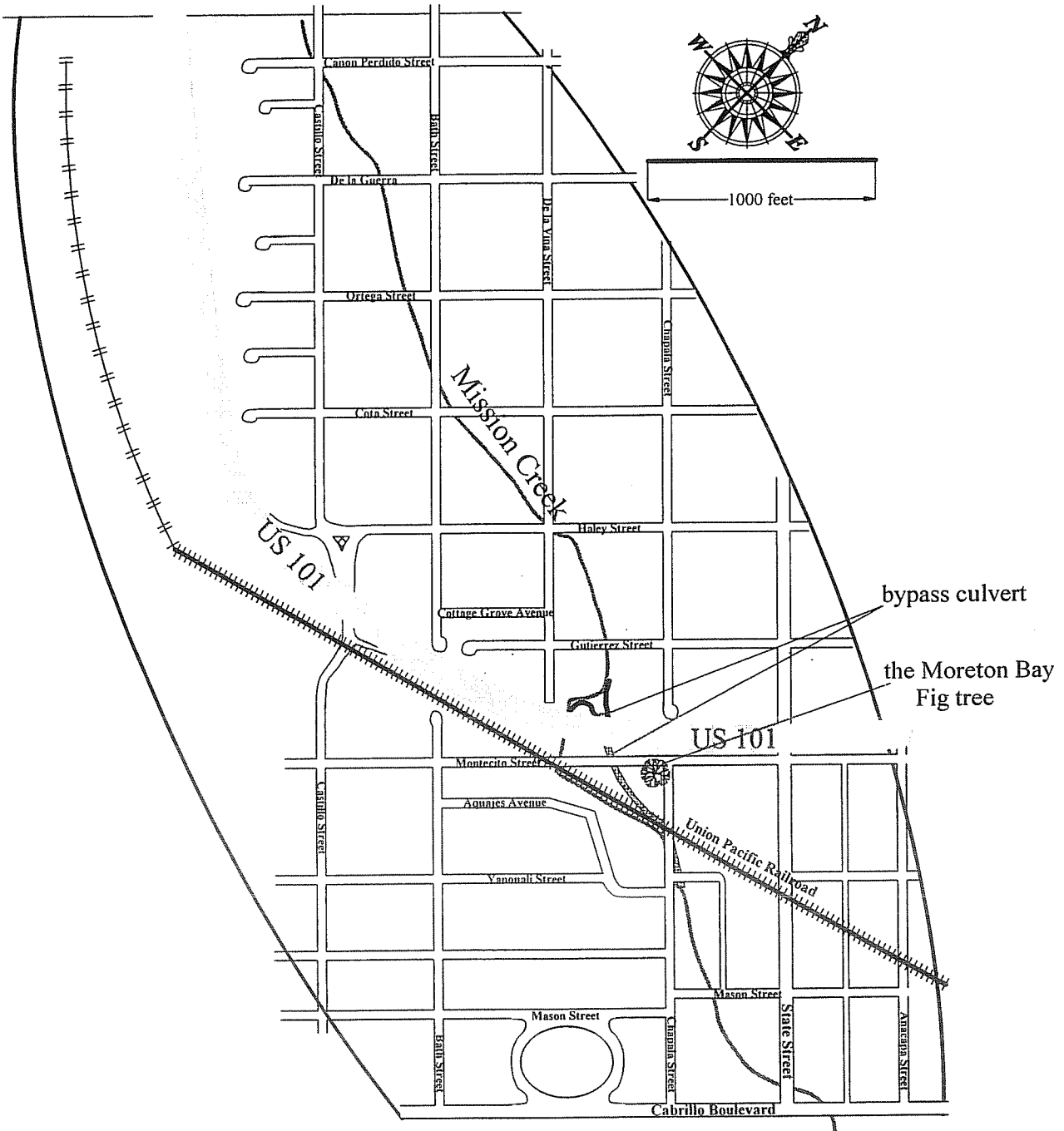



Figure 3.5.1-1: Lower Mission Creek and general features associated with the proposed project.

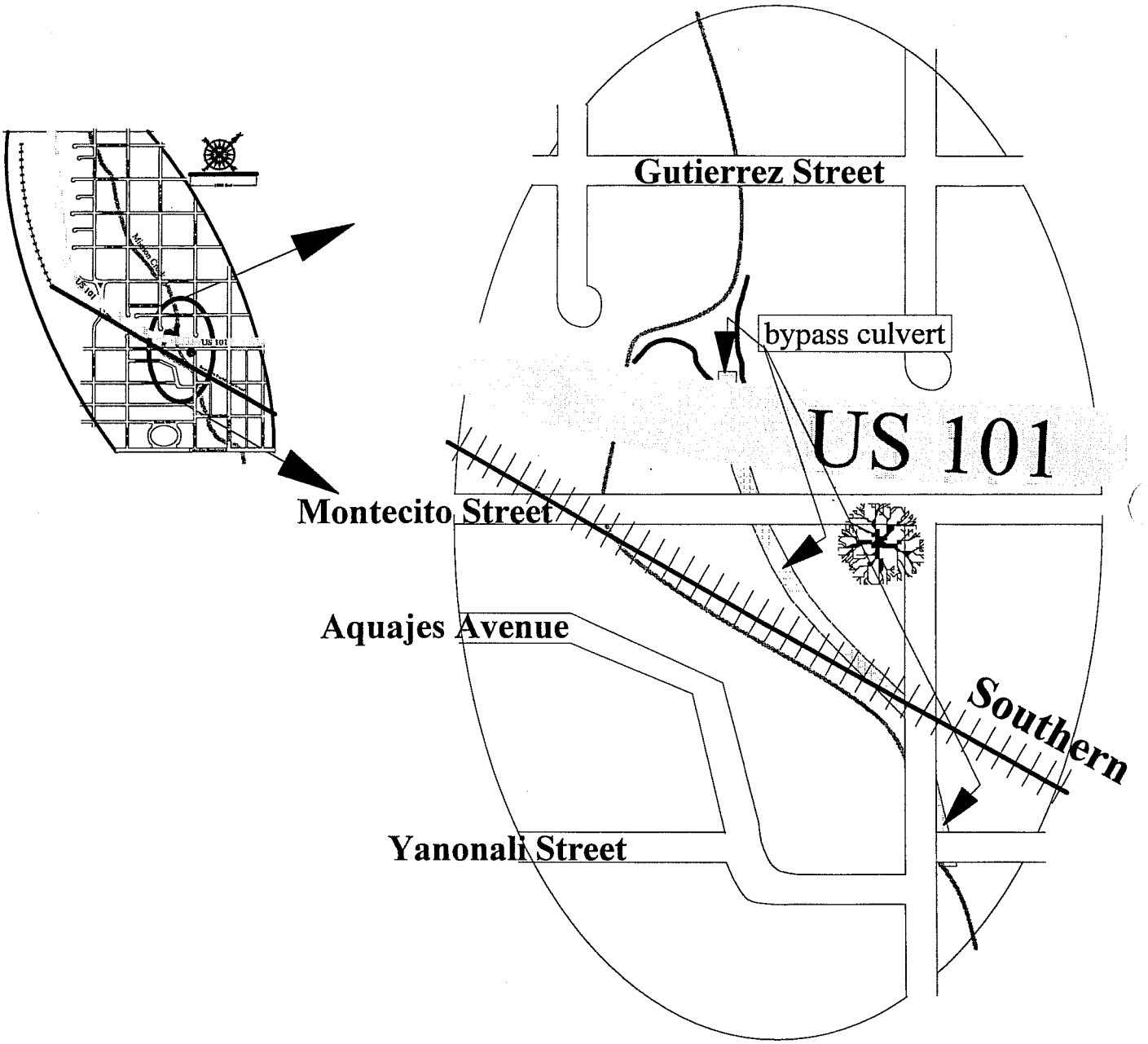



Figure 3.5.2-2: Location of the oxbow bypass culvert

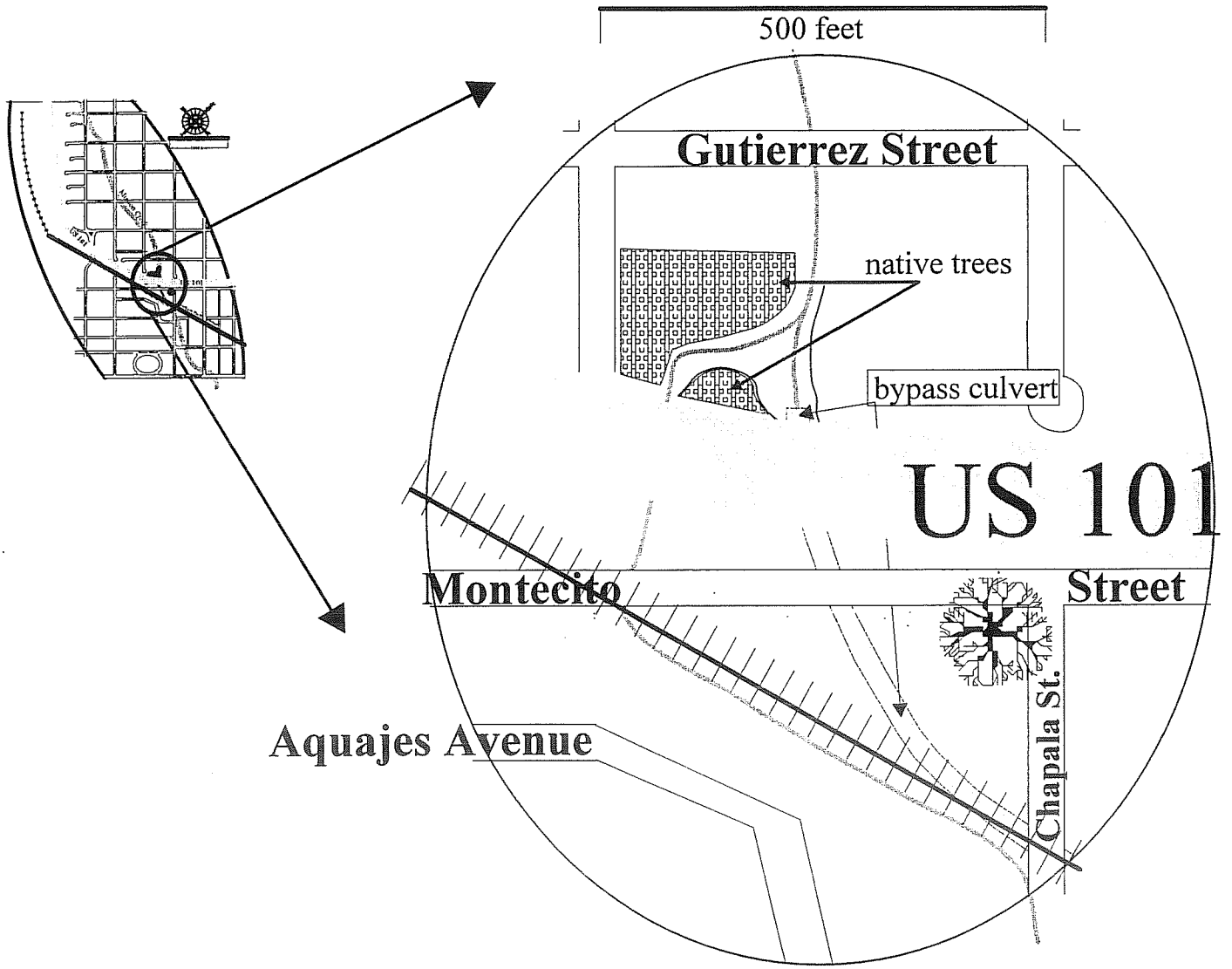



Figure 3.5.2-3: Location of possible future habitat expansion zone in the upper part of the oxbow.

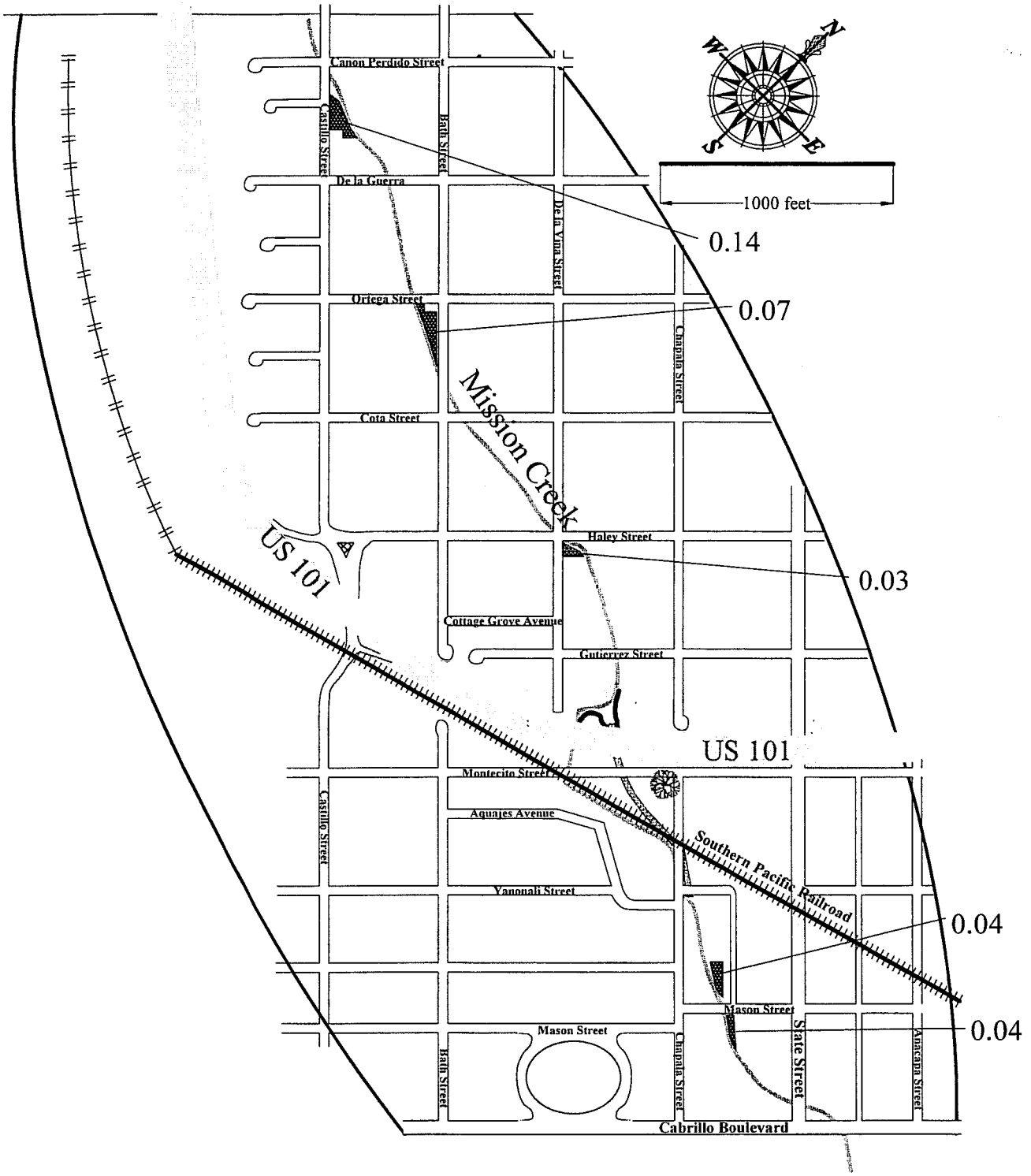



Figure 3.5.2-4. Locations of habitat expansion zones. Shapes of each and size in acres are approximate.

R Five small parcels of open land would be available along the banks after completion of project construction. These parcels range in size between 0.03 and 0.14 acres (Fig. 3.5.4). Final calculations for the Chanel's configuration will determine the size and location of all five of these parcels. These open land parcels would be designed to serve a dual purpose: to expand the corridor of riparian habitat to be planted along the stream banks, and to provide passive park space for area residents. Native trees, primarily western sycamores, cottonwoods, and coast live oak, from local stock would be planted in the habitat expansion zones. In time, their canopies would form dense clusters on the overbank and adjacent to the stream corridor (Fig. 3.5.5). In some of these zones, pathways and benches might also be added to create passive park spaces.

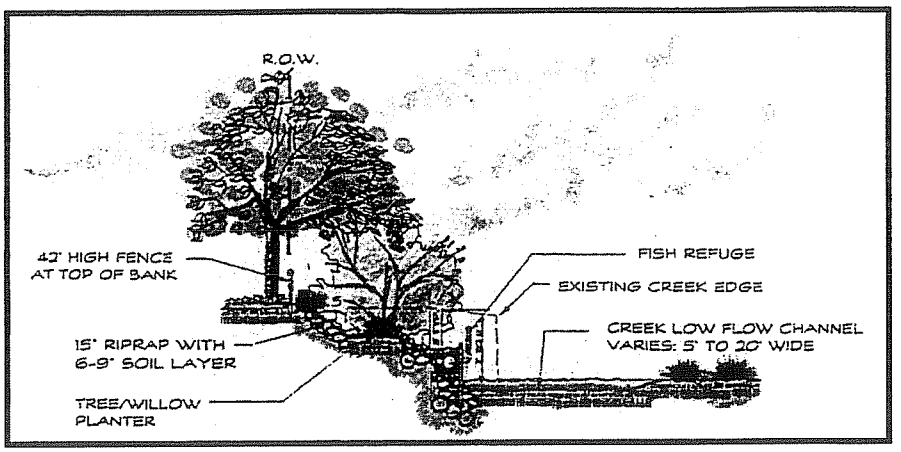



**Figure 3.5.2-5 Representative Cross Section of a Habitat Expansion Area**

Planting along the riprap and planting of native trees in habitat expansion zones are an integral part of the project design. The ecological values generated by these features would offset impacts from the implementation of the proposed alternative on existing streambank vegetation. Therefore, no additional mitigation for effects to bank habitat would be required. This proposed alternative would provide maximum habitat values compared to all other alternatives evaluated in this document. In the long-term, the habitat value within the project reach would exceed the value of the existing habitat.

If any of the planting on the aforementioned features is deleted from the project design, then impacts related to the biological resources would need to be recalculated, which could result in additional mitigation.

R This alternative would also provide the opportunity to construct another habitat expansion zone in the vicinity of the oxbow formation area. This habitat expansion zone would be located just upstream of Highway 101. It would be located in the vicinity of De la Vina Street on the west and Gutierrez Street on the north. The total area to be created would be about 0.6 acres (25,800 square feet, see Figure 3.5.3 for location). This area was originally proposed as a constructed wetland. However, after further review, it was determined that this site is more suitable for use as a habitat expansion zone, as decried above. The construction of this feature would provide additional ecological benefits. However, its construction would be subject to cleanup of the existing known contamination on the site (see details in Section 15, HTRW of the EIS/EIR). If, prior to the completion of project construction, the designated site is remediated, then the habitat expansion zone would be constructed as planned.

Four bridges along the study reach would be replaced including the Ortega Street, Cota Street, De la Vina Street, and Mason Street Bridges.

### 3.5.2.1 Detailed Project Description of Each Feature Associated with the Tentative Recommended Plan:

R The project description and future maintenance have been revised based on hydraulic/engineering, and real estate constraints and comments received from the resource agencies, and to include structural features to mitigate or minimize impacts to the biological resources, particularly to the Federally listed species, steelhead and gobies. Future maintenance of the constructed channel and culvert and weir length and height has been modified based on additional Hydraulic Analysis performed for the Recommended Plan.

**Removal of Existing Bank Protection and Earthen Material:**

The creek bottom and banks for about a mile, between the Canon Perdido Street and Cabrillo Boulevard Bridges, would be excavated to increase the creek capacity to provide a 20-year level of flood protection to the City of Santa Barbara. The removal of all existing banks would occur within the project reach except for a retaining wall located just upstream of De la Guerra Bridge, and both banks along the oxbow between Highway 101 and the Chapala Street Bridge. The excavation of the channel would begin from the downstream end of the project near Cabrillo Boulevard and progress upstream.

R The total amount of material to be excavated from creek banks and creek bottom would be about 82,000 cubic yards (cy). Creek excavation would occur section by section. Therefore, all 82,000 cy of material would not be stockpiled at one time. About 17,000 to 18,000 cy of material would be utilized in project construction as fill material. The remaining 64,000 cy of

excavated material can be stockpiled or be taken to a county yard for storage or recycling depending on whether it meets project specifications. Expected debris would include stacked burlap bags filled with concrete, large rocks, mortared riprap, slabs of concrete, grouted stone, jointed masonry walls, shot-crete walls, wire baskets filled with coarse rock (gabions), formed walls, wooden pilings, and other bank material found throughout the length of the project. The material could be distributed to other construction sites requiring fill. All of the sandstone not used in project construction will either be conserved for use in other City projects or, if badly damaged, recycled. Most of the metal and concrete can be recycled. The green waste can be composed and recycled as compost and mulch. The USACOE will examine suitability of the excavated material for beach nourishment. If material is suitable, it can be used to restore sand supply on local beaches.

It is assumed that very small amounts of excess material would be transported within a radius of about 10 to 25 miles from the project site. At maximum, about 30,000 to 40,000 cy of material would need to be transported to the disposal sites either at the Tajiguas Landfill, located 25 miles west of the project site or used in a reclamation site (if one exists at the time of construction). About 1,500 to 2,000 truck trips would be required to transport the excavated material. Channel excavation may last for about 130 to 180 days; however, excavation and construction activities, including bank stabilization and construction of bridges etc., would be accomplished at the same time. The construction would be performed in segments. Therefore, the estimated time frame for project construction is about two years. In case of inclement weather conditions, mechanical failure, funding constraints, or environmental reasons, project construction may be prolonged for three to four years. It is expected that about 150 to 600 cy of material would be removed each day. Therefore, it is assumed that about 5 to 15 truck trips would be required per day to transport excavated material to the staging or stockpile area.

**Stabilization of Creek Banks**:

The existing creek banks would either be replaced with the combination short walls and riprap sideslopes or vertical walls. The vertical walls would be constructed in two methods, according to their proximity to any existing structures. The first method would be the use of an inverted "T" footing. This less expensive construction method would be applied in areas where sufficient rights–of-way are available without directly impacting existing structures. In areas with limited rights-of-way and close proximity to structures, a pier footing construction design would be applied. Typical cross sections of these designs are shown in the Plates found at the end of the Main Report, and Figure 3.5.2.1-1, 3.5.2.1-2 of the EIS/EIR.

Where the riprap-vertical wall is used, the height of the wall would be approximately half the depth of the creek. The riprap sideslope would be built at a 1.5:1.0 (H:V) slope. Concrete pipes of varying sizes, placed vertically in between the riprap, would serve as openings for planting of native riparian vegetation. The riprap sideslope would be covered with topsoil and

planted with ground cover and shrubs that would help develop the understory of the larger riparian canopy along the creek.

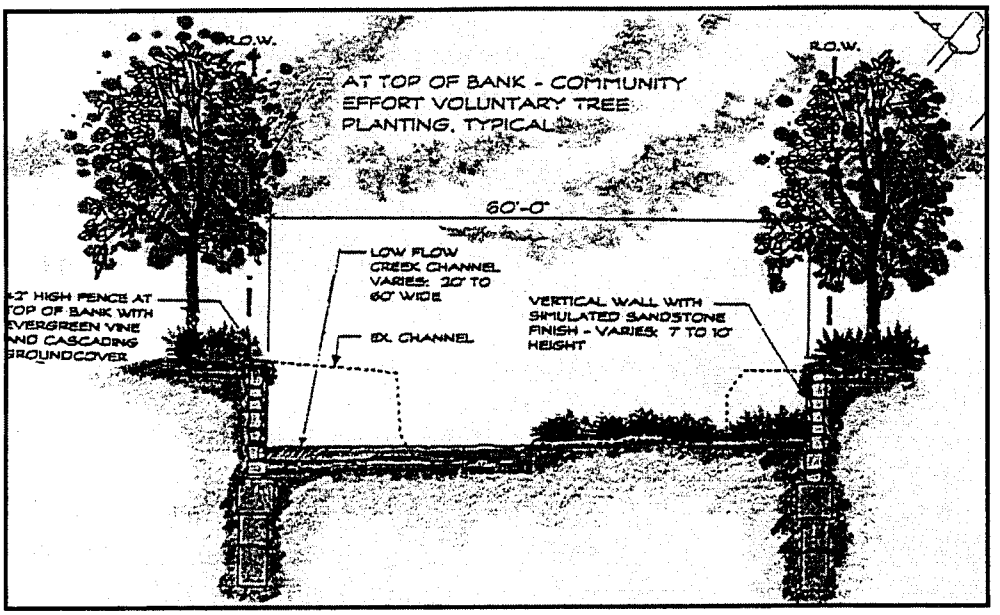



**Figure 3.5.2.1-1 - Vertical Wall on Pier Footing Representative Cross Section**

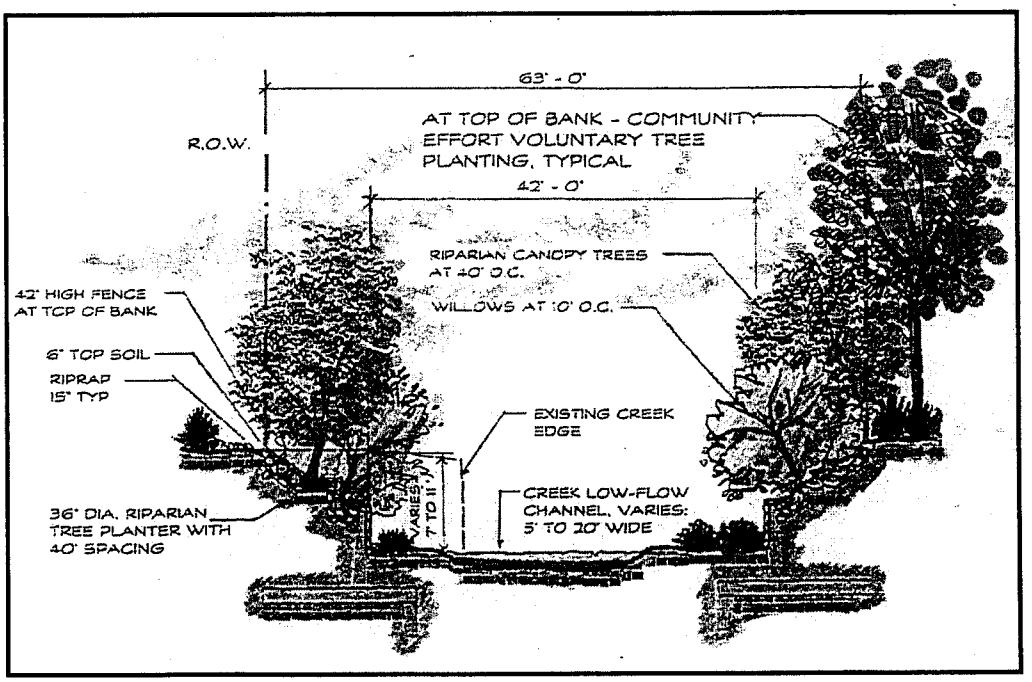



**Figure 3.5.2.1-2 - Vegetated Riprap Sideslope on Inverted "T" Footing Representative Cross Section**

**Removal and Replacement of Bridges:**

Lower Mission Creek is spanned by twelve bridges before emptying into the Pacific Ocean. Four of those bridges would need to be replaced including Ortega Street, Cota Street, De la Vina Street, and Mason Street Bridges. The De la Vina Street Bridge will be replaced by the city prior to implementation of this project. It is expected that the sequence of the remaining bridge demolition and reconstruction would complement the creek improvement construction schedule. Construction of the bridge replacements at the road crossings would need to be phased so that an adjacent road crossing could be used as a detour. Bridge reconstruction would start with the most downstream bridge (Mason State Bridge) and progress sequentially in the upstream direction ahead of the creek improvements. This would enable flood control benefits to be realized for the area downstream of the improved creek during the construction phase.

R **Weir Inlet and Culvert that Bypasses the Oxbow :**

The reach referred to, as the "oxbow" is where the sharpest bends of the creek within the project area are found. The oxbow runs the length of the creek between the Gutierrez and the Chapala Street Bridges, where the creek makes several sharp turns, while crossing Highway 101, the Montecito Street Bridge, and Union Pacific Railroad before joining its most direct path to the Pacific Ocean (See Figure 3.5.2.1-3). The culvert (two 15-foot wide by 6-foot high boxes) connecting both ends of the oxbow is referred to as the overflow culvert or the "oxbow bypass". The overflow culvert would follow a more direct path across the oxbow. It would begin upstream of Highway 101, pass under the highway (where CalTrans had built a span to accommodate such a crossing to eliminate impacts to highway traffic), Montecito Street, and the railroad tracks before rejoining the creek alongside the downstream end of Chapala Street Bridge (See Figure 3.5.2.1-3).

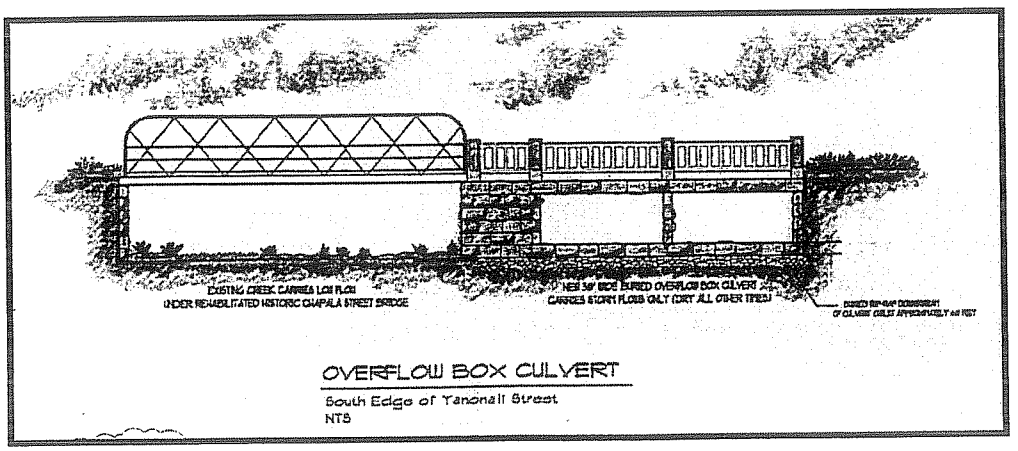



**Figure 3.5.2.1-3 - Outlet of Overflow Culvert Alongside Chapala Street Bridge**

The culvert alignment would be far outside the Moreton Bay Fig tree dripline to minimize impacts to its major root system. The culvert would not be covered across Highway 101. However, it would be covered across Montecito Street to its confluence at the downstream end of the Chapala Street Bridge.

A weir structure (see Figure 3.5.2.1-4) would be built at the inlet of the culvert to control the flows through the culvert and the oxbow. The height of the weir would be set in order to direct lower flows of up to 640 cfs through the oxbow. Also, the weir would split higher flows (up to the design conveyance capacity of 3400cfs) between the culvert and the oxbow.

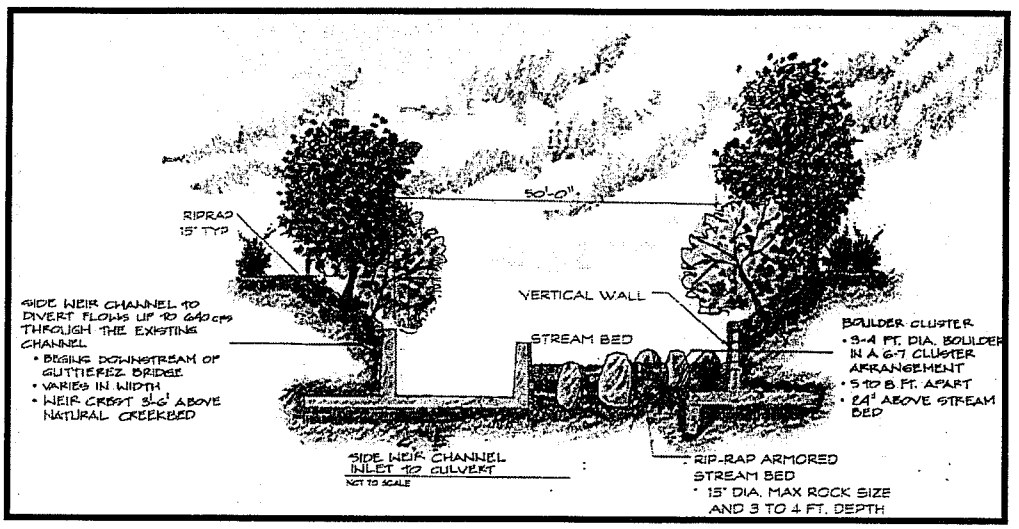



**Figure 3.5.2.1-4 - Representative Cross Section of Side Weir Channel Inlet to Overflow Culvert (Looking Downstream).**

The culvert divider would be designed to form a "bullnose" and help minimize the potential of debris blockage. Refer to Exhibits in the Main Report for the details of these design elements.

## Reach by Reach Project Description:

The detailed improvements described in the following sections are segmented between successive bridge crossings. For orientation, the left and right banks are described while facing downstream (right would be towards the west and left towards the east). The creek generally flows southeasterly as it heads towards the Pacific Ocean. Reference station markings to Exhibit 3, Sheets 1 to 4 of the Main Report.

*Canon Perdido Street Bridge to De la Guerra Street Bridge (Station 61+36 to 57+00):*

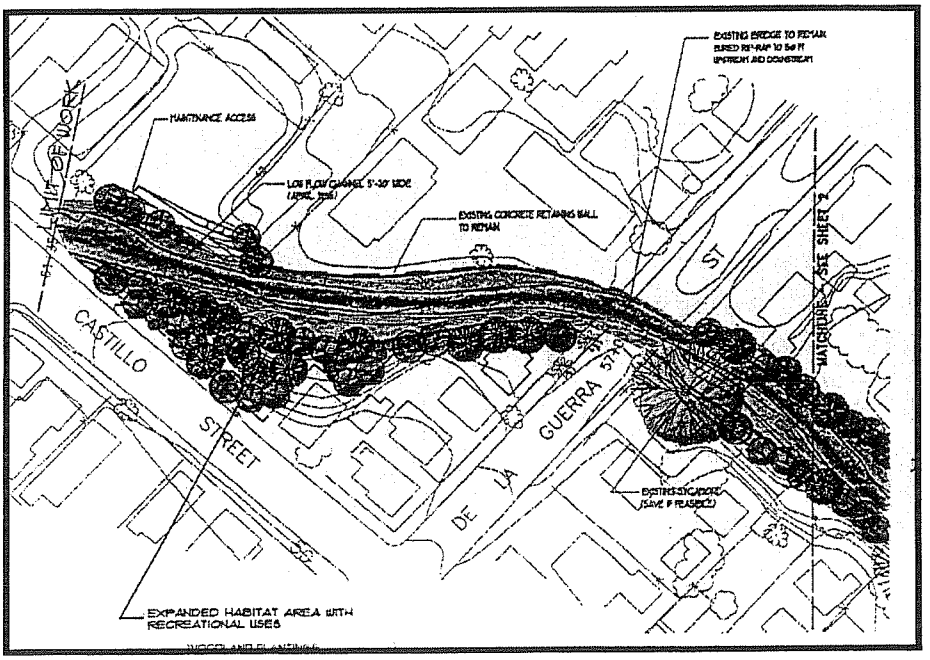



**Figure 3.5.2.1-5 - Canon Perdido and De La Guerra Street Bridges (Upstream End of the Project)**

Canon Perdido Street Bridge marks the upstream boundary of the project. Immediately upstream of this bridge is an existing channelized portion of the creek, which conveys flows at high velocities into the project area. Between Canon Perdido Street and De la Guerra Street, the creek would be 63 feet wide at the top of bank with an average depth of 7.5 feet. The right bank would mostly consist of the toe wall and riprap sideslope, except for the section just upstream of De la Guerra Street Bridge, where vertical wall would be used. The left bank would maintain the existing retaining wall along the last two-thirds of its length; the upstream remainder of the left bank would consist of vertical wall-riprap sideslope. A maintenance access ramp would be incorporated on the left bank. A habitat expansion area would be created on the creek terrace along Castillo Street. The creek bed along this reach would be armored with riprap and boulder clusters to act as energy dissipaters.

***De la Guerra Street Bridge to Ortega Street Bridge (Station 57+00 to 52+30):***

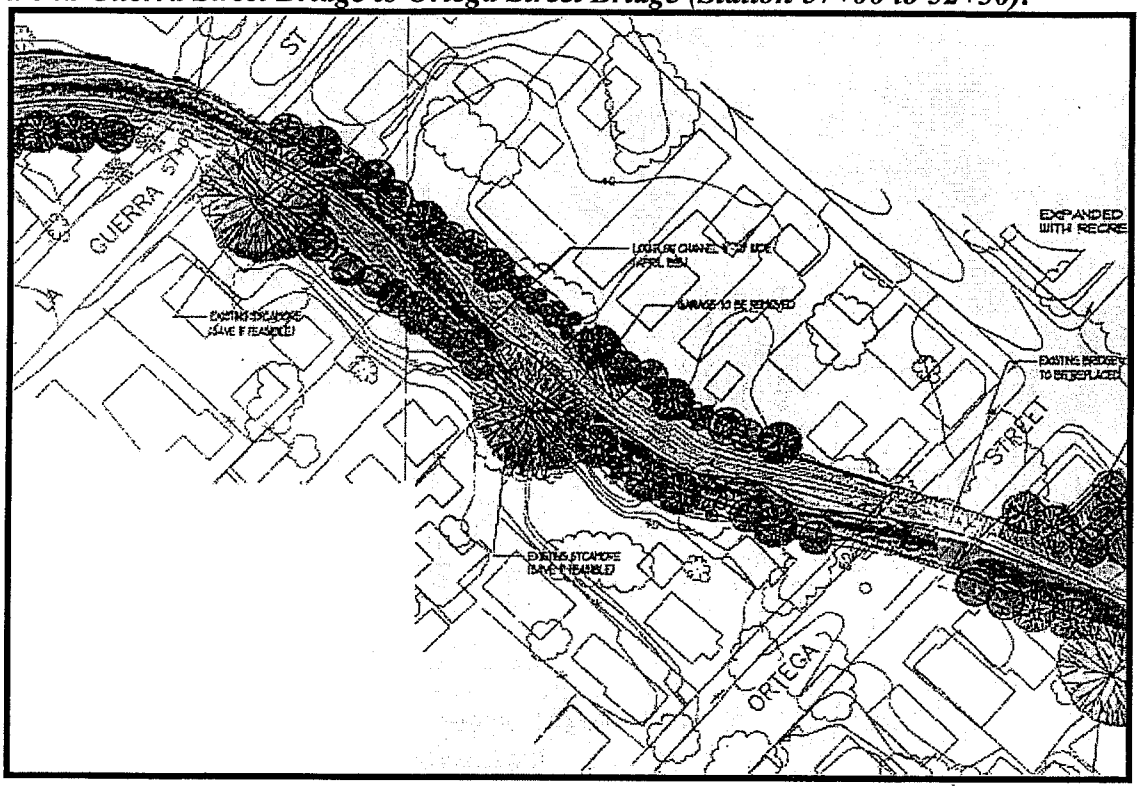



**Figure 3.5.2.1-6 - De La Guerra Street Bridge to Ortega Street Bridge**

The creek would be 63 feet wide at the top of bank along this reach with both banks consisting of toe wall and riprap sideslope, except for a short reach on the left side immediately upstream of the Ortega Street Bridge where full height vertical walls would be used to avoid impacting a culturally significant structure. This reach would have an average depth of 9 feet. The invert slope would be streamlined, necessitating excavation and removal of one to four feet of streambed. Approximately 150 feet of streambed immediately upstream and another 150 feet immediately downstream of the De la Guerra Street Bridge would be a parking structure located along the left bank at station 54+00 would be removed to accommodate the required wider channel. The Ortega Street Bridge would be rebuilt and sized to accommodate the higher-than-existing design flow.

***Ortega Street Bridge to Bath Street Bridge (Station 52+30 to 49+00):***

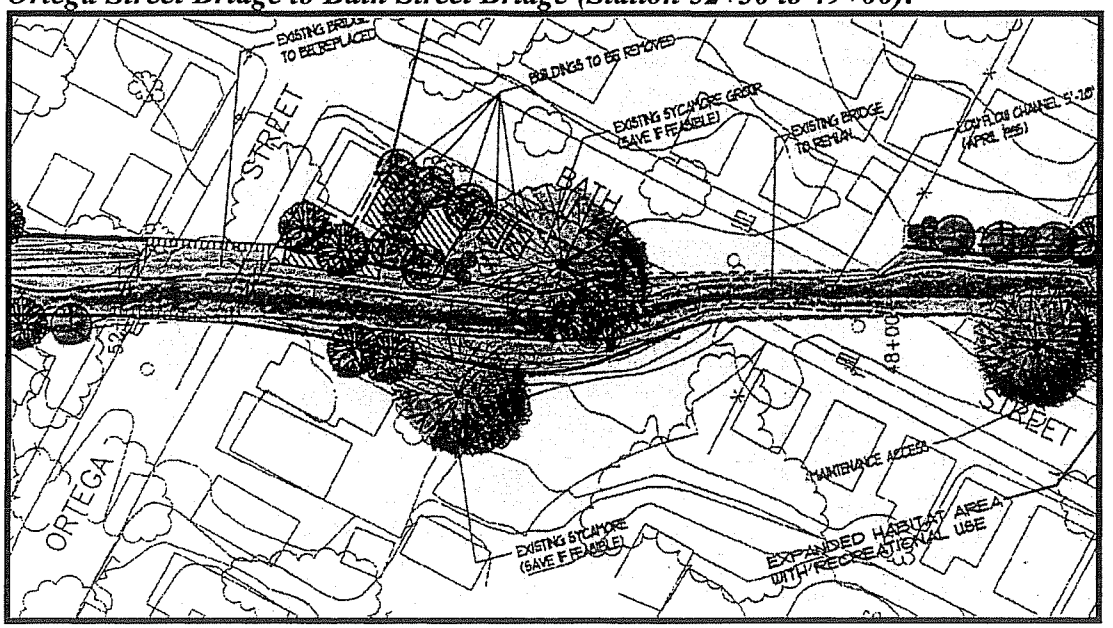



**Figure 3.5.2.1-7 - Ortega Street Bridge to Bath Street Bridge**

The creek would be 63 feet wide at top of bank along this reach with both banks consisting of vertical wall-riprap sideslope averaging 9 feet in depth. The invert slope would be streamlined, necessitating excavation and removal of one to three feet of streambed. Three residential properties and two garage structures located along the left bank would be removed to allow for creek widening. The only structure that would remain on the left side is located at the corner of Bath and Ortega Streets. The Bath Street Bridge would remain in place and would convey the design flow. The remnants of the acquired properties would be planted with native trees and vegetation, thus creating a habitat expansion zone and, possibly, a passive park space.

***Bath Street Bridge to Cota Street Bridge (Station 49+00 to 46+00):***

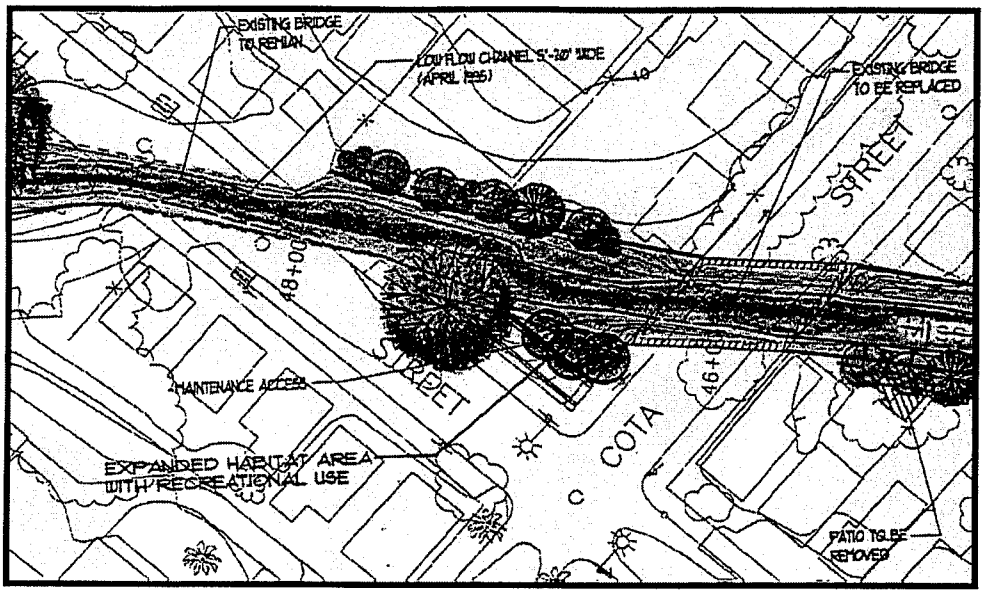



**Figure 3.5.2.1-8 - Bath Street Bridge to Cota Street Bridge**

This short reach occupies the northeast corner of Cota Street and Bath Street intersection. The creek would be widened to 63 feet at the top of bank. The left bank would be protected with a vertical wall. On the right side, the existing maintenance access ramp fronting Cota Street would be kept in place. Cota Bridge would be rebuilt and sized to accommodate the higher-than-existing design flow.

*Cota Street Bridge to Haley-De la Vina Bridge (Station 46+00 to 39+00):*

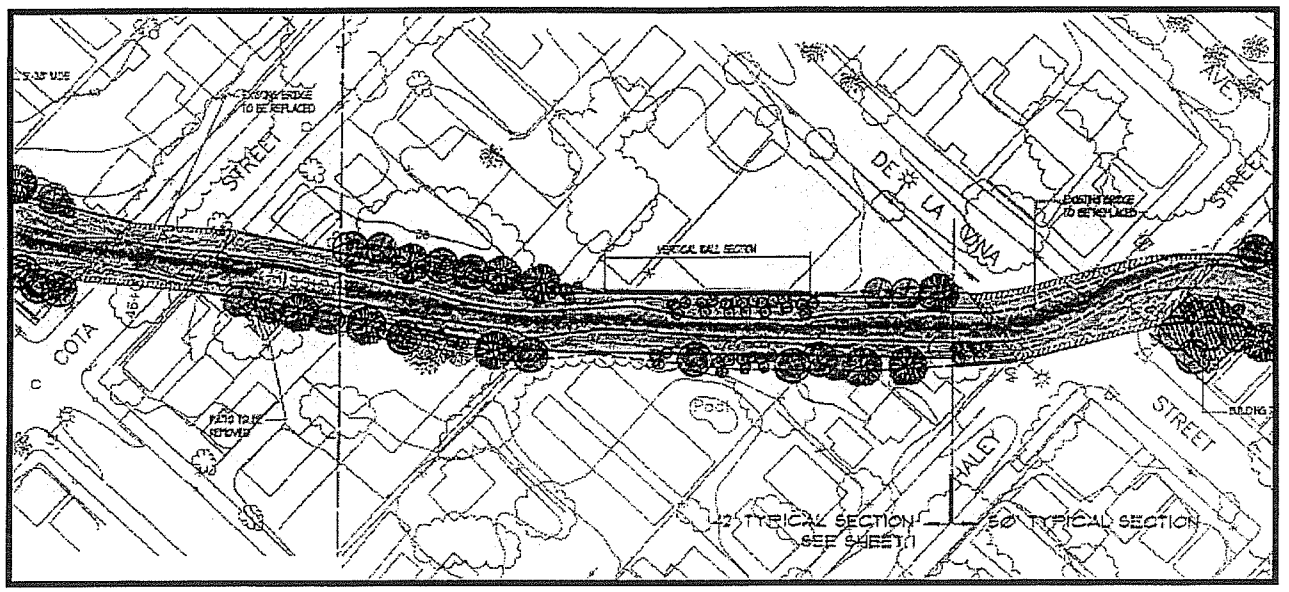



**Figure 3.5.2.1-9 - Cota Street Bridge to Haley-De la Vina Bridge**

The upper half of this reach (Cota Street Bridge to Station 43+00) would be 63 feet wide at the top of bank with both sides consisting of vertical wall-riprap sideslope, except for a short reach immediately downstream of the Cota Street Bridge where vertical walls would be used to preserve a culturally significant structure. On the downstream half of the left side, the bank protection would transition from a toe wall-riprap sideslope into a vertical wall across the multi purpose property (Apartment and Hardware store) located between Station 43+30 and 41+70, where the top width would narrow to 55 feet. The invert slope would be streamlined, necessitating excavation and removal of two to three feet of the streambed. This reach would have an average depth of 9 feet. A patio deck located at 532 Bath Street would be removed to allow for creek widening. The Haley-De la Vina Street Bridge would be rebuilt and sized to accommodate the higher-than-existing design flow.

*Haley-De la Vina Bridge to Gutierrez Street Bridge (Station 39+00 to 34+00):*

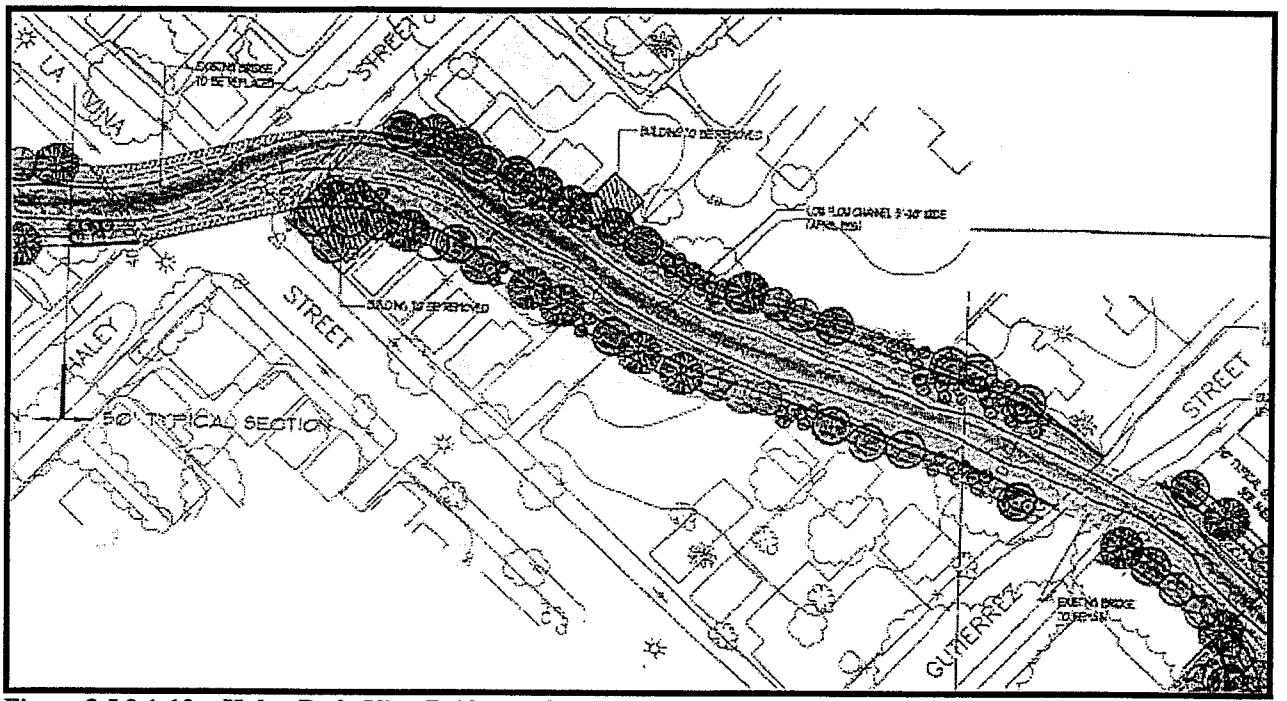



**Figure 3.5.2.1-10 - Haley-De la Vina Bridge to Gutierrez Street Bridge**

The creek would be 71 feet wide at the top of bank along this reach with both banks consisting of the toe wall-riprap sideslope, except for a short reach on the east side immediately upstream of the Gutierrez Street Bridge, where a vertical wall would establish a transition from the east bank into the bridge. The reach would have an average channel depth of 9 feet. The invert slope would be streamlined, necessitating excavation and removal of two to four feet of streambed. Two residential properties located at 434 De la Vina Street and at 119 West Haley Street (Parcel Number 037-203-02) would be removed to allow for creek widening. The remnants of the 434 De la Vina Street property would be planted with native trees and vegetation, thus creating a habitat expansion zone and, possibly, a passive park space. Approximately 150 feet of streambed immediately upstream the Gutierrez Street Bridge would be armored with riprap and a cluster of boulders to act as energy dissipaters.

***Gutierrez Street Bridge to Highway 101:***

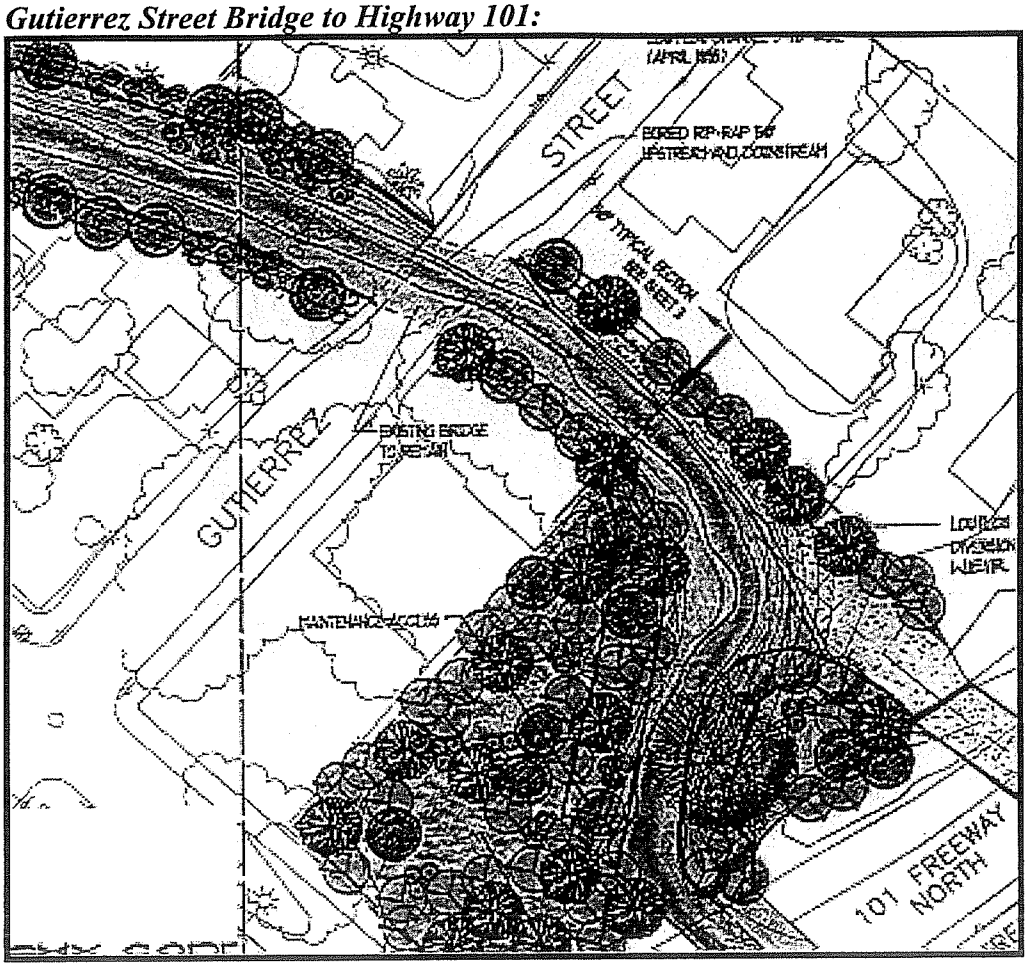



**Figure 3.5.2.1-11 - Gutierrez Street Bridge to Highway 101**

The reach from Gutierrez Bridge to Station 32+50 (beginning of CalTrans property) would continue to be 71 feet wide at the top of bank with banks consisting of the toe wall-riprap sideslope. A low flow diversion weir would run along the left side and connect to the overflow culvert near the upstream face of Highway 101. The depth of the creek along this reach would average about 9 feet. The toe wall-riprap sideslope on the right bank would terminate just inside the CalTrans property line, about 120 feet downstream of the Gutierrez Street Bridge. The remaining section of the right bank would be protected entirely with riprap. Approximately 150 feet of streambed immediately upstream and downstream of the Gutierrez Street Bridge would be armored with riprap and a cluster of boulders to act as energy dissipaters.

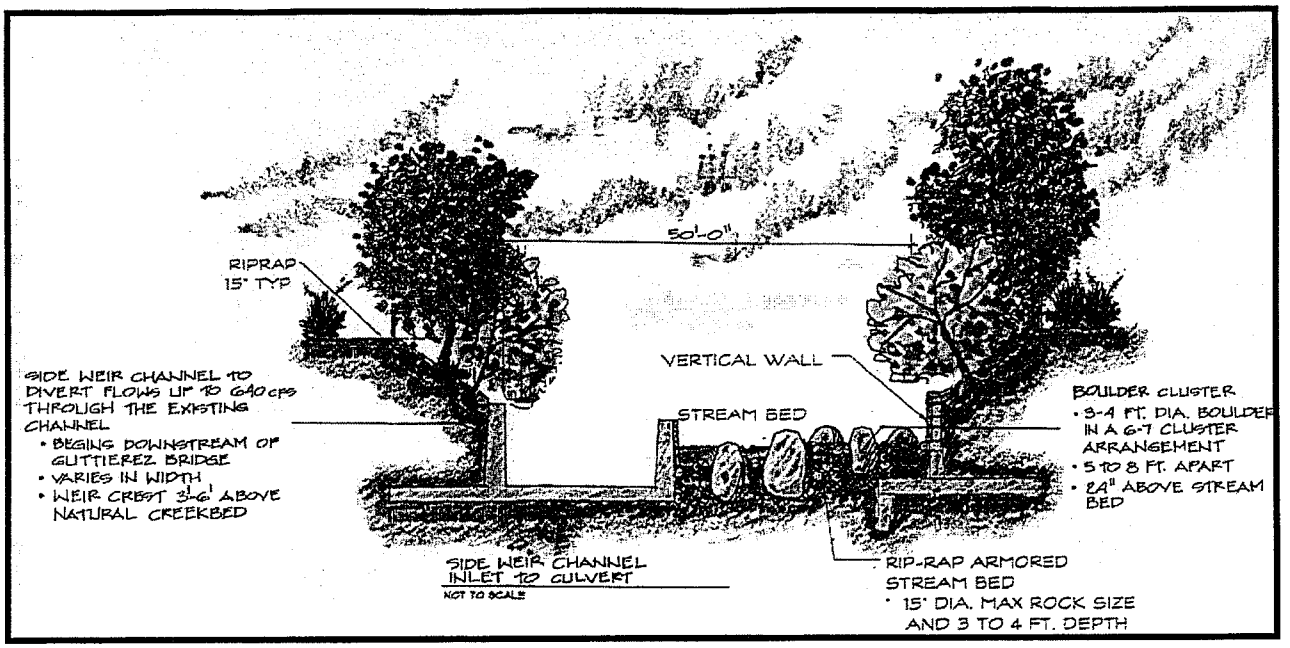



**Figure 3.5.2.1-12 - Representative Cross Section of the Side Weir Channel Inlet to Overflow Culvert**

The higher flows across this reach would be divided between the existing channel (oxbow) and the overflow culvert. The oxbow would continue to convey the base flow and low-discharge events up to 640 cfs (equivalent to an event with 2.3-year return interval). During larger events, the new culvert would be expected to carry two-thirds of the design capacity, while the remaining third would be conveyed by the oxbow. No modifications would be needed for the oxbow between Highway 101 and the Chapala Street Bridge.

*New Overflow Culvert that Bypasses the Oxbow between Highway 101 and Chapala Street Bridge:*

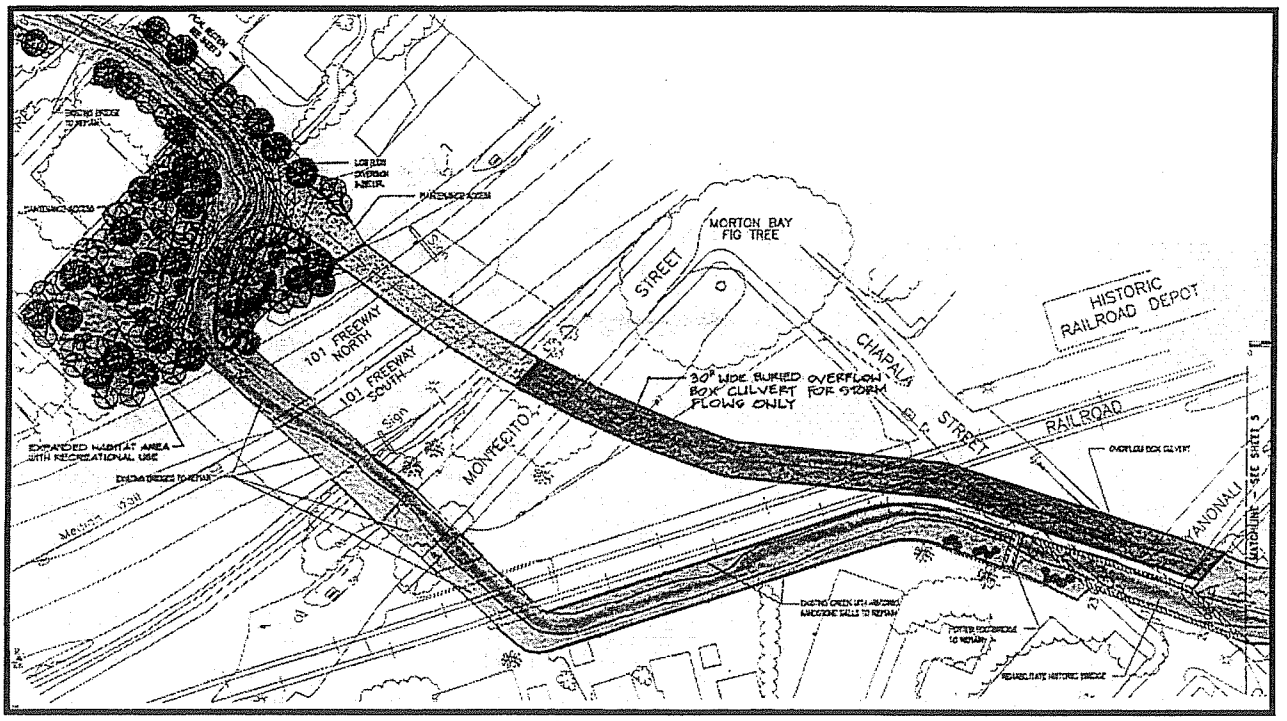



**Figure 3.5.2.1-13 - New Overflow Culvert that Bypasses the Oxbow between Highway 101 and Chapala Street Bridge**

Across the existing opening underneath Highway 101 (built by Caltrans in the 1980s), the new culvert would be a pair of 15 foot wide by 6 foot high open channels. Below Highway 101, the culvert would be covered before it crosses Montecito Street and until it terminates alongside the downstream end of the Chapala Street Bridge. The open channel would be approximately 200 lineal feet while the covered section would be approximately 640 lineal feet. The covered portion of the culvert would cross under the Amtrak passenger platform before crossing under the railroad tracks. The box would remain covered as it runs along the left side of the sandstone channel. It would continue alongside the Chapala Street Bridge and terminate at the downstream end of the bridge. Approximately 50 feet of streambed immediately downstream of the overflow culvert outlet would be armored with riprap to present scorning of the bottom. In order to avoid any potential impacts to the Moreton Bay Fig tree, the culvert is aligned approximately 50 feet outside of its dripline.

*Chapala/Yanonali Street Bridge to Mason Street Bridge (Station 25+00 to 17+00):*

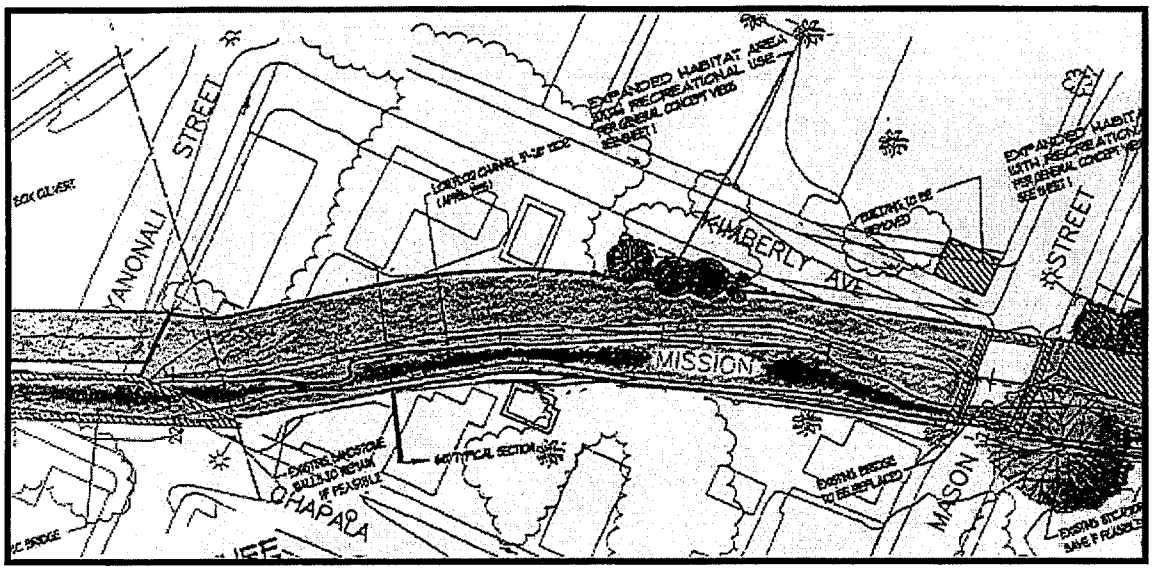



**Figure 3.5.2.1-14 - Chapala/Yanonali Street Bridge to Mason Street Bridge**

The creek banks would be predominantly vertical walls on both sides, except for approximately 120 lineal feet of the left (east) bank just upstream of the Mason Street Bridge. This portion would be protected by the toe wall-riprap sideslope. The riprap slope will be laid back to cover the entire parcel and create an expanded habitat zone. The creek would be 60 feet wide between the vertical wall sides and 71 feet wide at the top of bank where the toe wall-riprap sideslope is used. This reach would have an average depth of 7.5 feet. The invert slope would be streamlined, necessitating excavation and fill of about one foot of streambed. The Mason Street Bridge would be rebuilt and sized to accommodate the higher-than-existing design flow. In order to widen the creek and rebuild the bridge, Kimberly Avenue would be partially realigned, which requires the removal of the commercial structure (APN 033-075-006) located at the corner of Kimberly Avenue and Mason Street.

*Mason Street Bridge to State Street Bridge (Station 17+00 to 12+50):*

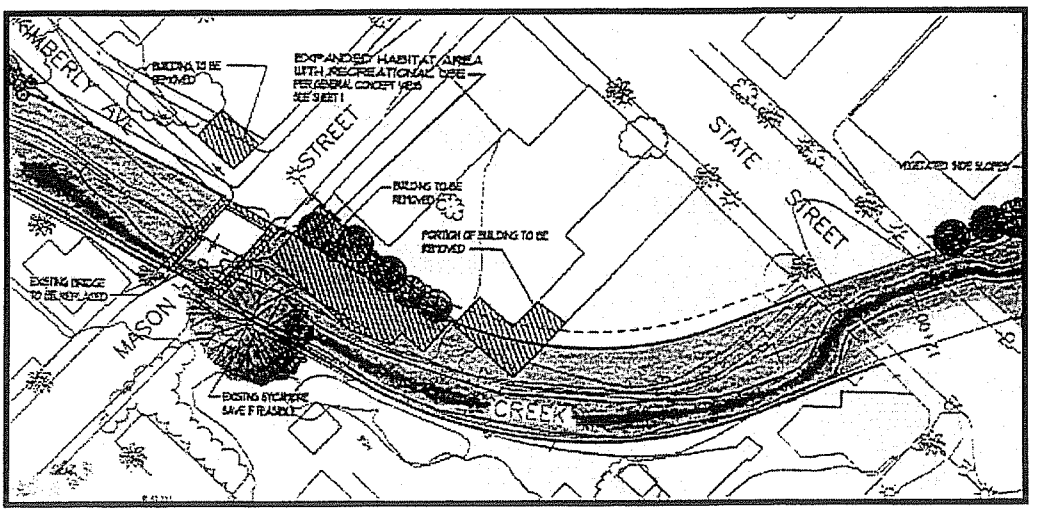



**Figure 3.5.2.1-15 - Mason Street Bridge to State Street Bridge**

The creek banks would be predominantly vertical walls between Mason and State Streets, except for the left bank immediately downstream of the Mason Street Bridge, which would consist of the toe wall-riprap sideslope. The property located at 15 W. Mason Street would be removed to allow for widening of the creek. The remainder of this lot would be planted with native trees and vegetation, thus creating a habitat expansion zone and, possibly, a passive park. Another structure located on 29 State Street would be partially removed. The remainder of this structure would continue to function as a commercial establishment. The creek would be 60 feet wide between the vertical wall sides and 71 feet wide at the top of bank where the toe wall-riprap sideslope is found. The average depth along this reach would be 8 feet. The invert slope would be streamlined, necessitating excavation or fill averaging one foot in depth. The State Street Bridge would remain to convey the 3400-cfs design capacity.

*State Street Bridge to Cabrillo Boulevard Bridge (Station 12+50 10+15):*

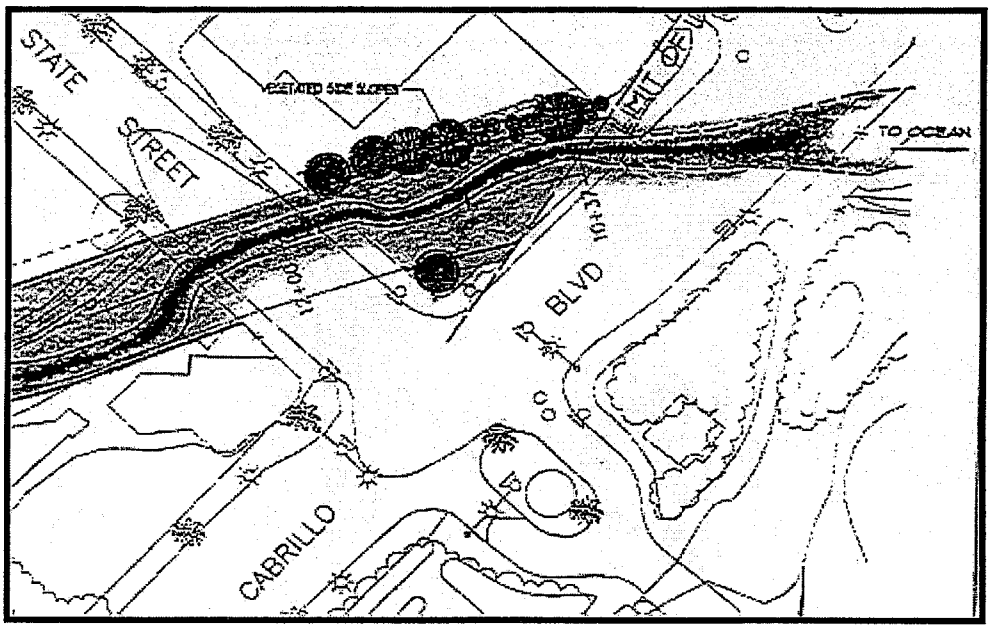



**Figure 3.5.2.1-16 - State Street Bridge to Cabrillo Boulevard Bridge**

The banks across this short span, located at the corner of State Street and Cabrillo Boulevard, would consist of the toe wall-riprap sideslope. The invert would be cleared of leftover footings from earlier structures. The creek would be widened to approximately 65 feet at the top of bank and is not expected to have any impacts on the adjacent structures. Cabrillo Boulevard Bridge would remain in place and convey the 3400-cfs design capacity. This is essentially the downstream boundary of the project and any associated construction activities. The lagoon is located immediately downstream of the Cabrillo Boulevard Bridge, a short reach before the shoreline of the Pacific Ocean.

**Pilot Channel:**

The project's design for the creek's invert includes scoring a "pilot channel" into the bottom as the last element of construction. Otherwise the streambed would be a uniformly flat expanse of native sediments between the toe walls. This pilot channel would constitute a permanent component of the instream habitat between Canon Perdido and Highway 101, although one possibly given to positional shifts as the finished creek bed evolves. No pilot channel would be fashioned into the creek bed below Yanonali Street. Between Yanonali and Mason Streets periodic tidal ebb and flow would largely negate the intended purpose of such a

channel, and below Mason Street the tidal movements would very quickly would make it thoroughly ineffective.

Initial alignment of the pilot channel would be planned in accordance with positions of fish ledges. Fish ledges would be constructed at the outside of bends of flows patterns to insure water impinging against them and thereby scouring persistent pools beneath them. Close to ledges, the pilot channel would be aimed toward them. In the reaches between ledges, the pilot channel would be scored to follow the likely path the stream would tend to establish on its own. During Preconstruction Engineering & Design (PED) a channel stability assessment study would be performed to estimate the alignment or path of a pilot Chanel.

A pilot channel large enough to carry at least 50 $ft^3$/sec would be adequate to carry water along the preferential innate course. Its physical size and shape would also be determined after final hydraulic analyses, but would probably be trapezoidal in appearance and 10 to 12 feet wide and about 1 foot deep. Such a configuration would leave ample freeboard for the low flows which typically move down Mission Creek from late spring through early winter. The channel would be enriched with representative types and gradations of the larger native substrates — coarse gravels, small cobbles, and rocks or boulders as currently exist within Mission Creek.

R **Structural Features to Mitigate and Avoid Impacts to Biological Resources:**

Several structural features would be included to avoid and mitigate impacts to biological resources. These permanent and durable mitigation features would create hiding places where fish may take refuge. They would be composed of four separate structural elements formed by coarse surface relief of the walls (goby refugia), artificial overhangs projecting from the walls (fish ledges), and placing double rows of coarse boulders (fish baffles) between the overhangs along the creek walls (See Figure 3.5.2.1-18) and rock energy dissipators. In combination, they should provide shelter for fish of all sizes.

**Rock Energy Dissipators:**

Rock energy dissipators would be located in two reaches (See Exhibit 64, Sheets 1-5 of the Main Report for locations). In areas where undesirable high velocity flows could be expected, the streambed would be armored with riprap and bolders (see Figure 3.5.22).

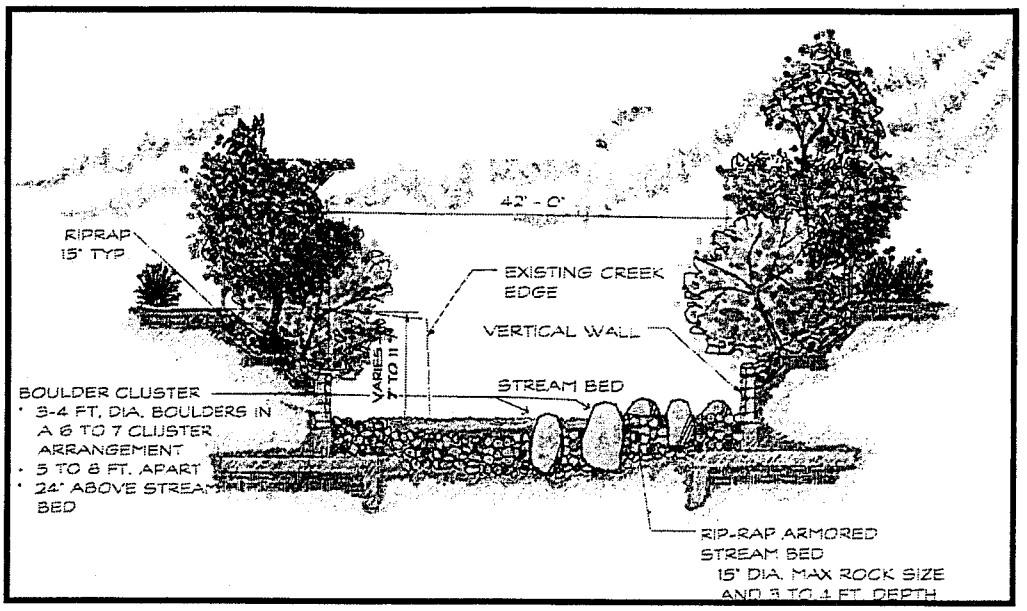



**Figure 3.5.2.1-17 - Representative Cross Section of Rocky Energy Dissipaters and Boulder Clusters**

Fields of large boulders would be embedded into the bottom at these two locations. The more upstream field would be placed from Canon Perdido Street to below the Ortega Street Bridge. The second would extend from upstream of the Gutierrez Street Bridge to the upper bend of the natural oxbow, immediately upstream of US Hwy 101. The rock energy dissipators would have two functions. First, they would dissipate the force of currents at vulnerable places along the creek. Second, they would impart natural turbulence and heterogeneity to the stream as a means to improve the aquatic habitat for steelhead (*Onchoryhncus mykiss*), an endangered species known to migrate through this reach of Mission Creek.

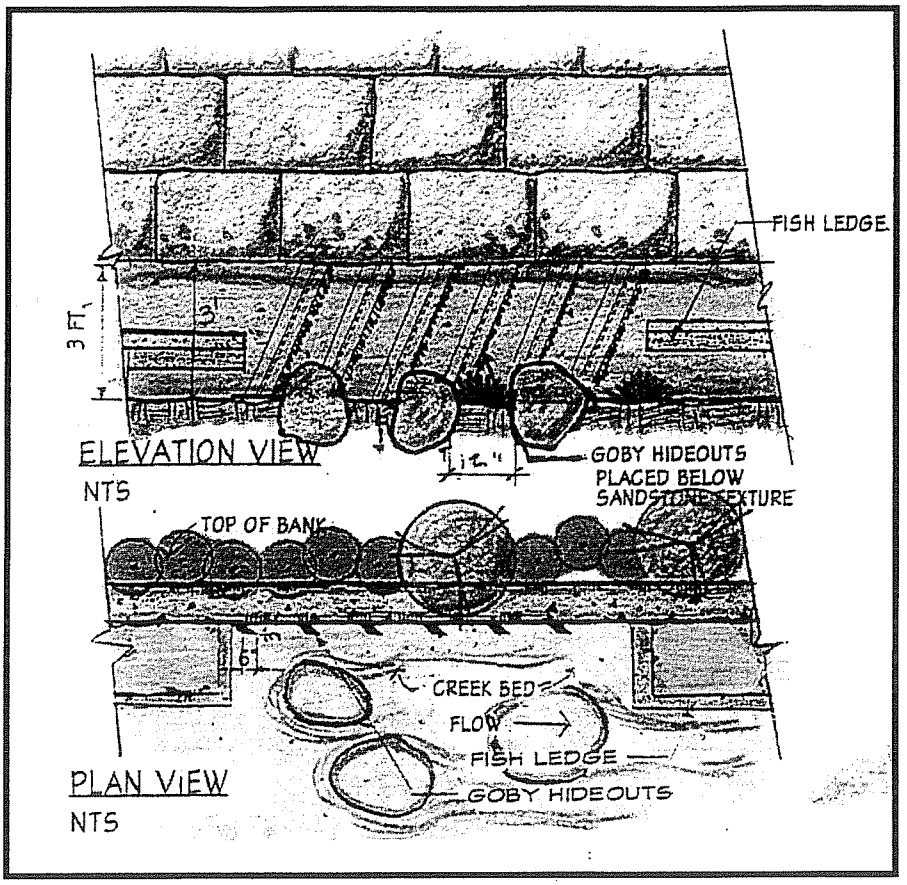



**Figure 3.5.2.1-18. Goby Refugia, Fish Ledges and Fish Baffles Along the Walls in the Estuary (Between Mason Street and Cabrillo Boulevard)**

The combination of these three features would be used within the estuary between Mason and State Street Bridges. The goby refugia and the fish baffles would be used for the remainder of the project reach. The locations of these features are shown on Exhibit 4, Sheets 1-5 of the Main Report.

The goby refugia where gobies and other small fish could escape strong currents would be made in a pattern of slanted ribs as illustrated. These molded ridges would extend from the ordinary high water mark to the bottom of the formed wall, roughly eight feet in vertical length. Most of the time water in the estuary would cover them completely and each would extend well below the streambed. Lower velocity and localized eddy currents would exist around these ribs, primarily caused by the effects of protruding ribs on the boundary layer adjacent to the wall itself. Small fish the size of gobies would easily find the recesses on their downstream side and take advantage of the refugia from currents created by these mitigation structures.

**Fish Ledges**:

The second component of structural mitigation features, intended primarily for steelhead and other large fish, would consist of projecting ledges (fish ledges). The ledges would cantilever from the wall 2 feet into the flow, be 6 inches thick, and roughly 50 feet long typically. Within the estuary, cantilever ledges would be built at varying heights, say 10 to 20 inches, above the invert of the streambed and substantially below the ordinary high water level. Water would cover these ledges at all times except during the lowest low tides and all fish could easily swim beneath them.

The space between successive fish ledges allows a third mitigation measure. A double row of large, angular rocks would be nestled together and placed against the wall at the foot of the ribs. Ranks of boulders would extend into the creek about 5 feet from each wall. The innumerable crevices, voids between rocks, and spaces between rocks and the wall itself formed in this orderly jumble would provide natural habitat for small fish and invertebrates. A fraction of those spaces should prove large enough for steelhead smolt also to find shelter amongst the rocks.

Ribs, boulders, and ledges would line both sides of the estuary between Mason Street and State Street. Ribs and boulders only would extend from State Street to Cabrillo Boulevard. All surfaces in this section of the project would have all three features intermixed, although a ledge on one wall would face ribs and boulders on the opposite wall (accompanying figure, where ledges are not drawn to scale length). Lengths of the walls allow 380 linear feet of fish ribs and boulders and 240 linear feet of overhanging ledges on the left hand side; 360 linear feet of fish ribs and boulders and about 300 linear feet of ledges on the right-hand side.

**Fish Ledges upstream of Mason Street**. Overhangs of like design would be placed along the riverine sections of the creek (including the length between Mason and Yanonali Streets, otherwise treated as the upper end of the estuary) where currents should impinge against the wall and scour persistent holes under these ledges. Adult steelhead would have access to these pools during upstream migration. All manner of aquatic animals would take advantage of these sheltered pools throughout the dry season.

Walls on both sides of the creek would have fish ledges, placed as indicated by current patterns (locations are shown in Exhibit 4, Sheets 1 through 5 of the Main Report). Four would be built along the left hand side (approximately 200 linear feet, in total) and five constructed against the right hand side (total of 250 feet in length).

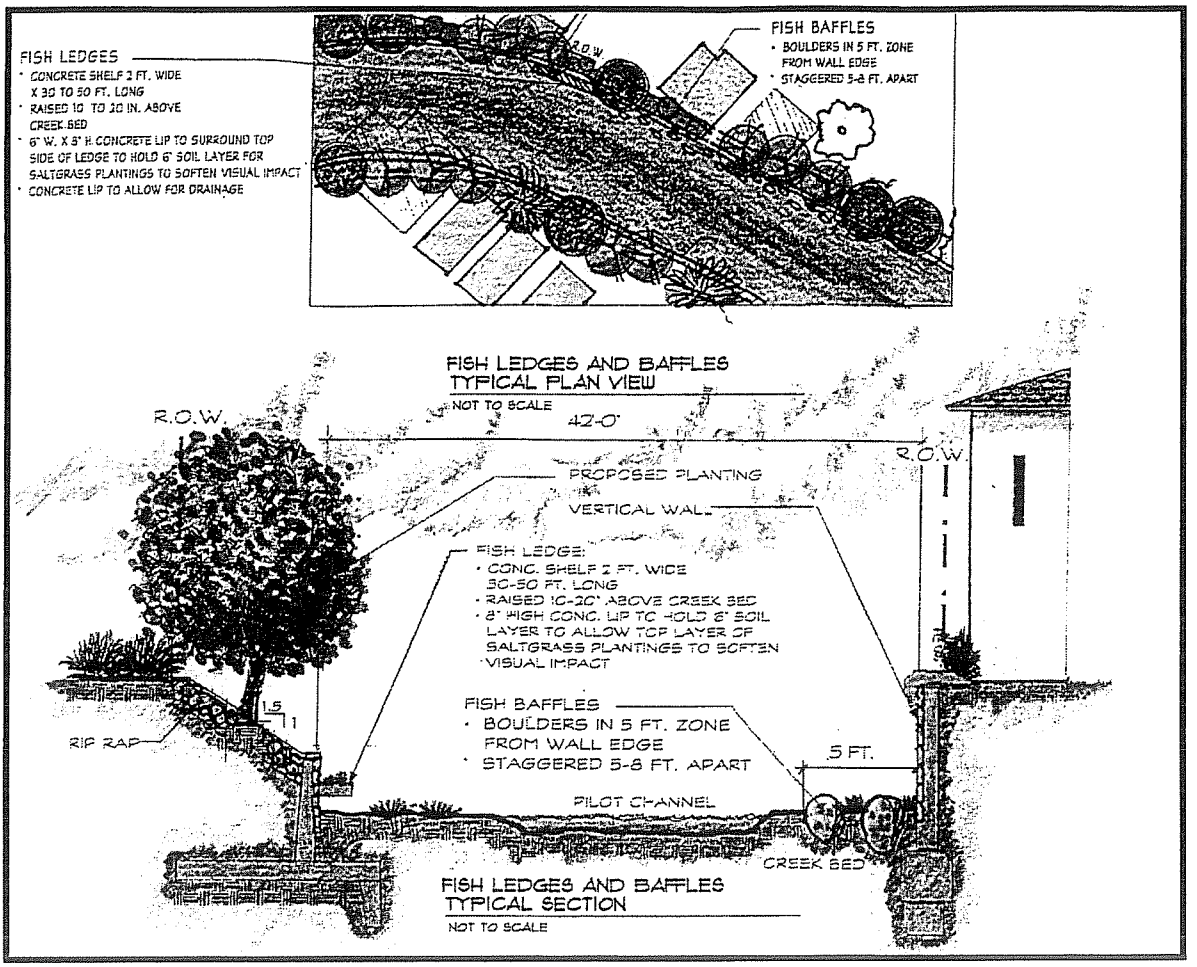



**Figure 3.5.2.1-19. Representative Cross Section Showing Fish Ledges and Baffles along the Walls Upstream of Mason Street**

**Fish baffles upstream of Mason Street.** Arrays of large boulders placed to the inside of walls would impart diverse flow patterns and a valuable measure of aquatic heterogeneity, lacking which, the creek's streambed would mostly resemble an unrelentingly flat surface characterized by steady sheet flows. Their mass and position adjacent to the wall, and thereby within the boundary currents inherent to sides of the channel, would minimize the incidence of currents dislodging them.

Each baffle would consist of a rank of large rocks or derrick stone placed touching the inside surface of the walls, with a second rank inside the first and closer to the creek. Rocks would stand proud of the streambed by 18 to 24 inches. Together, the two ranks would extend inward toward the creek approximately 5 feet. A space of 5 to 8 feet would separate individual

rocks, or perhaps pairs of boulders, to facilitate periodic removal of sediments from between them.

Fish baffles would occupy locations in lower velocity sections of the creek, on one side or the other as appropriate to its curvature (locations are shown in Exhibit 4, Sheets 1 through 5). In certain lengths of the creek side baffles would be placed along one side only, then for another length be built against the opposite side. Many baffles would extend along 150 feet of the creek's side, a few up to 200 feet in length, while others would be shorter by necessity. Design restrictions prevent their placement beneath bridges, for a certain distance on the upstream side of bridge abutments, and directly opposite other baffles or ledges.

The creek's channel allows fish baffles to be interspersed with ledges as indicated by the prevailing direction of currents and streambed to encourage formation of varied stream features. Side baffles would be installed over approximately 1400 linear feet of the stream's edge; 675 linear feet of fish baffles on the left and 725 linear feet on the right side.

**In-Stream Boulder Clusters.** Baffle structures the full width of the streambed and 300 feet in length would combine clusters of large boulders and fields of riprap at two locations; immediately upstream and downstream of the De la Guerra and Gutierrez Street Bridges as shown in Exhibit 4, Sheets 1 through 5 of the Main Report.

Stone used for riprap would be as large as 15 inches in diameter and of angular character. Larger boulders, essentially individual derrick stones of 3 to 4 feet diameter each, would be set down into the surrounding riprap, placed 5 to 8 feet apart, and arranged in clusters of 6 to 9 individual boulders. Tips of the rocks would protrude 1½ to 2 feet above the streambed.

The boulder patches would constitute islands of very coarse and permanent streambed irregularities. Upstream of them, Mission Creek would tend to flow as a homogenous, single current. By their placement, these clusters ought to disrupt that flow regime and induce smaller and intertwined subcurrents. These many smaller currents should continually reshape the longitudinal profile over the length of the baffles fields and downstream of them for some way.

Each cluster of boulders would naturally form various internal cross currents and protected patches of water. Placement of clusters within the baffle is intended to promote the variety of water conditions trout seek out in natural streams, so clusters would be placed to outline a sinuous and meandering predominant channel, one that shifts back and forth across the streambed.

**Material Required for Construction:**

Material required for project construction would include earth-fill material; concrete for walls, footings, and the box culvert; rocks/riprap for slope protection; steel reinforcement for concrete support; filter material; fencing material; top soils; planters; and material required to establish vegetation. Most of the material would be obtained from a distance of about 5 to 10

miles radius from the project area, except rocks/riprap. Riprap may be obtained from existing quarries located within about 50 miles. Table 3.5.2-1 provides type, amount of material, distance to be transported, total number of truck trips and estimated truck trips required per day to transport construction related material.

About 17,000 to 18,000 cy of excavated material from the creekbed and banks would be utilized during project construction as fill material. Backfill material would be transported to the project site on an as-needed basis. It is estimated that about 50 to 100 cy material would be required each day for the period of project construction. Therefore, about 3 truck trips would be required to transport the backfill material to the construction site. Maximum one way travel distance would be about a mile.

**Duration of Construction**:

Project construction, including the proposed creek improvements, oxbow culvert, and bridge replacements, is expected to take a minimum of two years to complete. During construction, excavation activities would not be carried out during heavy storm or rainy season. Every effort would be made to complete the project construction within two years. However, due to weather conditions/seasonal heavy rainfall, mechanical failure, or funding constraints, the project construction could be delayed. In that case, project construction could take up to three or four years to complete. Project construction is scheduled to begin in mid-2003.

Project construction would not occur within the flowing water between mid-December through March to avoid potential impacts to adult steelhead, a Federally listed species. Between April and the end of May, a qualified biologist would monitor locations upstream for the presence of young steelhead preparing to swim down to the ocean. By agreement with the NMFS, construction would be allowed between April 15 and June 1 provided that there is no continuous surface flow (water more than ½ an inch deep) occurs between Oak Park and the project area. Either the USACOE or an environmental contractor would fulfill this monitoring commitment. Temporary, brief suspensions of construction could occur during these two months.

**Staging / Stockpiling Areas:**

The proposed staging area would be located north of Highway 101 adjacent to the channel with access from De la Vina Street. This area could also be used for construction access. Another possible staging area would be located north of the channel between the railroad and Yanonali Street. Additional access points could be at State Street, Mason Street, Montecito Street, Cota Street, Bath Street, Ortega Street, and north of De la Guerra Street. At these staging areas, the selected contractor would install temporary trailers with sanitary facilities. Small quantities of material excavated (about 3000 to 4000 cy) from the creekbed would be stockpiled at these local staging areas, but the majority of it would be transported to the remote

stockpile/disposal site, about 20 miles from the project area. Material would be processed on site to be used for the project construction. Suitable material, about 18,000 cy, would be utilized in the project construction. See plans located at the end of the section for the staging area location.

The staging area is a part of the project description. The staging area is located along the creek banks. The staging area is marked on the plans located in the Main Report. Impact analysis of the staging area is incorporated in the alternative analysis. Except for biological resources, no separate impact analysis has been provided for other resources.

**TABLE 3.5.1-1**
**CONSTRUCTION MATERIAL**
**AMOUNT OF MATERIAL AND RELATED TRUCK TRIPS**

| Type and Amount of Material | Total Number of Truck Trips | Travel distance per truck trip | Total # of Truck Trips (360 days) |
|---|---|---|---|
| Total backfill Material 18,000 Cy | 900 (Total Truck Trips) | 1/4 mile | 3 truck trips/ day |
| Concrete 13,000 C.Y | 650 (Total Truck Trips) | 5 mi-one way-10 mi-two way | 2 truck trips/ day |
| Steel reinforcement 1,640,160 lbs | 3000 (Total Truck Trips) | 5 mi-one way-10 mi-two ways | 8 truck trips/ day |
| Riprap 3,560 tons | 560 Total Truck Trips | 50 mi-one way-100 mi-two ways | About 1 truck trip/day |
| Planting Material:<br>Top Soils -1,052 Cy<br>12" dia. Planters - 420<br>36" dia Planters 1,015<br>33,210 sq. ft. of shoring (wood) | About 50 Total Truck Trips<br>About 2 Truck Trips<br>About 12 Total Truck Trips<br>20 Total Truck Trips | 5 mi-one way -10 mi- two ways<br>10 mi-one way - 20 mi-two ways<br>10 mi-one way - 20 mi-two ways<br>10 mi-one way - 20 mi two ways | About 1 truck trip/ day |
| 6,920 linear feet fencing | 15 Total Truck Trips | 5 mi-one way -10 mi-two ways | 1 truck trip/ day |

**Equipment for Construction**:

For the project, construction equipment would include bulldozers, grader, trencher, crane, off-highway trucks, water trucks, etc. Most of the equipment would be used for 8 hours a day. The equipment would be stored at the staging area. The following paragraph provides numbers and details regarding construction related equipment.

- *Safety Equipment* (throughout construction)
- *Dumpster (1)* (throughout construction)
- *Pickup Trucks (3)* (Eight hrs/day throughout construction)
- *C10BO003 BP 10/36 Vibratory Plate*, 14.2" X 21.5" Plate (Compactor) 4 hp
- *(4) 12 Cy Bucket (Excavator) , LTWT, Crescent Scrapers* - 250 hp (Eight hrs/day throughout construction).
- *(3) Concrete Vibrators* 2.50 D EL,HI-FREQ - 120 hp
- *(2) Hydraulic Cranes*, truck mounted, 60 ton/115' Boom - 350 hp
- *(5) Generators*, 5.5 KW, 120/240V, Portable - 20 hp
- *(4) Bulldozers*, D-9N, PS (Add-Blade)
- *(3) Concrete pumps* 25 cy/hr. trailer mounted - 30 hp
- *(4) Fork Lifts* 2500# @24" Load Center, 13.50' L-HT - 18hp
- *(2) Graders* - Articulated Frame, Powershaft - 135 hp
- *(4) Stumper* 18" dia. wheel, trailer mounted - 34 hp for land clearing
- *(2) Flail mower*, 68" wide, 4" HT 1" CAP (Add 30 hp tractor) (Three months use for 8 hrs./day)
- *(3) Hydromulcher*, 3000 gal. for hydroseeding plus 56,000 GVW Truck - 250 hp (3 Months, 8 hrs./day)
- *(1) Groundmaster* 62" deck w/118 TRACTOR 17 hp
- *(2) Trenchers* 24" deep x 4' wide, walk behind 13 hp (8 Hrs/day- throughout construction)
- *(7) 18 cubic yard off-highway trucks* - 335 hp (throughout construction)
- *(3) 5,000 gallon water trucks* - off/highway 175 hp (throughout construction)
- *(8) passenger vehicles* (throughout construction)

**Construction Crew:**

About 20 to 30 construction crew members would be required to construct the proposed project for a period of about two years. Most of the construction workers would come from a radius of about 20 miles, residing within the City or County of Santa Barbara. Maximum one-way travel distance would be about 20 miles. It is estimated that about 20 to 30 passenger vehicles would be used by the construction crews for commuting during the duration of the construction. It is estimated that construction would take about 2 years (about 440 working days).

**Haul Routes:**

Hauling of materials and equipment to and from the project site would primarily use Highway 101 and the three nearby on/off ramps. Carrillo Street on/off ramp is located near the upstream end of the project, while Castillo Street on/off ramp is near the lower end and provides the most direct route to the proposed staging and stockpiling sites. Access and haul routes from the staging and stockpiling sites to the specific creek construction site would use streets that are nearest to the creek, taking the most direct route. Above Highway 101, it is expected that De la Vina, Castillo, and Bath Streets would generally be the main haul route to and from the staging area, while Castillo, Montecito, Yanonali, Mason, and State Streets would provide the main access during construction downstream of Highway 101.

**Invert Access Ramps**:

Approximately three access ramps would be designed to access the channel bottom for construction and maintenance. The location of these would likely be at the following locations:

**Canon Perdido**: Located on the north side downstream of Canon Perdido Street. Access would be from the adjacent parking lot.

**Bath Street:** South side downstream of the Bath Street Bridge. Access would be from Cota Street.

**Gutierrez Street**: South side downstream of Gutierrez Street. Access would be from De la Vina Street.

### 3.5.3 Operation and Maintenance

#### 3.5.3.1 Existing Operation and Maintenance:

Santa Barbara County currently performs routine maintenance of Mission Creek, including the proposed project reach. Maintenance activities include: removal of debris/sediment, streambed vegetation, and urban trash (including large items such as shopping carts, water heater tanks, and other household items); channel desilting and shaping; and application of herbicides to control obstructive vegetation. Typically, sediment removal has occurred prior to the beginning of the rainy season unless channel inspection determines that sediment removal is unnecessary. Channel shaping has been performed using heavy equipment such as dozer or loader and crane. Removed sediment has been transported to one of the CalTrans stockpile areas. Santa Barbara County has prepared a Program EIR and Addendum to the Programmatic EIR (Santa Barbara County Flood Control Routine Maintenance, 1997). The environmental resources have been

described in both documents. Mitigation measures have been identified in these reports to minimize impacts to environmental resources.

R 3.5.3.2 **Future Operation and Maintenance:**

Perpetual maintenance of the creek is an integral part of the Recommended Alternative (Alternative 12). To ensure and maintain its design function and form, some maintenance to maintain the design capacity of the channel would be needed on a regular basis. Any areas where sediment deposition and/or vegetation growth occur beyond 15% of the channel capacity would be required to be removed to maintain the capacity of the project reach. Future maintenance would also include maintenance of the structures such as cleaning of oxbow culverts, repair of vertical concrete walls and riprap (bottom riprap lining and baffle piers), structures for mitigation, and maintenance of planted vegetation (after initial establishment required as part of project construction). It is estimated that the frequency of sediment removal would be at an interval as often as once a year. However, when several low-flow years occur sequentially, sediment removal might occur every two to three or more years. Floodflows and debris accumulation and removal would continue to impact channel vegetation and aquatic resources. Over time, pools and riffles that provide aquatic habitat would reestablish in the channel.

Impact analysis for future maintenance is included in each resource is discussed in this EIS/EIR. Impacts related to maintenance activities are addressed in Sections 6 through 19. Mitigation measures for future operation and maintenance for the life of the project are included in this EIS/EIR. Conditions identified in the EIS/EIR would be followed during each operation and maintenance activity. A brief description of each activity is provided in the following paragraphs.

**Future Maintenance of the Pilot (Bank-full) Channel:**

The need for maintenance of the creek's capacity will occur after completion of the project. When or if, sedimentation in any reach particular project reach in the project area exceeds 15% of the flow capacity. When maintenance needs do not dictate removal of sediments, the County Flood Control District would not alter the currently existing pilot channel, but instead only would cut such vegetation as has begun to grow to unacceptable size. When sediments must be removed during the course of normal maintenance activities, the County would finish the work by reconstructing the pilot channel. This rebuilt channel would deliberately follow whatever course the creek had imposed on the original alignment of the pilot channel. In this fashion, the pilot channel would reflect an alignment that came about through natural processes, and which would be optimally efficient in the transport of sediments during low flow times of the year. The maintenance cycle would conclude by enrichment of the rebuilt channel with representative types and gradations of the larger native substrates.

**Channel Shaping and Channel Desilting - Sediment removal:**

The Corps of Engineers performed a sediment transport budget analysis for the recommended plan. The general results indicated that there would be localized areas throughout the project reach that would experience either sediment deposition or erosion/scour conditions. An approximate qualification of these processes for with- and without project conditions is summarized and presented in respective sediment budget tables found in Appendix B - Hydraulics.

The change from existing conditions to design conveyance capacity would alter the net sediment budget for the entire project very slightly. A net total of 25 $yd^3$ should accumulate each time the creek carries an average storm event. In contrast, individual higher peak flows should promote net erosion from the streambed, 35 $yd^3$ during a 5-year storm event and roughly ten times that quantity removed during a single design event. Future sediment accumulation is dependent upon the size and number of storm events. However, the future maintenance would be similar to the existing maintenance performed by Santa Barbara County. As an example of maintenance activities, the last time the County removed about 350 $cy^3$ sediment between Canon Perdido Street and Highway 101 in summer of 1997. Evidently, no sediments were removed from the sandstone channel (between Montecito and Yanonali Streets) at that time. No maintenance of any kind had been performed in the estuary (between Yaonali Street and Cabrillo Boulevard). No malignance would be required within estuary.

**Duration of Future Operation Maintenance:**

Usually, sediment removal would occur only when the flow of water approaches the seasonal minimum, i.e. between mid-August and mid-October. Operation and maintenance would not occur between December and March to avoid impacts to steelhead and tidewater gobies, both Federally listed species. However, in the case of a heavy storm event, operation/maintenance of the channel invert could be required between December and March. If maintenance work occurs during these months in flowing water, a qualified biologist would be needed on site to monitor the sediment removal activities. Environmental commitments identified in Sections 6 through 24 would be followed during future sediment removal operations.

Future sediment removal activity may take about 15 to 30 days per year. On average, about 20 truck trips per season could be required to transport deposited material. Material depositing in the creek bed would vary according to the flooding event. Therefore, about 2 to 4 truck trips per day could be required to remove the sediment. Material would be transported to an identified disposal site about 20 miles from the project area, unless mechanical analysis of the sediment shows that the material meets criteria for beach deposition.

It is estimated that the average frequency of sediment removal could be as often as once a year. However, when several low-flow years occur sequentially, sediment removal might occur every two to three or more years. Any areas where sediment deposition and/or vegetation growth occur significantly as to impair the designed conveyance capacity of the creek, clearing shall be performed as soon as possible to restore the creek to its design function and form.. The expected maintenance activities are addressed in the following sections:

***Stream Bed Maintenance.*** Inspection and maintenance of the streambed would address vegetation control, fish baffles, rocky energy dissipater and boulder fields, desilting, and shaping. Vegetation control would be accomplished by either brushing, clearing or spraying. Clearing could be done using a mechanical equipment such as a dozer. Partial removal of vegetation would occur yearly. The removal would follow a mosaic pattern, wherein one half the creek bed would be cleared while the other half would be cleared the following year. The alternate clearing method would be repeated for the subsequent years. Fish baffles, rocky energy dissipaters and boulder fields shall be periodically inspected. Rip-rap or boulders designed to be placed within the streambed shall be replaced back into the intended design location, if removed or dislodged by any means. Maintenance for the desilting and streambed shaping would typically be done with a dozer or loader. Typically accumulated sediment would be pushed to an area where the material can be loaded directly into trucks driving on the channel bottom or to an area where a crane (at the top of bank) can access the material, which could then be loaded into trucks and hauled to a suitable disposal site. It is possible that lesser amounts of sediment could be placed on the riprap slope.

***Channel Wall Maintenance.*** Concrete sections of the channel improvements include decorative variable height concrete walls, goby hideouts on the estuary walls, fish ledges, approaches to bridges. Inspection and maintenance of the channel walls, fish ledges, and the cut stone channel shall address the following:

- Cracking, chipping or breaking, and eroding of the concrete to an extent which might affect the stability of the wall or its water tightness.
- Evidence of settlement, uplift, scour or failure of concrete structures shall be given special attention;
- Necessary steps shall be taken to prevent damage to, or loss of, backfill behind walls through settlement, unauthorized removal of soil and sloughing of soil from adjacent property; and
- Weep holes shall be cleaned on a regular basis. Accumulated debris shall be removed from the front of any weep holes.

Any adverse conditions encountered shall be repaired as soon as possible

***Overflow Culvert and Weir Structure.*** The overflow culvert to bypass high flows around the Mission Creek oxbow will be constructed under Highway 101 (station 25+09 to 30+40). The culvert will be approximately 34' wide (including wall thickness) with a divider wall down the center. A weir will be constructed at the upstream end of the culvert (station 31+00 to station 33+10). The weir will direct lower flows into the oxbow. Higher flows will go over the weir and into the culvert. Inspection and maintenance of the channel walls and the cut stone channel shall address the following:

- Cracking, chipping or breaking, and eroding of the concrete to an extent which might affect the stability of the culvert or its water tightness.
- Evidence of settlement, uplift, scour or failure of concrete structures shall be given special attention;
- Weep holes shall be cleaned on a regular basis. Accumulated debris shall be removed from the front of any weep holes;
- Sediment and debris deposited within the culvert shall be removed. Sediment removal shall be conducted by pushing the accumulated sediment to the inlet and/or outlet where the material can be removed with a crane or excavator.

Any adverse conditions encountered shall be repaired as soon as possible.

***Vegetated Riprap Slope Banks and Other Appurtenances.*** Channel banks above the vertical concrete walls shall be constructed of 15" rip-rap on 1.5:1 slopes with 6" of fill over the rip-rap. Planting pockets (vertical concrete pipes) would be included for various trees and shrubs to provide habitat and ultimately develop a canopy, which would shade the creek bottom. Inspection of the creek banks shall address the following:

- The growth rates of the trees and shrubs shall be documented for 5 years as outlined in the Environmental Commitments discussed in the EIS/EIR. If the plants do not meet pre-determined growth rates, actions shall be taken to improve growing conditions such as fertilization and increased irrigation; Planted vegetation should be maintained by the County for the life of the project.

- Trees and shrubs that do not survive shall be replaced as soon as possible with local stock;

- Rip-rap shall be periodically inspected. If rip-rap is removed or damaged by and means to the extent that the integrity of the project is compromised, it shall be replaced;

- The layer of fill over the rip-rap shall be maintained to encourage understory growth. Periodical soil augmentation on the banks may be accomplished by using deposited streambed sediment or imported soil from other areas. This will typically occur when earthen channel maintenance is required;

- Areas of the bank that are damaged by scour, erosion, or other means shall be replaced as designed as soon as possible. This includes the filter fabric, rip-rap, fill, and plants;

- Obstructive debris shall be removed from the creek banks;

- Non-native vegetation shall be controlled with herbicide and/or removed;

- Access ramps shall be kept clear of debris and obstructions. Grass shall be encouraged on the ramps. Gates at the access ramps shall be locked and kept in good working condition;

- Any damage to fencing and rails along the top of the creek banks shall be repaired as soon as possible; and

- Coordinate trash removal with local volunteer groups or other agencies.

Any adverse conditions encountered shall be documented in the District's Annual Maintenance Plan, the annual re-vegetation monitoring plan, or the annual report.

***Habitat Expansion Zone Maintenance:*** Habitat Expansion Zones shall be created in the vicinity of stations 16+00, 19+00, 38+50, 51+00, and 60+00. Parcels ranging in sizes from 0.03 to 0.52 acres will be planted with native vegetation. The Habitat Expansion Zones will provide riparian habitat along the creek and also provide recreational areas for local residents. Inspection and maintenance of the channel banks shall address the following:

- The growth rates of the trees and shrubs shall be documented for 5 years as outlined in the Environmental Commitments discussed in the EIS/R and/or vegetation should be maintained by the local sponsor for the life of the project.

- If the plants do not meet pre-determined growth rates, actions shall be taken to improve growing conditions such as fertilization and increased irrigation. Trees and shrubs that do not survive shall be replaced as soon as possible with local stock;

- Non-native vegetation shall be controlled with herbicide and/or removed.
- Coordinate trash removal with local volunteer groups or other agencies.

Any adverse conditions encountered shall be documented in the District's Annual Maintenance Plan, the annual re-vegetation monitoring plan, or the annual report.

Mitigation Monitoring Plan located in Appendix H of the EIS/EIR identifies details regarding planting /success criteria, goals and monitoring requirements.

***Interior Drainage***. Drainage structures, such as stormdrains, are installed through the concrete channel walls and channel banks at strategic locations to pass interior drainage into the channel. The drainage structures such as pipes, headwalls, outlets, etc. shall be maintained to preserve their function.

***Inspections***. Santa Barbara Flood Control District staff in addition to representatives from regulatory agencies, the Corps of Engineers, and representatives from local public interest groups would conduct periodic inspections to ensure the project is being maintained properly. These inspections shall determine the condition of the various components of the project and disclose any areas that require repair, replacement, or maintenance. Inspections shall occur in the spring after the rainy season, in the fall immediately prior to the rainy season, and after major storms.

The recommendations set forth in this Maintenance Plan shall be incorporated as appropriate into an "Operations and Maintenance Manual" to be prepared by the Corps of Engineers during preparation of final plans for the proposed project.

**Removal of Urban Trash:**

Lower Mission Creek flows through a densely populated area of the City of Santa Barbara. During site visits, it was observed that litter is common in the channel and adjacent areas, and increases in quantity proceeding south along the channel. Urban trash includes large items such as shopping carts and household items. At every maintenance period, these items would be removed from the project reach to reduce impacts on water quality and biological resources. The local sponsor will also work with other agencies and volunteer groups to provide additional trash removal as needed.

3.5.3.3 **Operation and Maintenance of Structural Features:**

**Vertical Concrete Walls**:

The vertical concrete walls are designed to be stable and should not require periodic maintenance.

**Bottom Riprap Lining and Baffle Piers**:

Bottom riprap lining (boulders placed as energy dissipators) and baffle piers at the opening of the high-flow bypass are designed to be stable for the channel design capacity of 3400 cfs and should not require periodic maintenance. Flow conditions exceeding this design capacity may cause possible displacement of stones. After storm flow events exceeding the design capacity, riprap would need to be replaced to the original thickness and grade.

**Equipment for Future Maintenance:**

Front-end loaders (both full sized and miniature), tracked excavators, mobile conveyor belts, and dump trucks (20 cubic yard capacity) would be appropriate. All equipment would enter and leave the creek only at the identified access points. Refueling and lubrication of equipment would not occur within the stream channel.

3.5.4 **Alternative No. 6: 3400 CFS Capacity Without Oxbow Bypass - Stabilized sides using predominantly vegetated stepped walls with vertical walls applied for the remaining reaches.**

This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of protection. The natural bottom would be maintained and would consist of vegetated stepped banks at a 2:1 (V:H) slope upstream of Highway 101. Below Highway 101, vegetated stepped walls would be applied along the southeast bank, starting from midway between the Chapala and Mason Street Bridges to the State Street Bridge, and along the middle third of the southwest bank between Mason and State Streets. Vertical walls would be maintained for the remainder of this reach. The improved creek would generally follow the existing alignment throughout the project reach. The creek would be 50 to 70 feet wide at the top of the bank and 8 to 12 feet deep. Seven bridges along the study reach would be replaced, including the Ortega Street, Cota Street, De la Vina Street, Montecito Street, Union Pacific Railroad, Chapala Street, and Mason Street Bridges. Habitat expansion zones are also a project design for this alternative. Future maintenance would remain the same as identified under Alternative 12. This alternative would have all features identified under Alternative 12, except installation of culvert and stabilization of creek banks with vegetated stepped walls. The remaining project description would be the same as identified under Alternative 12. This

alternative also would provide incidental environmental benefit. It would not be as environmentally damaging as fall vertical walls.

**Without Oxbow Bypass:**

Lower Mission Creek develops a meandering course near downtown Santa Barbara; an oxbow has been developed between Yanonali and Gutiereez Streets. This alternative would involve stabilization of the creek banks and modification of the creek course along the oxbow, including removal of the manmade sandstone channel. Construction along and/or within the oxbow area is called "Without Oxbow Bypass". The location of the oxbow is shown on Figure 3.5-2.

**Stepped Walls:**

Under Alternative 6, the creek banks would be stabilized by construction of stepped walls instead of riprap. The extent of such walls would vary somewhat. The step would allow planting of appropriate species into spaces filled with soil. These steps would be uniformly five feet wide, which would allow planting of vegetation along the creek banks. Planted shrubby native species along stepped walls would grow to the status of an understory plant community, such as would have been found historically along coastal streams in this region of southern California; however, the associated overstory of large trees would not be included.

### 3.5.5 Alternative No. 8: 3400 CFS Capacity with Oxbow Bypass - Stabilized sides using vertical walls.

This alternative would increase the channel capacity to 3,400 cfs and would provide approximately a 20-year level of protection. The natural bottom would be maintained while bank treatment would consist of concrete vertical walls throughout the project reach. This alternative would incorporate a new culvert, by-passing the oxbow between just above Highway 101 and the Chapala Street Bridge. The improved creek would generally follow the existing alignment except at the oxbow which would be left in place to function as a low flow channel. The creek would be 44 to 60 feet wide at the top of the bank, except between the State Street and Cabrillo Boulevard Bridges where it would be 60 to 70 feet wide. The average depth of the creek would be between 8 and 12 feet. Culverts would be installed in an open space, near the Moreton Bay Fig Tree, between Gutierrez and Yanonali Streets. Installation of culverts outside of the creek bed is called "With Oxbow Bypass" (see Figure 3.5.2). Five bridges along the study reach would be replaced, including the Ortega Street, Cota Street, De la Vina Street, Chapala Street, and Mason Street Bridges. The project features for this alternative are similar to Alternative 12, except the sideslopes would be stabilized by vertical concrete walls instead of combination of short-vertical walls and vegetated riprap. Habitat expansion zones are part of this alternative design. This alternative would result in significant impacts on aesthetics and recreational

resources. This alternative would not provide environmental benefits which would be provided by Alternatives 12 and 6. Please refer to Alternative 12 for detailed project description.

## 3.6 COMPARATIVE IMPACTS OF ALTERNATIVES:

Table 3.6-1 provides a summary of impacts and mitigation measures by alternative.

TABLE - 3.6-1

LOWER MISSION CREEK FLOOD CONTROL PROJECT
SANTA BARBARA, CALIFORNIA
(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)

**Brief Description of Alternatives:**

| | |
|---|---|
| Alternative No. 1: | No Action |
| Alternative No. 12: | 3400 CFS Capacity with Oxbow Bypass; Stabilized sides using predominantly combination of vertical wall and riprap. |
| Alternative No. 6: | 3400 CFS Capacity Without Oxbow Bypass - Stabilized sides using predominantly vegetated stepped walls with vertical walls applied for the remaining reaches. |
| Alternative No. 8: | 3400 CFS Capacity with Oxbow Bypass - Stabilized sides using vertical walls. |

***Numbering of Alternatives is kept the same as Main Report for consistency and comparison purposes. Alternatives are also not in a sequential order because at AFB conference, decision was made that Alternative No. 12 is the NED and tentatively Recommended Plan. Therefore, detailed project description is developed for Alternative # 12 and placed prior to the other evaluated alternatives.***

**TABLE 3.6-1 (CONTINUED)**
**LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA**
**(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)**

| Resource | Alt. No-1 No Action | Alt. No-12 | Alt. No-6 | Alt.-No-8 | Mitigation | Comments/ Recommendations |
|---|---|---|---|---|---|---|
| Geology | No Signifi-cant Impacts | No Significant long term or short term im-pacts | Same as Alt. No. 12 | Same as Alt. No. 12 | No Mitigation required; construction and future maintenance will follow geotech survey recommendations. | |
| Water Quality | | Minor short-term increase in turbidity levels during con-struction and future maintenance. | Same as Alt. No. 12 | Same as Alt. No. 12 | - Stream water diversion shall use pipes/ pilot channel and other standard methods to create low flow diversion channel during construction and future sediment removal.<br>- No construction or sediment removal shall occur in flowing water or during heavy rains. Construction and future maintenance shall not occur during months of mid-December through March, when flow is high in the creek.<br>- Conditions identified in the EIS/EIR shall be followed during construction as well as for future maintenance.<br>- No discharge/leaks or spills of fuels, solvents or lubricants in the creek bed. A Storm Water Pollution Prevention Plan (SWPP) shall be required prior to project construction and implemented.<br><br>**Cost:** 402 - Storm Water Pollution Prevention Plan; $500 fees (local sponsor). The construction contractor will prepare SWPP.<br>1603- Streambed Alteration Agreement (Fish and Game) – Fees of about $500 to 700, paid by the local sponsor.<br>Chemical analysis cost about $10,000 | Chemical Analysis of the excavated material is required prior to disposal. To reduce costs, Corps staff should collect the samples.<br>Permits: 404 Corps permit - 404(b)(1) will be prepared for construction, will submit application.<br>401-WQC- Corps will request certification for both construction and future maintenance.<br>402- SWPP-NOI will be submitted by Corps.<br>1603-California Fish and Game – County will submit an application. |

TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA
(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)

| Resource | Alt. No-1 No Action | Alt. No-12 | Alt. No-6 | Alt.-No-8 | Mitigation | Comments/ Recommendations |
|---|---|---|---|---|---|---|
| Ground Water | No change to existing conditions | In existing condition, hard bottom exists at certain locations within the channel. With the project, the entire project reach would be natural bottom channel which will result in minor increase in ground water recharge. | Same as Alt. No. 12 | Same as Alt. No. 12 | No mitigation required. | |
| Air Quality | No Impacts/ No change to existing conditions | During construction and future sediment removal, short term increase in fugitive dust; no long term impacts on air quality. | Same as Alt. No. 12 | Same as Alt. No. 12 | Water the excavation site, storage piles and unpaved roads twice each day of construction; once in the morning and at the end of the construction day; cover material transported in haul trucks; these conditions are applicable for construction and future maintenance.<br>Limit vehicle speeds to 15 mph maximum within the construction site and maintenance areas (construction and future maintenance).<br>Cease grading and earth movement when wind speeds exceed 20 mph, or as confirmed by SBCAPCD during construction and future maintenance activities. | |

**TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA**
**(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)**

| Resource | Alt. No-1 No Action | Alt. No-12 | Alt. No-6 | Alt.-No-8 | Mitigation | Comments/ Recommendations |
|---|---|---|---|---|---|---|
| Noise | No Impacts/ No change to existing conditions | Short term increase in noise levels due to use of construction equipment and truck traffic. Noise levels will exceed 65 dBA at sensitive receptors.<br><br>Residents located in the vicinity of the project area will experience increased noise levels during construction as well as during future maintenance. | Same as Alt. No. 12 | Same as Alt. No. 12 | Construction and future maintenance: Follow noise ordinance of the City of Santa Barbara. The project area is located within densely populated area; therefore, no loading or unloading of equipment or material shall be performed between 7:00 p.m. and 7:00 a.m., nor shall there be any heavy equipment operation prior to 8:00 a.m. and after 7:00 p.m. Monday through Saturday. No Sunday or holiday operation.<br><br>Truck traffic shall be on designated truck routes established in coordination with the City of Santa Barbara.<br><br>**Coordinate with city for local noise ordinance.** | The selected contractor shall coordinate with the City of Santa Barbara during project construction. The selected contractor shall ensure that noise ordinance set by the city of Santa Barbara would be followed. |

TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA
(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)

| Resource | Alt. Nº 1 No Action | Alt. Nº 12 | Alt. Nº 6 | Alt. Nº 8 | Mitigation | Comments/Recommen-dations |
|---|---|---|---|---|---|---|
| Biological Resources | Impacts related to biological resources have been depicted by type of the species/vegetation | | | | | |
| Endangered Species | No Significant impacts | Incidental impact to steelhead and tidewater gobies could occur, but would be of temporary and insignificant level. Environmental commitments and mitigation measures form essential parts of the proposed plan. | Same as Alt. No. 12 | Same as Alt. No. 12 | No construction or maintenance within flowing water between December 1 and March 31 to avoid impacts to steelhead.<br><br>Qualified biologist shall survey the area prior to the construction for presence of steelhead.<br><br>Tidewater gobies shall be excluded from half the estuary at a time, and fish moved to the wet half while construction zone is dewatered slowly.<br><br>Structural features along toe walls will improve habitat for both endangered species. | Temporary impacts to both species from construction minimized with appropriate environ-mental commitments.<br><br>Mitigation features more than offset impacts<br><br>Area of estuary habitat will more than double, increasing foraging areas for gobies. |
| Aquatic habitat | Approximately 0.4 habitat units removed by periodic channel maintenance | Net increase of habitat quality equivalent to about 0.4 habitat units when compared to Alternative 1. | Net impact to habitat quality equivalent to about 0.5 habitat units in comparison to Alt. 1 | Same as Alt. No. 6 | Strategic placement of large rocks as energy dissipaters; soft bottom throughout flood control project.<br><br>Additional structural features along toe walls will enhance quality of aquatic habitat.<br><br>Maintenance procedures will minimize effects on aquatic habitat. | Expenses for present channel maintenance have been $12,500 a year since 1995. |
| Isolated Native Trees | No significant impacts | 12 to 15 trees will be removed. Western sycamores at two locations would be among them. | Same as Alt. 12 | Same as Alt. 12 | At least 210 trees established in 30 years.<br>Alt. 12 - annual maintenance of trees planted in small parks, 5 years.<br>*Note: Cost of lost Isolated Native Trees is included in mitigation of Stream Bank Vegetation.* | Small parks created from properties razed to accommodate conveyance designs with Alt. 12. |

**TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA (SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)**

| Resource | Alt. Nº 1 No Action | Alt. Nº 12 | Alt. Nº 6 | Alt. Nº 8 | Mitigation | Comments/Recommendations |
|---|---|---|---|---|---|---|
| Biological Resources Continued | Impacts related to biological resources have been depicted by type of the species /vegetation. | | | | | |
| Stream Bank Vegetation | Projected average environmental quality equivalent to 0.48 habitat units. | Projected average environmental quality equivalent to 0.82 habitat units. Stream bank habitat would increase by 0.34 habitat units compared to Alternative 1. | Design features yield 0.52 habitat units. Negligible gain in stream bank habitat quality compared to Alternative 1. | All stream bank vegetation removed without design feature to replace it. Net impact equivalent to 0.48 habitat units. | **Alt. Nº 1**: long-term costs by private property owners for bank stabilization cannot be estimated realistically.<br><br>**Alt. Nº 12**: Planting native trees and shrubs on sloped banks; habitat expansion zones in five locations;<br><br>**Alt. Nº 6:** planting native shrubs on narrow, stepped-wall planters.<br><br>**All build alternatives:**<br>removal of giant reed and other exotic invasive plants within project area; | **Alt. Nº 1**: Scattered and irregular loss of existing bank vegetation as private revetment become more widespread.<br><br>**Alt. Nº 12:** Trees will establish riparian canopy in 30 years, and shrubby vegetation will create under story of riparian community<br><br>**Alt. Nº 6:** Native shrubby trees and other native plants planted in the space available between stepped walls.<br><br>**Alt. Nº 8**: No opportunity to replace existing vegetation lost during construction with any appreciable plantings, native or otherwise. |

TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA
(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)

| Resource | Alt. No-1 No Action | Alt. No-12 | Alt. No-6 | Alt.-No-8 | Mitigation | Comments/ Recommendations |
|---|---|---|---|---|---|---|
| Land Use | Within the project reach, no open space or agricultural lands exist in right-of-way, no impacts to existing land use. | (1) No impacts to agricultural lands, Long-term Permanent Impacts: Buildings or property located within the project right-of-way will be removed or demolished for project construction. Therefore, land use would change from residential to natural creek bed or open space. However, most of the buildings located within the project reach are very old and all property located within the flood plains is subject to severe flood damage during heavy rains or flooding. Land use will change from residential to natural creek bed or open space within the construction right-of-way.<br>(2) This alternative would require demolition of 14 complete and 2 partial structures (includes 1 complete removal of commercial building; 4 single family residential units and 5 multiple family units; 1 patio deck and 1 garage). 1 commercial building would be removed partially. Relocation of existing tenants may be difficult due to the cost of housing.<br>No impact to oxbow area. Culverts would be installed away from the creek. During construction, temporary impacts near fig tree. | (1) Same as Alt. # 12<br>(2) This alternative would require demolition of about 15 complete and 2 partial structures (includes 1 complete removal of commercial building; 4 single family residential units and 5 multiple family units; 1 patio deck and 3 garages). Two commercial buildings would be removed partially. Relocation of existing tenants may be difficult due to the cost of housing. | (1) Same as Alt. No. 12<br>(2) This alternative would require demolition of about 12 complete and 2 partial structures (includes complete removal of 1 commercial building; 3 single family residential units and 4 multiple family units; 1 patio deck and 1 garage). 1 commercial building would be removed partially. Relocation of existing tenants may be difficult due to the cost of housing.<br>Impacts related to installation of culverts are similar to Alternative 12. | The local sponsor will purchase the property and provide compensation to the property owner and tenants and/or property will be relocated.<br><br>See Biological Resources for mitigation of construction impacts on Fig Tree.<br><br>Some minor realignment of the channel and the use of short stretches of full vertical walls, as proposed would result in by the City and County, would result in protecting 5 residential buildings. | Costs of removal of the buildings are included in real estate acquisition |

**TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA**
**(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)**

| **Resource** | **Alt. No-1 No Action** | **Alt. No-12** | **Alt. No-6** | **Alt.-No-8** | **Mitigation** | Comments/ Recommendations |
|---|---|---|---|---|---|---|
| Socio- economics | Property located along the creek bank would experience economic damage during each severe flooding season. Some commercial establishments would lose business. | ( 1) Long Term Impacts: Some of the property located along the creek bank would be removed. There would be economic loss to the property owner. However, property located within the flood plain would be protected from flooding hazards in future.<br>Demolition of structures/ buildings: Refer to Land Use Section. Relocation of existing tenants may be difficult due to the cost of housing.<br>(2) Alternative 12 would require removal of 14 full structures and 2 partial. See details on type of the structures in Land Use Section. | (1) Same as Alt. No. 12.<br>(2) This alternative would require demolition of about 15 complete and 2 partial structures (includes complete removal of 1 commercial building; 4 single family residential units and 5 multiple family units; 1 patio deck and 3 garages). Two commercial buildings would be removed partially. Relocation of existing tenants may be difficult due to the cost of housing. | (1) Same as Alt. No. 12<br>(2) (2) This alternative would require demolition of about 12 complete and 2 partial structures (includes complete removal of 1 commercial building; 3 single family residential units and 4 multiple family units; 1 patio deck and 1 garage). 1 commercial building would be removed partially. Relocation of existing tenants may be difficult due to the cost of housing. | The local sponsor would purchase the property or relocate the housing or commercial units to a safer zone. The property owner would receive compensation equal or more to their property value; therefore, project related impact is not significant. All property removal would be fully mitigated.<br>**Costs:** Costs included in real-estate acquisition. | |

TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA
(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)

| Resource | Alt. No-1 No Action | Alt. No-12 | Alt. No-6 | Alt.-No-8 | Mitigation | Comments/ Recommendations |
|---|---|---|---|---|---|---|
| Aesthetics | No Change in existing visuals | (1) Short-term: During construction, equipment and stockpile material would degrade aesthetic value of the project area. However, this impact is short term and would not be significant.<br><br>(2) Long Term: Aesthetics/visuals of the creek banks would be improved with stabilization of banks. Implementation of this alternative will provide maximum aesthetic value. Creek will be more natural looking. Provides maximum vegetation cover. Bottom of the creek can not be seen from top because riprap will be planted with native and riparian vegetation. Aesthetic treatment would be provided to the vertical walls.<br><br>(3) For safety reasons, some type of fencing shall be installed along the banks. If chain-link type of fencing is used, aesthetic treatment would be needed, including planting of vines to reduce impacts. | (1) Short-term impact would be same as Alternative 12.<br><br>(2) Long-term: Compared to existing conditions, the creek course would be wider. More vegetation could be planted on stepped walls. This alternative would have a more pleasing visual appearance compared to existing conditions.<br><br>Aesthetic treatment would be provided to the vertical walls. Project construction would be performed along oxbow; therefore, meandering course of the creek would be slightly altered.<br>(3) Fencing impacts would be same as alternative No. 12. | (1) Short-term impacts would be same as Alternative No. 12<br>(2) Long-term: The current creek bank protection consists of various types ranging from vertical walls to gabions, sand bags etc. Compared to the existing banks, conditions would be improved; however, the creek banks would not have a natural look. With vertical walls, the creek aesthetics would be altered like a man made concrete channel. To minimize impacts, aesthetic treatments would be applied to the vertical walls. Project would pass through oxbow; therefore, meandering course of the creek would be slightly altered.<br>(3) Fencing installation impacts would be same as Alternative No. 12. | **Alt. No. 12**: Upper banks will be planted with the natural vegetation. Create pocket parks. To enhance environmental value, construction of wetland near oxbow area would be performed.<br>**Vertical Walls**: Plant vines along the vertical walls to minimize impacts; cover concrete with natural color and texture, subject to input by ABR, HLC and PC.<br>If fencing is installed in the project design for safety purposes, plant vines along fencing to minimize impacts. Upgraded fence materials shall be used in areas visible or accessible to the public.<br>**Alt. No. 6**: Stepped Walls: Appropriate aesthetic treatment would be incorporated in the project plan to minimize project related impacts. Stepped walls would be vegetated to enhance the visual value of the creek.<br>Mitigation measures for vertical walls and fencing would be the same as Alt. No. 12.<br>**Alt. No. 8**: Mitigation measures identified in Alt. No 12 to minimize impacts related to the vertical walls and fencing would be applicable to this alternative. | Type of wall treatments or selection of vines need to be coordinated with the City and County of Santa Barbara.and biologists. |

**TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA**
**(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)**

| Resource | Alt. No-1 No Action | Alt. No-12 | Alt. No-6 | Alt.-No-8 | Mitigation | Comments/ Recommendation |
|---|---|---|---|---|---|---|
| Recreation | No change in existing conditions. Area residents would continue informal use of creek as recreational corridor by walking or playing in creek. | Short-term: During construction, stock piled material, equipment etc. will restrict recreational use of the creek. However, all sections would not be constructed at the same time; therefore, this impact is temporary and not significant.<br>Long-term impacts: This alternative provides maximum recreational opportunity compared to other alternatives. These opportunities includes: bird watching, walking along the creek bank, enjoying natural vegetation planted on upper slope of the creek. However, access to the creek bottom will be restricted and the creek's limited use as a connective corridor may be lost. | Short-term impacts would be same as Alt. No. 12.<br>Long-term Impacts: Partially vegetated walls will provide bird watching and walking type of activities. Like Alt. 12 public would not have access to the creek bottom; therefore, creek's use as a connective corridor may be lost. | Short-term: Same as Alt. 12.<br>Long-term: It would reduce opportunity for bird-watching because this alternative provides less opportunity for vegetation planting. Access to the creek bottom will be restricted and the creek's use as a connective corridor will be lost. | Alt. 12: Planting of native and riparian type of vegetation along the upper slope of the creek banks and within open areas. Create pocket parks and construction of wetland at oxbow. Viewing areas trash cans and setting at bridges, as approved by the City.<br>Alt. 6: Planting of natural riparian vegetation along stepped-walls, which would allow increased opportunity for bird watching. Provide maximum access to the residents for recreation use. Small parks shall be created from properties razed to accommodate conveyance designs. Alt. 6 impacts would remain significant and unavoidable.<br>Cost: Planting of native and riparian vegetation is included in the biological resource. Construction of creation of pocket parks and wetland is also included in biological resources.<br>Approximately 3% of the project cost is allocated for aesthetic treatment, including treatment to vertical wall surface treatment and improved fencing.<br>City will pay for bridge replacement and enhancements. | |

TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA
(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)

| Resource | Alt. No-1 No Action | Alt. No-12 | Alt. No-6 | Alt.-No-8 | Mitigation | Comments/ Recommendations |
|---|---|---|---|---|---|---|
| HTRW 1 | No Impacts. The two HTRW sites in the project area would continue to be contaminated until such time as clean-up is completed. | Two HTRW sites are located within the project reach, at 324 De la Vina and 220 W. Gutierrez Streets. The De la Vina property was used by former dry-cleaning establishment.<br>Testing of sediments would be required at West Gutierrez Street.<br>Sediment contamination by construction equipment-related leaks or spills of fuels, solvents, or lubricants; possibility of encountering PCE contaminated soil and/or shallow groundwater in the vicinity of the West Gutierrez Street Bridge. This event could potentially cause releases of this substance to the environment; and, possibility of encountering deep sediment contaminated by HTRW. | Same as Alt. 12 | Same as Alt. 12 | Equipment shall be in proper condition; no gasoline or oil change shalld occur in the creek bed.<br>Prior to construction, samples of creek sediments will be analyzed to determine contamination. Plan will be developed in coordination with the regulatory agencies (RWQCB, County Department of Environmental Health Services).<br>If sufficient information is available, a work plan shail be developed to determine characterization of the plume and impact to the shallow groundwater and sediment. | The RWQCB Region is aware of this problem and is working on resolution of this issue. This issue is not resolved yet. Currently, the property is owned by Caltrans.<br>Attorney representing property owner at 220 West Gutierrez Street is reportedly attempting to involve Caltrans in sharing the cost of remediation of the PCE plume. If the issue is not resolved, the construction at this location may be delayed. |

**Hazardous Toxic and Radioactive Wast (HTRW)**

**TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA**
**(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)**

| **Resource** | **Alt. No-1 No Action** | **Alt. No-12** | **Alt. No-6** | **Alt.-No-8** | **Mitigation** | Comments/ Recommendations |
|---|---|---|---|---|---|---|
| Traffic | No Impact | Short-term/Long-term: During project construction and future sediment removal, some residents may not have direct access to their residences. Street closure would be required in some locations. This impact is a short-term, temporary increase in truck traffic along selected haul routes. Particular concerns would arise during the replacement of the De la Vina/ Haley Street bridge which would impact a major commuter route on Haley Street. | Same as Alt. 12 | Same as Alt. 12 | Project construction would be performed by sections. No access to the residents or commercial establishment would be eliminated. Appropriate detours and traffic control officers would be provided to direct traffic. Alternative routes shall be coordinated with the City of Santa Barbara.<br><br>Cost is dependent upon number of traffic control staff needed. If city or county provide manpower, than there should be no costs. At each construction site (sector), a minimum of two traffic inspectors would be required. | |

TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA
(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)

| Resource | Alt. No-1 No Action | Alt. No-12 | Alt. No-6 | Alt.-No-8 | Mitigation | Comments/ Recommendations |
|---|---|---|---|---|---|---|
| Safety | The City of Santa Barbara would have continuing threat of flooding. | Short-term Impacts: During construction, truck traffic will increase, potentially causing accidents.<br>Long-term Impacts: After completion of the project, it could be possible that people could enter the creek bed and injured.<br>In addition, people may get into by-pass tunnel and criminals may live and hide in culvert. | Same as Alt. 12 | Same as Alt. 12 | Short-term Impacts: During construction, traffic control officers would be provided to divert traffic to minimize accidents.<br><br>Long-term Impacts: Fencing or other type of the protection shall be provided for public safety. Access points shall be provided to facilitate safe rescue.<br><br>Install bars at end of tunnel to restrict passage to people (applicable to oxbow bypass Alts)<br><br>Costs: Fencing costs would be included in project design. Traffic control officers would be provided to divert traffic to minimize accidents | Project would provide flood control protection to property located within the flood plain and safety to the residents living along the creek bank. |

**TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA**
**(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)**

| **Resource** | **Alt. No-1 No Action** | **Alt. No-12** | **Alt. No-6** | **Alt.-No-8** | **Mitigation** | Comments/ Recommendations |
|---|---|---|---|---|---|---|
| Cultural Resources | No Impacts | No historic structures will be impacted under NEPA:<br><br>Additional structures impacted under CEQA:<br>A. 15 W. Mason St. - Proposed for removal.<br>B. Potter Hotel Footbridge - Proposed for removal.<br>C. 134 Chapala St. - Proposed for partial removal.<br>D. 434 De la Vina St. - Proposed for removal.<br>E. 306 W. Ortega St. - Proposed for removal.<br>F. 536 Bath St. - Proposed for removal.<br>G. 116 Chapala St. Proposed for removal<br>H. West Downtown Neighborhood - Loss of buildings that contribute to potential status.<br>I. Waterfront Neighborhood - Loss of structures that contribute to potential status. | Same as Alt 12, w/o buildings 7-9. | Same as Alt. 6 | No mitigation measures are required under NEPA.<br>Mitigation Under CEQA:<br>1. Extend box culvert downstream of Chapala Street Bridge.<br>2. Same as #1. Depending on design, may not mitigate to less than significant.<br>A. HABS recordation. Significant unavoidable impact.<br>B. See #1. HAER recordation & relocation would result in significant unavoidable impacts. Preservation in place would fully mitigate impacts.<br>C. HABS recordation, photographic study & short history.<br>D. Same as C.<br>E. Begin vertical wall further upstream or otherwise redesign to avoid house. Also acceptable, HABS recordation & relocation on-site<br>F. Realign proposed channel or relocate house on-site.<br>G. Relocate on-site. If not feasible, relocate off-site & complete biography of Karl Obert. Relocation off-site results in significant unavoidable impacts. Further review shows this structure will not be impacted.<br>H. & I. Save buildings on-site. Complete survey to determine boundaries and contributing elements.<br>Also, conserve any sandstone removed throughout project reach. Sandstone may be used to provide caps or for other project-related purposes. Any remaining stone shall be held by the City for use in other City projects..<br>In the event of a project redesign, the USACOE will pay the mitigation costs for the structure s and buildings that are eligible for the National Register. Costs of structures eligible for State or Local Register will be paid by the City or Local Sponsor. | If the Sandstone Diversion, or the Chapala St. Bridge are affected as a result of final design, mitigation may also include reuse of sandstone blocks from the retaining wall. They could be used in other locations or to rebuild the new expanded channel. Every attempt will be made to reuse structural elements from dismantled historic properties to adhere as closely as possible to the City's General Mitigation measures will be specified in an MOA. |

TABLE 3.6-1 (CONTINUED) - LOWER MISSION CREEK FLOOD CONTROL PROJECT-SANTA BARBARA, CALIFORNIA
(SUMMARY OF IMPACTS, MITIGATION BY ALTERNATIVES ANALYZED FOR ENVIRONMENTAL EVALUATION)

| Resource | Alt. No-1 No Action | Alt. No-12 | Alt. No-6 | Alt.-No-8 | Mitigation | Comments/ Recommendations |
|---|---|---|---|---|---|---|
| Utilities | No Impacts | Water, sewer and telephone lines are located within the project reach. Relocation of these utility lines would be required. Residents may experience temporary loss of services for short periods. | Same as Alt. 12 | Same as Alt. 12 | Relocation of utility lines would be performed in such a manner as to minimize disruption in service and accidental spills. If there is disruption, property owners and tenants will be notified in advance. | |

# SECTION - 4 - PLANS AND POLICIES

This Section discusses the project's consistency or inconsistency with City and State plans and policies. This analysis was also used to assist in the preparation of the Coastal Consistency Determination required by the federal Coastal Zone Management Act (See Section 11, Land Use).

The following narrative provides a summary discussion and evaluation of the relevant plans and policies that guide development in the project area. Goals and Policies are presented in italics and are followed by a determination of the project's potential consistency with the quoted goal or policy. A final determination of consistency will be made by the Santa Barbara City Council; therefore, the reader is cautioned that the discussion is intended to serve only as a preliminary interpretation of consistency or inconsistency.

## 4.1 LOCAL PLANS AND POLICIES:

The following narrative provides a discussion of relevant City plans and policies that guide land use, creek protection, flood control and circulation that might affect this project.

### 4.1.1 Santa Barbara City Charter:

The City of Santa Barbara is a Charter City which means that, instead of following all of the general rules established by the State for cities, the City has elected to establish its own set of rules to the degree allowed by State law. The Charter was established by a public vote. Amendments to the Charter are also subject to approval by a vote of the citizens of Santa Barbara. A brief discussion of the pertinent Charter Sections follows.

#### 4.1.1.1 Charter Section 1507

On November 2, 1982, voters in the City of Santa Barbara approved Measure K which later became Section 1507 of the City Charter. This section states:

> *"It is hereby declared to be the policy of the City that its land development shall not exceed its public services and physical and natural resources. These include, but are not limited to, water, air quality, wastewater treatment capacity,*

*and traffic and transportation capacity. All land use policies shall provide for a level and balance of residential and commercial development which will effectively utilize, but will not exhaust, the City's resources in the foreseeable future. In making land use decisions, the City shall be guided by the policies set forth in this section. In furtherance of these policies, no amendments to the City's General Plan and Zoning Ordinance shall be effective unless approved by five (5) affirmative votes of the City Council. Upon such approval, General Plan and Zoning Ordinance amendments shall be conclusively presumed to comply with the policies set forth herein."*

This project is potentially consistent with Charter Section 1507 because it does not result in a significant impact on City resources.

#### 4.1.1.2 **Charter Section 1508**

This Charter Section was approved by the voters as Measure E on November 7, 1989, and amended in November 1996. The Section limits the amount of nonresidential square footage that can be constructed in the City until January 1, 2010. Because this project does not involve any increase in habitable non-residential square footage, it is potentially consistent with Charter Section 1508. If any non-residential square footage (i.e., 15 West Mason Street) is demolished as a result of this project, it can be reused on-site of adequate area is available or transferred to another site as Government Displacement square footage.

### 4.1.2 **Santa Barbara Municipal Code**

The Santa Barbara Municipal Code comprises all of the local laws that the City of Santa Barbara has adopted to regulate activities within its boundaries. Only two areas of the Municipal Code have direct application to the Lower Mission Creek Flood Control Project. Chapter 22.24, Flood Plain Management, applies to all areas in the City designated as Special Flood Hazard Areas and any new structures proposed in those areas. Although the Lower Mission Creek Flood Control Project is within the hazard area, it is not considered to be a structure as defined in this Chapter. A structure is defined as "a walled and roofed building, including a gas or liquid storage tank that is principally above ground, as well as a manufactured home." The flood control project is not walled and roofed.

Section 28.87.250, Development Along Creeks, applies specifically to Mission Creek.

This section requires that all new development be set back a minimum of 25 feet from the top of the bank of the creek. Subsection 28.87.250.1 states as follows:

*The purpose of this Section is to provide controls on development adjacent to the bed of Mission Creek within the City of Santa Barbara. These controls are necessary:*

*a. to prevent undue damage or destruction of developments by flood waters;*

*b. to prevent development on one parcel from causing undue detrimental impact on adjacent or downstream properties in the event of flood waters;*

*c. to protect the public health, safety and welfare.*

No development is allowed within the setback area unless it is found to be consistent with the above-stated purposes. This project will result in a reduction in damage or destruction by flood waters, will reduce the potential for development on one parcel to cause undue detrimental impact on adjacent or downstream properties, and it will improve protection of the public health, safety and welfare. On that basis, the project is determined to be potentially consistent with this ordinance section. There will be existing buildings that are within 25 feet of the new top of bank for the widened creek. There are presently 51 structures within 25 feet of the existing top of bank in the project reach. When the project is completed, there will be 50 structures within 25 feet, of the top of the widened creek, a reduction of one (1) structure. Because the project will result in a reduction in the number of buildings within 25 feet of the creek bank, it is considered to be potentially consistent with this provision.

## 4.2 SANTA BARBARA GENERAL PLAN:

The City's adopted General Plan is required by State law and contains a number of Elements that specify policies which relate to the proposed project. A brief discussion of applicable policies is provided below.

The reader should be aware of the fact that the Local Coastal Plan supercedes and refines the General Plan for those areas of the City which lie within the Coastal Zone. Where elements of the General Plan do not specifically refer to this type of project, the reader should consider the

language of the Local Coastal Plan as providing additional specificity and policy direction. See Section 4.3 for further discussion of Local Coastal Plan goals and policies.

### 4.2.1 **Land Use Element:**

The Land Use Element defines the existing and future layout of development in the City. There are two sections of the Land Use Element: the Land Use (or General Plan) Map and the text. The Map shows Land Use Designations for the City; the text discusses what these designations mean in more detail and often includes discussion of differences in emphasis for areas with the same designation in different areas of the City.

The land use designations are discussed in Section 11.1.4. The project is potentially consistent with the Land Use Map designation because it will still be a creek. However, please see discussions below for further consideration of what different General Plan Elements require for creeks in the City.

In terms of the Land Use Element text, Principle #8 states that:

> *"It is essential to protect the historic, architectural, and natural qualities of Santa Barbara's environment and to preserve the ecological balance of all life systems with which we coexist."*

Alternative 12, as mitigated, would be potentially consistent with most of this principle because it would restore and enhance the natural qualities of Mission Creek. In addition, the bridge designs would be consistent with Architectural Board of Review and Historic Landmarks Commission Design Guidelines, there would be habitat restoration included as part of the project and the creek alignment would be adjusted to protect most historic buildings and structures. It should be noted that one (1) City Structure of Merit at 15 West Mason Street, a portion of 134 Chapala Street, which is eligible for designation as a Structure of Merit and 434 De la Vina Street, which is also eligible for Structure of Merit designation, would be removed under all three construction alternatives under consideration. However, the City of Santa Barbara Historic Landmarks Commission agrees with the findings of the Architectural Survey (*Post/Hazeltine, 1999*). The findings indicate that, in order to protect these particular buildings it would be necessary to remove other, more significant, structures. Because Alternative 12, as originally designed, would have significant unavoidable impacts on the Chapala Street Bridge and the Potter Hotel Footbridge, it would be potentially inconsistent with this principle. However, if, as

proposed to mitigate impacts on historic resources, the box culvert were extended below the Chapala Street Bridge and both the bridge and the footbridge remain *in situ*, the project would also be potentially consistent with the historic portion of this principle.

Alternatives 6 and 8 would be potentially inconsistent with this principle because lost habitat would be inadequately replaced and up to 15 historic structures would be removed without the required consideration for either realigning the creek or relocating the structures.

Alternative 6 would be the least consistent with this principle because it would not protect the Mission Creek Diversion.

Goal #5 is to:

> *"Maintain the unique desirability of Santa Barbara as a place to live, work and visit."*

Alternative 12 would include requirements for aesthetic treatment of the creek banks, would improve the appearance of the creek in areas visible to the public (as well as in other areas) and would return the creek to a more natural appearance. Thus, Alternative 12 would be potentially consistent with this goal.

Channelizing Mission Creek under Alternatives 6 and 8, especially in areas where it is visible to the public (local or visitor), would be potentially inconsistent with this goal unless a solution to their visual and aesthetic impacts can be devised.

### 4.2.2 **Noise Element:**

The Noise Element focuses on the noise environment in the City. It points out problem areas and sets goals for maintaining and enhancing good noise conditions and improving areas with noise problems. The goal of the Noise Element is *"to ensure that the City of Santa Barbara is free from excessive noise and abusive sounds."* The maximum exterior noise levels allowed by the Noise Element are based on the sensitivity of different uses. The maximum exterior noise level allowed for residential use is 60 dB(A) CNEL. The maximum exterior noise level allowed for hotel and motel use is 70 dB(A) CNEL and the maximum allowed for most other commercial uses is 75 dB(A) CNEL. Existing ambient noise levels in the project area range from less than 60 dB(A) CNEL to 70 dB(A) CNEL. During construction of the channel, construction-related noise would range from 80 to 89dB(A). However, construction would be likely to affect a particular area of the project for only a few days at a time as construction moves down the creek. The Noise Element focuses primarily on long term noise concerns. However, Policy 6.0 of the Noise Element points out that "*noise control activities should be coordinated with those of other responsible jurisdictions.*" This encourages the City, the District and the Corps to coordinate in reducing noise impacts during construction of the channel. The mitigation measures proposed to reduce construction noise would minimize the potential noise impacts of the construction project and call for coordination of construction with requirements in the City's Noise Ordinance. Thus, construction noise, as mitigated, would be potentially consistent with the Noise Element. Once channelization is completed, the noise levels will return to their ambient conditions; therefore, the project would be potentially consistent with the Noise Element in the long term.

### 4.2.3 **Conservation Element:**

Policies related to water, air, cultural, biological and visual resources are incorporated into the Conservation Element. Those goals and policies that relate to this project are considered and discussed below. The Conservation Element specifically states that consistency is based on Goals and Policies, not on the Implementation Strategies. The Implementation Strategies have been incorporated for information purposes only.

### 4.2.3.1 **Cultural and Historic Resources**

***Cultural and Historical Resources Goal***

*Sites of significant archaeological, historic, or architectural resources will be preserved and protected wherever feasible in order that historic and prehistoric resources will be preserved.*

***Cultural and Historic Resources Policies***

*1.0 Activities and development which could damage or destroy archaeological, historic, or architectural resources are to be avoided.*

As outlined in the Cultural Resources discussion in this document (Section 18), the various project alternatives would result in impacts on archaeological sites which can be mitigated to an acceptable level. For archaeological resources, the project is potentially consistent with this policy.

There are several historic buildings that are in the project's Area of Potential Effect, as outlined in Chapter 18. These include the following resources, eligible for the National Register of Historic Places, the California Register of Historic Resources and/or City of Santa Barbara Landmark or Structure of Merit:

15 West Mason Street
20 West Mason Street
101 State Street (floor only)
116 Chapala Street
118 Chapala Street
120 Chapala Street
134 Chapala Street
Chapala Street Bridge
Potter Hotel Footbridge
Mission Creek Diversion
Moreton Bay Fig Tree
434 De la Vina Street

536 Bath Street
308 West Ortega Street

Of the above historic resources, 15 West Mason Street and 434 De la Vina Street cannot be avoided by the project design and would be removed. It is also likely that a portion of 134 Chapala Street would be removed. In the case of the buildings at 434 De la Vina Street and 134 Chapala Street, the impacts of their loss would be mitigated through substantial recordation requirements. The structure at 15 West Mason Street poses a different issue. The Post/Hazeltine Associates (PHA) report prepared on these architectural resources states:

> *"demolition of 15 West Mason Street will allow for an alternative realignment of Mission Creek that would preserve the integrity of the 100 block of Chapala Street and the house at 20 West Mason Street. Preservation of these other resources preserve(s) a more significant part of Santa Barbara's architectural and historical integrity."*

Project changes that would protect 15 West Mason Street would likely result in the loss of 116, 118 and 120 Chapala Street and 20 West Mason Street. The effects on the other historic resources can be mitigated by project redesign, including minor changes in alignment and extension of the box culvert downstream of the Chapala Street Bridge. Given the impacts that would occur if 15 West Mason Street were protected and the importance of the structures on Chapala Street and at 20 West Mason Street, Alternative 12 would be potentially consistent with this policy.

Alternative 8 is very similar to Alternative 12 in its effect on historic resources. Assuming that the same mitigation measures were imposed, it would be potentially consistent with this policy.

Finally, the Moreton Bay Fig Tree, at the corner of Montecito and Chapala Streets, is a designated City Landmark and is also recognized as one of the largest trees of its type in North America. The Biological Resources Section concludes that there will be no impacts on the Tree as a result of construction of any of the project alternatives.

### 4.2.3.2 **Visual Resources**

***Visual Resources Goals***

*Restore where feasible, maintain, enhance and manage the creekside environments within the City as visual amenities, where consistent with sound flood control management and soil conservation techniques.*

*Protect and enhance the scenic character of the City.*

*Maintain the scenic character of the City by preventing unnecessary removal of significant trees and encouraging cultivation of new trees.*

*Protect significant open space areas from the type of development which would degrade the City's visual resources.*

***Visual Resources Policies and Implementation Strategies***

*1.0 Development adjacent to creeks shall not degrade the creeks or their riparian environments.*

*1.1 Setbacks, as required by the Federal Flood Insurance Program, should be enforced (see Drainage and Flooding section).*

*1.2 Examine undeveloped parcels having creek frontage for possible purchase and retention as open space.*

*1.3 Developments which require retaining walls or other topographic modifications of the creekside environment should not be permitted unless consistent with sound flood control management and soil conservation techniques.*

*1.4 Develop a creek beautification ordinance.*

*4.0 Trees enhance the general appearance of the City's landscape and should be preserved and protected.*

*4.1 Mature trees should be integrated into project design rather than removed. The Tree Ordinance should be reviewed to ensure adequate provision for review of protection measures proposed for the preservation of trees in the project design.*

*4.2 All feasible options should be exhausted prior to the removal of trees.*

*4.3 Major trees removed as a result of development or other property improvement shall be replaced by specimen trees on a minimum one-for-one basis.*

*5.0 Significant open space areas should be protected to preserve the City's visual resources from degradation.*

*5.1 The City should consider purchase or the obtainment of development rights of significant open space where no other means can be found to protect visual resources from degradation.*

The loss of skyline trees that would result from construction of any of the alternatives is potentially inconsistent with Visual Resources Policy 4.0 until such time as the replacement trees have grown enough to create a new skyline. However, if Alternative 12 were redesigned to save as many of the mature trees as feasible, especially native trees and skyline trees, whether native or non-native, Alternative 12 could be considered potentially consistent with Visual Resources Policy 4.0 in the long-term.

Alternative 12, which includes the greatest opportunity for habitat restoration incorporates establishment of native vegetation on the creek banks as well as on the slopes of those banks. Most of the vertical walls included in the design are short, would be colored and textured and would be hidden most of the time by overhanging vegetation planted on the slopes above. Full height vertical walls have been minimized. In addition, Alternative 12 would include habitat expansion zones that would serve the multiple purpose of providing additional habitat, improving visual quality and providing for open space for use by area residents. With the exception of concerns related to all project alternatives addressed below, Alternative 12 would be potentially consistent with these Visual Resources Goals and Policies.

Alternative 6 would be potentially inconsistent with these Visual Resources Goals and Policies because it would not maximize the potential to enhance the scenic character of the project area. The stepped walls would still appear, in many cases, to be a single vertical wall. Plant growth would be limited by the narrow planting areas between the upper and lower portions of the stepped walls. Lower Mission Creek is the only open space of any magnitude in

the West Downtown area; its loss without creation of pocket parks or other passive recreation would be potentially inconsistent with Visual Resources Policy 5.0.

Alternative 8, which would be designed entirely with vertical walls, would be potentially inconsistent with the Visual Resources Goals and Policies outlined above because such channelization would not look natural. In addition, it would not meet City goals to protect and enhance the natural environment. Santa Barbara's primary economic base is built on its visual appearance and beauty. A significant contribution to this appearance is the City's Waterfront. Mission Creek flows through this important area as well as along the edge of the Downtown area. If its appearance is not designed to be aesthetically pleasing, it would not enhance the scenic character of the City. Lower Mission Creek is the only open space of any magnitude in the West Downtown area; its loss without creation of pocket parks or other passive recreation would be potentially inconsistent with Visual Resources Policy 5.0.

A significant concern for all three project alternatives would be the type of fencing proposed along the creek banks. Chainlink fencing, which is typically used to keep people out of the creek, would be potentially inconsistent with the Visual Resources Goals and Policies. Where feasible, fencing should be eliminated and replaced with native plantings that would keep people out, such as wild rose and/or blackberries. In other locations, the use of decorative fencing or fencing that fades from view would be appropriate. If these mitigation measures are included in the project design, Alternative 12 would be potentially consistent with these Visual Resources Goals and Policies.

This project is not directly related to Visual Resources Policy 1.0 because the project involves the creek itself rather than development adjacent to the creek. However, the City of Santa Barbara will need to review adjacent development against this policy. It may also be necessary to reconsider the purpose of the 25-foot setback from the creek as required by the City Zoning Ordinance. The focus of this setback is presently based on flood protection only. The focus should be expanded to include habitat protection and buffer considerations. The City is pursuing Creek Strategic Planning for all City creeks, including Mission Creek. Part of this planning process will include reevaluation of existing creek policies and ordinance provisions.

### 4.2.3.3 **Air Quality**

***Air Quality Goal***

- *Maintain air quality above Federal and State ambient air quality standards.*

The proposed project alternatives are potentially consistent with this Air Quality goal because its implementation would not contribute to noncompliance with Federal and State air quality noncompliance for the short- or long-term.

### 4.2.3.4 **Biological Resources**

***Biological Resources Goal***

*Enhance and preserve the City's critical ecological resources in order to provide a high quality environment necessary to sustain the City's ecosystem.*

***Biological Resources Policies and Implementation Strategies***

*1.0 A set of land-use suitability guidelines shall be developed for use in land planning and the environmental review process.*

*1.3 Where not preempted by the Federal Flood Insurance Program, land-use regulations will be developed for the creek influence zones of Mission, Sycamore, San Roque, and Arroyo Burro Creeks.*

*a. Assign the task of conducting a biological study of the creek influence zones to the Community Development Department. This study is to determine the general land uses within the zone which would be compatible with the maintenance of the existing biologic communities of the creeks, and is not intended to consider the development of public recreation facilities within the creeks.*

*b. Enact a flood control and creek ordinance which would include provisions to restrict channelization in natural creek bottoms and structural developments within the 100-year floodplain in natural creek areas.*

*c. Conduct a feasibility study on the replacement of concrete bottoms of channelized creek sections with natural bottoms and/or the use of mitigation measures to increase the diversity of channelized creeks.*

*4.0 The habitats of rare and endangered species shall be preserved.*

*6.0 Intertidal and marine resources shall be maintained or enhanced.*

*10.0 Programs shall be developed to maintain a productive urban biotic community.*

Two of the three project alternatives would result in some net improvement to biological resources. All project alternatives would include removal of existing concrete bottom in the project reach. All three Alternatives would either be neutral or improve habitat for threatened and endangered species that occur within the project area. Alternative 8 would result in a reduction of biological resources and would, therefore, be potentially inconsistent with these policies.

Alternative 12 would include the greatest habitat improvements, resulting in an increase in habitat units. The reason for Alternative 12's greater habitat value is that there would be more complete stream bank habitat that could be established on the sloped rip-rap and also because of the creation of new habitat in five locations along the project reach.. Additional measures to protect the Tidewater goby and Steelhead trout would further improve habitat values. Alternative 12 would be potentially consistent with the Conservation Element Biological Resources goals and policies.

Even with Alternative 12, however, there would be some concern that there would be an inadequate buffer for habitat purposes at the top of the bank. Although Biological Resources Implementation Strategy 1.3a calls for the establishment of appropriate uses within the creek influence zone necessary to protect biological resources, the only protection in the area is a 25 foot wide buffer established primarily for flood control purposes. See additional discussion of this issue under the Local Coastal Plan.

Alternative 6 may also be potentially consistent with these Biological Resource policies because there is a net increase in habitat units. However, that increase is not as great as with

Alternative 12. Alternative 8 results in a net loss of habitat; therefore, it is potentially inconsistent with these policies.

### 4.2.3.5 **Drainage and Flood Control**

***Drainage and Flood Control Goals***

*Insure that human habitation of the City's floodplains does not adversely affect public health, safety, and welfare.*

*Encourage recreation, conservation and open space uses in floodplains.*

*Provide Federal Flood Insurance for structures already in flood hazard zones.*

***Drainage and Flood Control Policies and Implementation Strategies***

*1.0 The City shall participate in the Federal Flood Insurance Program so that property owners may receive disaster assistance.*

*2.0 Floodplain management programs shall be implemented through the Building Officer of the Division of Land Use Controls, and the Flood Control Division [of the Public Works Department].*

*3.0 Hazard reduction programs shall be implemented in urban sections of the City already built in hazardous flood-prone areas.*

*4.0 Goals and policies of this element are interrelated with those of the Safety and Open Space Elements and shall be considered together in land use planning decisions.*

*4.1 Encourage the use of natural building materials for flood control channels such as stone, heavy timber, erosion control, shrubs, and wire revetment with plantings of native or naturalized flora wherever they provide a comparable degree of flood protection.*

*4.2 Creeks and their banks constitute a scenic open space resource within the City in their natural state; thus, the Open Space Element also recognizes the importance of keeping structures out of the stream channels*

*for preservation of City resources.*

*4.3 The Safety Element recognizes the hazard to lives and property of encroachment of structures into stream channels and on stream banks; thus, it also supports the findings of this Element on the basis of hazard reduction.*

Alternative 12 would use a more natural approach to its design, which would allow native vegetation within the creek banks while providing improved flood protection. Therefore, Alternative 12 would be potentially consistent with these goals and policies. It should be noted that, through the Division of Land Use Controls and the County Flood Control District, the City has implemented those goals and policies which require participation in the Federal Flood Insurance Program.

Project Alternatives 6 and 8 would be potentially inconsistent with these Drainage and Flood Control goals and policies because the channelization of lower Mission Creek would result in the loss of opportunity for recreation, conservation and open space uses in the flood plain.

4.2.3.6 **Water Resources**

***Water Resources Goal***

*To maintain existing and protect future potential water resources of the City of Santa Barbara.*

*Water Resources Policy*

*3.0 Implement monitoring program of groundwater resources in the Santa Barbara basin.*

With the use of a natural bottom, all project alternatives would be potentially consistent with this goal and policy because there would be no adverse effects on groundwater recharge.

### 4.2.4 **Parks and Recreation Element:**

The Parks and Recreation Element focuses on the provision of adequate park space and recreation facilities for residents of and visitors to the City. The Parks and Recreation includes a discussion of the placement of neighborhood parks along major drainage channels:

> *Many of the existing Neighborhood Parks are along major drainage channels. Every opportunity to utilize these wooded drainage channels for park purposes should be taken. In the Wilson area, for example, such a location represents the best available opportunity for the provision of park facilities.*
>
> *In the medium- and high-density residential areas, the Neighborhood Park facilities should be supplemented by small, passive landscaped parks oriented to the older citizen. These can be quite small, providing no more than benches in addition to the landscaping. De La Guerra Plaza is a good example of this level of facility.*

The five to six habitat expansion areas proposed as part of the project provide an opportunity to create passive park spaces in one or more of the areas. The best opportunities would occur at the corner of Bath and Ortega Streets and on De la Vina Street, south of Gutierrez Street. At a minimum, interpretive signing, benches and trash cans would be provided. Pathways may also be appropriate. It may also be possible, as a separate project, to acquire additional property to create a tot lot. This project is potentially consistent with this discussion.

Regarding the Moreton Bay Fig Tree at Chapala and Montecito Streets, the Parks and Recreation Element refers to this area as a Special Use Area and states:

> *"The Moreton Bay Fig Tree is a major landmark in the City. The park area surrounding this unique specimen should ultimately be expanded to provide an appropriate setting and protection. The General Plan proposes that the crosstown freeway design provide an appropriate setting and protection. The General Plan proposes that the crosstown freeway provide for grade separations at State Street, but not at Chapala Street. It is recommended that Chapala Street be terminated at points above the freeway and below the railroad tracks so that*
>
> *additional land can be devoted to the park area around the Moreton Bay Fig Tree."*

It has been determined in the Biological Resources Impact section that those alternatives

that include the oxbow bypass culvert would not impact the Fig Tree. In addition, the proposed channelization would not impact the ability of the City to terminate Chapala Street and create additional park area around the Fig Tree and would thus be potentially consistent with the discussion.

Finally, the Parks and Recreation Element includes a discussion of riding and hiking trails:

> *The primary objective of a trail system should be the provision of trails leading from the residential areas of town up to the foothills and down to the beaches. The major drainage channels shown on the General Plan provide the best locations to accomplish this. Those shown are Arroyo Burro Creek, Mission Creek, Sycamore Creek, and Cold Springs Creek. Efforts should be made to set these natural areas aside not only for the trails and the important recreational activity which they provide, but also for the preservation of the natural open space as a diversified factor in the urban scene. The modern techniques of channeling these drainage areas into a uniform and sterile concrete trough should be avoided. This intensity of urbanization is not characteristic of [the] Santa Barbara environment.*

While the Parks and Recreation Element encourages the inclusion of riding and hiking trails along the major creeks, it does not require such trails. The City of Santa Barbara intends to continue exploration of appropriate opportunities to create trails in the future, especially in the Waterfront area and in the more natural part of the creek, above Outer State Street. The design of the proposed project avoids the appearance of "a uniform and sterile concrete trough." While the present creek has little natural open space to preserve, this project will provide for enhancement of the creek through the provision of a buffer of native trees and plants consistent with the riparian environment. See the Conservation Element Visual Resources Policies for additional discussion. The project is potentially consistent with this discussion.

4.2.5 **Open Space Element:**

The primary purpose and goal of the Open Space Element are:

> *"To protect the character of Santa Barbara . . . by conserving and providing significant open and natural landforms through and around the community."*

*"There are many overlaps between open space and other community features which share the goal of conserving the Santa Barbara character. The protection of mature trees on private property, the landscaping of major developments, the policies on architectural sign control, and many other subjects in the General Plan serve a function parallel with that of open space. Only those segments of open space meeting the criteria of Citywide significance are discussed here."*

The Open Space Element discusses Creek issues as follows:

*"The major drainage channels which passes through the City are San Roque, Arroyo Burro, Mission Canyon [sic], and Sycamore Creeks. These drainage channels should remain in their natural state, providing recreation facilities as proposed in the Parks and Recreation section as well as open space corridors through the community. It is recognized that certain maintenance, clearing, and alignment work may have to be done in order to minimize flood damage. However, all such flood control work should be done in a manner that will maintain the natural qualities of the creek open space. Further artificial channelization and/or lining, in any form, must not occur."*

*"Implementation of the creek open space category involves the City's establishment of firm policies to preserve these channels in their natural state. These policies must be enforced by the City, the County Flood Control District, and the Army Corps of Engineers. The acquisition of rights-of-way for trails, while important to the recreation system, is not essential to the protection of these corridors for open space purposes. Special regulations for development adjacent to the major creeks should be enacted to prevent construction in creek open space areas and to protect development from known flood hazards. While much of the land adjacent to these creeks is already developed, most will be redeveloped. New construction should respect the creeks as important community open space."*

The loss of skyline trees that would result from construction of any of the alternatives would be potentially inconsistent with discussion until such time as the replacement trees have grown enough to create a new skyline. Another significant concern for all project alternatives would be the type of fencing proposed along the creek banks. Chainlink fencing, which is typically used to keep people out of the creek would be potentially inconsistent with the Open

Space Element and its emphasis on a natural appearance. Where feasible, fencing should be eliminated and replaced with native plantings that would keep people out, such as wild rose and/or blackberries. In other locations, the use of decorative fencing or fencing that fades from view would be appropriate.

Alternative 12, which would include the greatest opportunity for habitat restoration, would incorporate establishment of native vegetation on the creek banks as well as on the slopes of those banks. Most of the vertical walls included in the design would be short, would be colored and textured and would be hidden most of the time by overhanging vegetation planted on the slopes above. In addition, Alternative 12 would include habitat expansion zones which would serve the multiple purpose of providing additional habitat, improving visual quality and providing for open space for use by area residents. Alternative 12 would be potentially consistent with goals of the Open Space Element.

Alternative 6 would be potentially inconsistent with the Open Space Element because it would not maximize the potential to enhance the scenic character of the project area. The stepped walls would still appear, in many cases, to be a single vertical wall. Plant growth would be limited by the narrow planting areas between the upper and lower portions of the stepped walls. Lower Mission Creek is the only open space of any magnitude in the West Downtown area; its loss without creation of pocket parks or other passive recreation would be potentially inconsistent with the Open Space Element.

Alternative 8, which is designed entirely with vertical walls, would be potentially inconsistent with the Open Space Element discussion outlined above because such channelization would not look natural. In addition, this alternative would not meet City goals to protect and enhance the natural environment. Finally, lower Mission Creek is the only open space of any magnitude in the West Downtown area; its degradation would be potentially inconsistent with the Open Space Element.

### 4.2.6 **Seismic Safety and Safety Element:**

The Seismic Safety and Safety Element is focused on analyzing existing geologic, flood, earthquake related, fire and other life-threatening considerations and developing means of avoiding or preparing for disasters related to these concerns.

***Seismic Safety and Safety Goals:***

*To protect life, property and public well being from seismic and other geologic hazards.*

*To reduce or avoid adverse economic, social, and environmental impacts caused by geologic conditions.*

***Ground Shaking Policy***

*4. Require the design and construction of utility systems, and other facilities which need to remain operable after an earthquake, to be able to resist ground shaking forces.*

***Liquefaction Policy***

*1. Liquefaction evaluations and recommendations should be made by a qualified soils engineer for all new major or public structures located in high or conditional liquefaction areas (shown on the Liquefaction Hazard Map) whose failure could result in loss of life or high monetary loss.*

***Erosion Policy***

*2. Major construction projects in areas of active or high erosion potential shall be required to implement erosion and sediment control procedures during the construction phase of the project.*

All of the project alternatives would be required to complete pre-construction geotechnical studies to assure that they would be able to withstand ground shaking and liquefaction hazards. In addition, any of the wall types proposed would result in improvements to the erosion potential along the creek banks. Therefore, all three project alternatives would be potentially consistent with these policies.

***Flooding Policies***

*1. Establish and enforce adequate creek setbacks or buffer zones to protect new development from flood and erosion hazards.*

*2. Conduct "precise-alignment" studies along Mission and Arroyo Burro Creeks to determine the most efficient stream channel configuration and setback distances. Any improvements resulting from the studies should be reviewed as to consistency with the Conservation Element.*

*3. To assure the effectiveness and structural integrity of flood containment structures placed on private land, all such construction shall be subject to the approval of the Santa Barbara Flood County Control District.*

*4. Encourage light intensity use in the floodway or floodway fringe with the requirement that such uses shall not impair the flood-carrying capacity of the stream.*

The City has established setbacks along Mission Creek which require that new development be placed a minimum of twenty-five feet away from creek banks; however, much of the property along Mission Creek was developed long before the setbacks were established. In addition, within the flood zones, the City requires that new development be constructed such that finished floor elevations are above projected flood levels. All new construction is also subject to review and approval by the Santa Barbara County Flood Control District. In developing the design for flood control on Mission Creek, "precise-alignment" studies have been completed by the Army Corps of Engineers. The project design has taken these studies into account. Therefore, all three project alternatives would be potentially consistent with these policies. However, please review the Conservation Element policies for further discussion.

### 4.2.7 **Circulation Element:**

The Circulation Element is focused on providing for adequate transportation facilities for the amount of traffic (motorized vehicle, pedestrian, aircraft, bicycle, etc.) existing and projected in the City. The following Goals, Policies and Implementation Strategies have some relationship to this project:

*Goal 5 Increase Walking and Other Paths of Travel*

*Develop a comprehensive system of pedestrian routes which are integrated with other modes of transportation and which provide safe and efficient paths of travel.*

*Policies and Implementation Strategies*

*5.1 The City shall create an integrated pedestrian system within and between City neighborhoods, schools, recreational areas, commercial areas and places of interest.*

*5.1.1 Identify and link major activity centers and destinations with walkways. This will consist of the following:*

*surveying existing connections between neighborhoods and identifying opportunities and constraints for new pedestrian connections,*

*identifying existing barriers to walking to school and where feasible eliminating those barriers,*

*providing improved access for pedestrians (for example, between such areas as the Eastside, Westside, Mesa, Lower State, Upper State and Waterfront areas, major attractions, recreation, cultural, and commercial areas), ...*

*5.3 Protect and expand existing paseos and acquire new paseos in the Downtown.*

*5.3.1 Develop conceptual designs and guidelines for new paseos.*
*5.3.2 Establish protective mechanisms such as land acquisitions, historic designations, use of easements, private development cooperation, and development controls for the paseo system.*
*5.3.3 Encourage private development to incorporate public paseos by offering increased density and other incentives for providing or improving paseos and paseo connections.*
*5.3.4 Consider closing streets to create pedestrian plazas if, upon consultation with a broad segment of the community and general agreement of the affected business owners and property owners, it can be demonstrated that it would improve pedestrian access and enhance the Downtown business environment.*

*5.5 The City shall create and foster a pedestrian friendly environment through physical and cultural improvements and amenities.*

*5.5.1 Provide street furniture, especially benches for resting and shade trees along streets, where appropriate. Look for opportunities for new resting spots, plazas, placitas, small squares, and landscaped areas in all areas of the City which should include focal point(s), opportunities for people watching, and/or attractive natural surroundings. These areas will encourage gathering, public*

*and social interaction and could be used for cultural events and activities. An example could be the placement of benches and street furniture in Chase Palm Park.*

*5.5.2 Identify areas where additional street and paseo lighting is appropriate and implement methods to provide that lighting.*

*5.5.6 Look for opportunities to connect placitas to public, private and institutional uses. Include signage, as appropriate.*

***Goal 9 Develop Special Policies Related to Transportation and Parking in the Coastal Zone***

*Create a more consolidated parking system in the waterfront area and explore new and/or expanded opportunities for use of alternative transportation. In order to open up new areas for recreational use and to allow for better views from Cabrillo Boulevard, no further development of parking should occur on the ocean side of Cabrillo Boulevard, except in the developed harbor areas if consistent with the Harbor Master Plan.*

*9.1 The City shall encourage use of alternative modes of transportation, especially non-motorized options, in and around the Coastal Zone.*

*9.1.1 Improve pedestrian, bicycle, and transit access throughout the Coastal Zone. Improve access from the Wharf and Harbor areas to the La Playa (City College) lots, Waterfront, and State Street areas through such methods as:*

- *providing additional bicycle and pedestrian paths,*
- *working with transit providers to increase transit service,*
- *improving the existing beachway to increase safety for pedestrians, cyclists, skaters, and other forms of non-motorized travel,*
- *providing additional bicycle racks and/or lockers in public areas, including public parking lots,*
- *improving lighting along pedestrian routes to encourage pedestrian activity especially between Lower State Street, Stearns Wharf, the Harbor and the overnight tourist accommodations, and*
- *providing additional seating and resting spots in public areas for pedestrians.*

*9.1.3 Develop a paseo plan for the interior portions of the HRC-2 zone, especially along Helena and Anacapa Streets between Cabrillo Boulevard, and*

*Yanonali and State Streets to improve pedestrian circulation in the Waterfront area and attract visitors to the interior areas. See Chapter 5 for a description of paseos. Utilize dedication and develop paseos with landscaping and pedestrian amenities.*

All of the project alternatives have an opportunity to improve pedestrian access to Mission Creek. However, for the most part, these opportunities have not been taken. With the Circulation Element's emphasis on enhancing pedestrian opportunities in the various neighborhoods, all project alternatives are potentially inconsistent with the Circulation Element Goals and Policies outlined above. However, Alternative 12 includes habitat expansion areas, some of which have the potential for passive park space. Provision of pocket parks where parcel remnants are left and creation of attractive bridges, including seating areas, would encourage walking throughout the project area. In addition, the creation of a pedestrian walkway or paseo along the easterly bank of the creek between State Street and Yanonali Street would provide a new route between the Waterfront and the park that is being completed as part of the Railroad Depot restoration project. This would create an opportunity to bring residents and tourists to the rear of properties along the creek, opening the potential for restaurants and other activities overlooking Mission Creek. Alternative 12 is the only alternative that allows for consideration of park spaces or walkways.

### 4.2.8 **Housing Element:**

The Housing Element is focused on the maintenance and provision of adequate housing for residents of and workers in the City, especially for moderate and low income residents.

***Housing Element Policy***

*3.5 The City shall ensure that public projects requiring relocation plans under State or Federal relocation laws shall be coordinated and reviewed by the City. Affordable, decent, safe, and sanitary housing shall be available to those displaced within the City or within the South Coast area. Fair compensation and relocation assistance shall be available to those displaced.*

All project alternatives, except the no Action Alternative, would require the demolition and/or relocation of existing housing units along lower Mission Creek. The City will be responsible for relocating displaced residents in accordance with local, State and Federal laws.

The City will assure that fair compensation and relocation assistance will be available to those displaced by this project. Therefore, the project would be potentially consistent with this policy.

## 4.3 LOCAL COASTAL PLAN:

The Local Coastal Plan (LCP) applies to the coastal areas of the City. It is required by the California Coastal Act of 1976 and is based on the Coastal Initiative of 1972. Its primary purposes are to protect coastal resources, assure that coastal-dependent uses have a high priority in the coastal area and protect access to the California Coast by residents of and visitors to California.

Three general policies guide the LCP, as follows:

*1.1 The City adopts the policies of the Coastal Act (Public Resources Code Sections 30210 through 30263) as the guiding policies of the land use plan.*

*1.2 Where policies within the land use plan overlap, the policy which is the most protective of resources, i.e. land, water, air, etc., shall take precedence.*

*1.3 Where there are conflicts between the policies set forth in the land use plan and those set forth in any other element of the City's existing General Plan or existing regulations, the policies of the land use plan take precedence.*

A discussion of the policies of the California Coastal Act follows this discussion of the City LCP. Please review the policy areas outlined below for discussion of potential consistency or inconsistency.

### 4.3.1 Water and Marine Environments:

The following policies in the Water and Marine Environments Section of the LCP apply to this project:

*6.1 The City through ordinance, resolutions, and development controls shall protect, preserve, and where feasible restore the biotic communities designated in the City's Conservation Element of the General Plan and any future annexations to the City, consistent with PRC Section 30240.*

*6.6 Revetments, seawalls, bulkheads, groins, pipelines, outfalls and other necessary permitted construction shall be designed to eliminate or mitigate to the maximum extent adverse impacts on local shoreline sand supply.*

*6.8 The riparian resources, biological productivity, and water quality of the City's coastal zone creeks shall be maintained, preserved, enhanced, and where feasible, restored.*

*6.9 The City shall support the programs, plans, and policies of all governmental agencies, including those of the Regional Water Quality Control Board with respect to best management practices for Santa Barbara's watersheds and urban areas.*

Regarding Policies 6.1 and 6.8, the biotic communities discussed in the Conservation Element include riparian, wetland and estuarine habitats. All of these habitats would be affected by the proposed project. Two of the three project alternatives would result in some net improvement to biological resources. All project alternatives would include removal of existing concrete bottom in the project reach. All three Alternatives would either be neutral or improve habitat for threatened and endangered species that occur within the project area. Alternative 8 would result in a reduction of biological resources and would, therefore, be potentially inconsistent with these policies. Additional measures to protect the Tidewater goby and Steelhead trout would further improve habitat values. Alternative 12 would be potentially consistent with Policies 6.1 and 6.8.

Even with Alternative 12, however, there is some concern that there may be an inadequate buffer for habitat purposes at the top of the bank. Although Biological Resources Implementation Strategy 1.3.a calls for the establishment of appropriate uses within the creek influence zone necessary to protect biological resources, the only protection in the area is a 25-foot wide buffer for flood control purposes. However, the City of Santa Barbara has proposed establishing a non-profit nursery that would be used for restoration and mitigation programs along creeks. It would also be used to provide residents who live along the creeks with native trees and shrubs that would allow the expansion of the riparian buffer into private back yards.

All of the project alternatives would end at the upstream side of Cabrillo Boulevard bridge. The amount of silt, sand and other materials carried by Mission Creek would not

decrease. The project would not result in adverse impacts on the sand supply. Therefore, all three project alternatives would be potentially consistent with Policy 6.6.

The project would be required to meet all regulations of all governmental agencies, including the Regional Water Quality Control Board, regarding water quality. All three project alternatives would, therefore, be potentially consistent with Policy 6.9.

*6.11 Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) Necessary water supply projects, (2) Flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) Developments where the primary function is the improvement of fish and wildlife habitat.*

This project would constitute a substantial alteration of Mission Creek, as outlined in Policy 6.11 above. This policy echoes California Coastal Act Policy 30236, as well. As a flood control project, it is one of the three types of projects allowed by the two policies. Two questions related to this policy would then remain: 1) Does any project alternative "incorporate the best mitigation measures feasible?" and 2) Is "no other method for protecting existing structures in the flood plain" feasible and is it necessary for public safety or to protect existing development?

The second question is the easier of the two to answer. At the beginning of the Feasibility Study, the history of flooding on Mission Creek is outlined in some detail. It is clear from this review that some type of flood control project is necessary to promote public safety and protect existing development. In reviewing the alternatives considered, but not included in the EIS/R, it is also clear that other approaches to reducing flooding impacts were considered and found to be infeasible.

Alternative 12 (the Preferred Alternative) is projected to cost approximately $18 million (this includes revisions to reflect the gross appraisal of acquisition costs prepared for the City and changes to the project design to reduce land acquisition costs). An alternative that consists of a short vertical wall and vegetated riprap slope at 1.5:1 (H:V) above would require an additional 20 feet of width (10 feet on each side) to construct. An alternative that consists solely of vegetated riprap slope at 1.5:1 would require an additional 26 feet of width (13 feet on each side). Because

of the location of the existing structures in this area, it would be necessary to remove several structures or portions of such structures. Property acquisition and remodel of the remaining buildings alone is estimated to cost an additional $4 million. This assumes that instead of full take of the buildings involved, it would be possible to remove a portion of the building and remodel the remainder rather than completely demolish the structure. If it is infeasible to remodel the structure(s), costs could be even higher. In any case, because the benefit from the Corps standpoint would be substantially unchanged, but the costs would substantially increase, it would not be possible to meet the required cost:benefit standard. Therefore, a project alternative that includes riprap side slope for all or part of the length south of the freeway is infeasible.

In terms of adequate mitigation, Alternatives 6 and 8 probably would not adequately mitigate environmental impacts (in that they are not "the best mitigation measures") nor would they mitigate the effects on other coastal resources. Thus, Alternatives 6 and 8 would be potentially inconsistent with these policies. It appears that Alternative 12 would come closest to meeting this test. There would be substantial replacement of lost habitat and, in fact, restoration of habitat that once existed along Mission Creek, but has not been present for some time. There are additional improvements that could be made to the design to further reduce impacts, including wall designs that are more natural appearing and creating a pedestrian walk along the easterly bank of the creek between State and Yanonali Streets to connect the shoreline to the railroad depot area. With the inclusion of these measures, Alternative 12 would be potentially consistent with these policies.

4.3.2 **Visual Quality:**

The following policy in the Visual Quality Section of the LCP applies to the proposed project:

> *9.1 The existing views to, from, and along the ocean and scenic coastal areas shall be protected, preserved, and enhanced.*

The loss of skyline trees that would result from construction of any of the alternatives is potentially inconsistent with this Visual Quality Policy until such time as the replacement trees have grown enough to create a new skyline.

Alternative 12, which includes the greatest opportunity for habitat restoration incorporates establishment of native vegetation on the creek banks as well as on the slopes of

those banks. Most of the vertical walls included in the design are short, would be colored and textured and would be hidden most of the time by overhanging vegetation planted on the slopes above. Full height vertical walls have been minimized. In addition, Alternative 12 would include habitat expansion zones which would serve the multiple purpose of providing additional habitat, improving visual quality and providing for open space for use by area residents. With the exception of concerns related to all project alternatives addressed below, Alternative 12 would be potentially consistent with this Visual Quality policy.

Alternative 6 would be potentially inconsistent with this Visual Quality policy because it would not maximize the potential to enhance the scenic character of the project area. The stepped walls would still appear, in many cases, to be a single vertical wall. Plant growth would be limited by the narrow planting areas between the upper and lower portions of the stepped walls. Lower Mission Creek is the only open space of any magnitude in the West Downtown area; its loss without creation of pocket parks or other passive recreation would be potentially inconsistent with this Visual Quality policy.

Alternative 8, which would be designed entirely with vertical walls, would be potentially inconsistent with this Visual Quality policy because such channelization would not look natural. In addition, it would not meet City goals to protect and enhance the natural environment. Santa Barbara's primary economic base is built on its visual appearance and beauty. A significant contribution to this appearance is the City's Waterfront. Mission Creek flows through this important area as well as along the edge of the Downtown area. If its appearance is not designed to be aesthetically pleasing, it would not enhance the scenic character of the City. Lower Mission Creek is the only open space of any magnitude in the West Downtown area; its loss without creation of pocket parks or other passive recreation would be potentially inconsistent with this Visual Quality policy.

A significant concern for all three project alternatives would be the type of fencing proposed along the creek banks. Chainlink fencing, which is typically used to keep people out of the creek, would be potentially inconsistent with this Visual Quality policy. Where feasible, fencing should be eliminated and replaced with native plantings that would keep people out, such as wild rose and/or blackberries. In other locations, the use of decorative fencing or fencing that fades from view would be appropriate. If these mitigation measures are included in the project design, Alternative 12 would be potentially consistent with this Visual Quality policy.

4.3.3 **Land Use:**

The following policy in the Land Use Section of the LCP applies to the proposed project:

*12.2 New developments within the City's Waterfront Area shall be evaluated as to a project's impact upon the area's:*

*(1) Openness;*
*(2) Lack of Congestion;*
*(3) Naturalness; and*
*(4) Rhythm.*

The LCP defines each of the above terms and how they should be considered in reviewing projects. "Openness" refers to minimizing visual impacts in terms of building density, scale, mass and height. It also is concerned with protecting access to the Waterfront Area by balancing the distribution of coastal resources and urban facilities so that the existing degree of openness is maintained. This project's visual impacts would not relate to building density, mass, scale or height in the Waterfront Area nor would the project result in a loss of a general sense of openness (see discussion of "Naturalness").

"Lack of Congestion" refers to protecting and maintaining Cabrillo Boulevard as a scenic drive by minimizing vehicle access onto the boulevard and focusing pedestrian activities to the south of the boulevard. It also emphasizes maintenance of the uncongested quality of the Waterfront Area by requiring that parking be located north of Cabrillo Boulevard. The proposed project would not result in effects on congestion in the area. In fact, if Alternative 12 includes a creek walk between State and Yanonali Streets, it may reduce congestion on both State Street and Cabrillo Boulevard and enhance the experience for residents and visitors alike.

"Naturalness" refers to protection of views to the foothills, mountains and ocean within the existing view corridors along Cabrillo Boulevard keeping in mind motorists and other users of Cabrillo Boulevard, Palm Park users and users of adjacent beach areas and other public facilities (such as the bikeway). In addition, protection of view corridors from excessive building height or mass, intense architectural programming, facade treatment or other activities which detract from the natural dominance of these views is required. Alternative 8, which includes only vertical walls in the lower part of the creek, would have an adverse effect on the "naturalness" of the setting. The vertical walls would distract people from more distant views

because of their strong effect on near views. Rather than a somewhat natural creek appearance, tall concrete walls would be the main feature which would deflect people away from the distant views. Alternatives 6 and 12, which are all sloped or which vary in their treatment of the creek back, but include substantial establishment of native vegetation would contribute to naturalness. The type of fencing involved with any of the alternatives would also have an impact on these views.

Finally, "Rhythm" refers to "protecting, maintaining, and enhancing rhythm and patterns of the waterfront." The LCP indicates that the art show reflects the application of this principle and states that access to the beach and other activities in the area should proceed on this principle by meeting increased user demand with shuttle buses and other forms of mass transit rather than through the addition of new parking facilities in the Waterfront. The project's effect on rhythm would be similar to that of 'lack of congestion. Again, if a creek walk is included with one of the alternatives, it could enhance rhythm in this area.

Overall, Alternatives 6 and 8 would be potentially inconsistent with Policy 12.2, primarily in the areas of lack of congestion, naturalness and rhythm. Alternative 12 may be potentially consistent with this policy, especially if it is possible to create a pedestrian walk between State Street and the railroad station.

## 4.4. CALIFORNIA COASTAL ACT POLICIES:

The California Coastal Act was adopted in 1976 and is based on the California Coastal Initiative of 1972, overwhelmingly approved by the voters in order to recognize the importance of and to protect the California coastline. As noted above, its primary purposes are to protect coastal resources, assure that coastal-dependent uses have a high priority in the coastal area and protect access to the California Coast by residents of and visitors to California. The Coastal Act is part of the State Public Resources Code (PRC). The policies that apply to this project are discussed below.

4.4.1 **Public Access:**

The following Coastal Act policy on public access applies to this project:

***PRC Section 30211 - Public Access***

*Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.*

Because the proposed project area would end at the upstream end of the Cabrillo Boulevard Bridge and would, therefore, result in no changes to the beach area, it would be potentially consistent with this policy.

4.4.2 **Recreation:**

The following Coastal Act policy on recreation applies to this project:

***PRC Section 30221 - Recreation***

*Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.*

This project would not affect oceanfront land used for recreation because it would end above Cabrillo Boulevard; therefore, the project would be potentially consistent with this policy.

4.4.3 **Marine Environment:**

The following Coastal Act policies on marine environment apply to this project:

***PRC Section 30230 - Marine Environment***

*Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Two of the three project construction alternatives would result in some net improvement to biological resources. All project construction alternatives would include removal of existing concrete bottom in the project reach. These Alternatives would either be neutral or improve habitat for threatened and endangered species that occur within the project area. Alternative 8 would result in a net loss of habitat value.

Alternative 12 would include the greatest habitat improvements, resulting in a 3:1 replacement of habitat units. The reason for Alternative 12's greater habitat value is because there would be more complete stream bank habitat that could be established on the sloped rip-rap and also because of the creation of new habitat in five locations along the project reach. Even with Alternative 12, however, there is some concern that there may be an inadequate buffer for habitat purposes at the top of the bank. Alternative 12 has been further refined to include additional habitat enhancements that would protect or improve habitat for the Tidewater goby and the Steelhead trout, in consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

All of the project construction alternatives would end at the upstream side of Cabrillo Boulevard bridge. The amount of silt, sand and other materials carried by Mission Creek would not decrease. The project would not result in adverse impacts on the sand supply. Therefore, the project would be potentially consistent with this policy.

***PRC Section 30231 - Marine Environment***

*The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

The proposed project would be potentially consistent with this policy in that it would be required to meet all water quality standards required by local, State and Federal regulations, especially those of the Regional Water Quality Control Board.

***PRC Section 30232 - Marine Environment***

*Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.*

The proposed project construction alternatives would be potentially consistent with this policy due to the existing regulations, requirements and procedures on reporting, containment and cleanup of accidental spills.

***PRC Section 30233 - Marine Environment***

*(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*

*(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*

*(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*

*(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support services, shall not exceed 25 percent of the degraded wetland.*

*(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.*

*(5) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.*

*(6) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.*

*(7) Restoration purposes.*

*(8) Nature study, aquaculture, or similar resource dependent activities.*

*(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation.*

*Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.*

*(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing activities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division . . .*

*(d) Erosion control and flood control facilities constructed on water courses can impede the movement of sediment and nutrients which would otherwise be carried by storm runoff into coastal waters. To facilitate the continued delivery of these sediments to the littoral zone, whenever feasible, the material removed from these facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of this division, where feasible mitigation measures have been provided to minimize adverse environmental effects. Aspects that shall be considered before issuing a coastal development permit for such purposes are the method of placement, time of year of placement, and sensitivity of the placement area.*

This policy prohibits the diking, filling or dredging of open estuaries and wetlands except under certain conditions and for certain types of projects. There is an existing estuary at the mouth of Mission Creek which runs upstream to a point just above the Mason Street bridge. The estuary would be neither diked or filled as part of this project. Therefore, the project would be potentially consistent with this policy.

***PRC Section 30236 - Marine Environment***

*Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.*

See discussion of Water and Marine Environment Policy 6.11 under the city's Local Coastal Plan.

4.4.4 **Land Resources:**

The following Coastal Act policy on land resources applies to this project:

***PRC Section 30240 - Land Resources***

*(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only such uses dependent on such resources shall be allowed within such areas.*

*(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas.*

See discussion of Biological Resources impacts above.

***PRC Section 30244 Land Resources***

*Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.*

See discussion under the City Conservation Element Cultural Resources policies.

4.4.5 **Development:**

The following Coastal Act policies on development apply to this project:

***PRC Section 30251 - Development***

*The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character [of] surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.*

There is some disagreement on the visual quality of lower Mission Creek as it exists, especially near the creek mouth. The area from just upstream of Mason Street to the ocean is a typical estuary area. Most of the year the creek mouth is plugged with sand, creating a back water area where fish grow, shorebirds loaf or feed and vegetation develops along the edges. By late summer, the estuary is often covered with algae and the oxygen level in the water is low. This can lead to a smell that is offensive to many people. In addition, the creek is often littered with paper and plastic wrappers and other debris, leading to a distasteful appearance in addition to its smell. When streamflow is adequate during the rainy season, the flow of water unplugs the mouth and cleans the estuary area. Many years, streamflow is inadequate to blow out the sand plug so the smell and appearance problems can carry over from year to year. However, this phenomenon is a natural one.

Overall, the alternatives 6 and 8 would be potentially inconsistent with this policy because of its impact on a scenic area. However, Alternative 12 would be potentially consistent with this policy, for the most part. See the Visual Quality policy discussion of the City's Local Coastal Plan discussed in Subsection 4.3.2 of this Section and the Conservation element policy discussion in Subsection 4.2.3.2.

***PRC Section 30253 - Development***

*New development shall:*

*(1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.*

*(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.*

*(3) Be consistent with requirements imposed by an air pollution control district or the State Air Resource Control Board as to each particular development.*

*(4) Minimize energy consumption and vehicle miles travelled.*

*(5) Where appropriate, protect special communities and neighborhoods which, because of their unique characteristics, are popular visitor destination points for recreational uses.*

The proposed project construction alternatives would be potentially consistent with subsections (1), (2), (3) and (4) of this policy because they would minimize flood risks to life and property in this area, would not affect bluffs and cliffs and would not affect air quality or energy use in the long term. However, the Waterfront Area of the City is considered to be a special neighborhood that should be protected in terms of its ambience (See Section 4.3.3.3 of this Chapter for discussion of this area). The visual effects of Alternatives 6 and 8 would make it potentially inconsistent with part (5) of this policy. Alternative 12 would be consistent with this part of the policy, for the most part.

***PRC Section 30254 - Development***

*New or expanded public works facilities shall be designed and limited to accommodate needs generated by development or uses permitted consistent with the provisions of this division; provided, however, that it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road. Special districts shall not be formed or expanded except where assessment for, and provision of, the service would not induce new development inconsistent with this division. Where existing or planned public works facilities can accommodate only a limited amount of new development, services to coastal dependent land use, essential public services and basic industries vital to the economic health of the region, state, or nation, public recreation, commercial recreation, and visitor-serving land uses shall not be precluded by other development.*

The proposed project would not have a direct impact on development in the affected area in terms of the amount of development allowed by the City's General and Local Coastal Plans. However, because of the avoided costs of flood insurance and special project design, more development may occur than would be the case without the project. Because such additional development would be required to be consistent with the LCP and, therefore, the Coastal Act, the proposed project would be potentially consistent with this policy.

# SECTION- 5 - AFFECTED ENVIRONMENT AND IMPACT ANALYSIS

## 5.1 INTRODUCTION:

R The environmental effects of the proposed array of alternatives presented in the Main Feasibility Report and outlined in the EIS/EIR, the affected environment, and impact analysis by each resource are discussed in detail in chapters 6 through 19. Alternative 12 is the National Economic Development (NED) and tentatively recommended plan. Alternative 1, the No Action/No Project Alternative, represents the future without project condition. During plan formulation study, twelve alternatives were formulated to provide flood protection to the city of Santa Barbara. This Chapter summarizes the significant resources identified within the project area and which would be impacted by implementation of the recommended Alternative 12. Alternative 12 provides maximum opportunity for providing incidental environmental benefit by planting vegetation native to a riparian habitat, compared to all other viable alternatives. The EIS/EIR also includes impacts and mitigation measures related to activities.

Twelve structural Alternatives were evaluated during the Feasibility Study. After the Alternatives Formulation Briefing, based on the cost benefit ratio and incidental environmental benefits, a decision was made that Alternative 12 meets the required cost benefit ratio and provides the most incidental environmental benefits. The twelve alternatives were developed during the feasibility study. However, these alternatives were similar in nature; therefore, based on criteria, similarities and differences in the basic design features, the decision was made to evaluate four Alternatives for detailed environmental analysis in the EIS/EIR. They are Alternatives 1, 6, 8, and 12. Alternative 1 continues to be the No Action plan against which the consequences of structural solutions are evaluated. Details of these Alternatives are described in Section 3.5 of this document.

## 5.2 GENERAL EXISTING ENVIRONMENTAL CONDITIONS:

Field studies were accomplished in conjunction with this EIS/EIR within a study area (Figure 1.1.2) that extends from Carrillo Street downstream to the Pacific Ocean. (The study area encompasses all of the area potentially impacted by the Authorized Project, a more extensive area than that covered by the currently proposed alternatives.) A cultural resources survey was conducted and an Archaeological Survey Report for the Proposed Flood Control Channel Improvements Along Lower Mission Creek was prepared by a staff archaeologist, Mr. Richard Perry. This report is on file at the Corps Los Angeles District office. A Historic survey was prepared by Post/Hazeltine Associates. The Survey is summarized in the Cultural Resources Section. The survey is on file at the Corps Office and at the City of Santa Barbara

Planning Division. The report of surveys for biological resources within the project area was conducted by a staff biologist, Dr. John Moeur. The EIS/EIR summarizes the results of field studies conducted by the U. S. Army Corps of Engineers (USACOE). The loss of habitat due to project construction and the value of mitigation options were quantified by a modified Habitat Evaluation Procedures analysis. A study and survey of other resources/factors within the study area, including a preliminary assessment screening for the potential presence of hazardous and toxic waste materials, water quality, and chemical analysis of sediment within the study area, were conducted by KEA Environmental, Inc. Information on the City of Santa Barbara General Plan and Policies for all resources including land use data and analysis, and growth inducement was provided by the City of Santa Barbara. Details of the City of Santa Barbara's General Plan and Policies on Environmental Resources are included in Section 4. In addition, an evaluation of each resource in relation to the criteria set by the City of Santa Barbara is taken into consideration. The Corps of Engineers technical staff conducted and participated in field surveys, analysis, coordination, and mitigation planning. The Notice of Intent was prepared by the USACOE technical staff working together with technical staff of the City of Santa Barbara, who reviewed the reports and mitigation planning. The City of Santa Barbara prepared the requisite Notice of Preparation, and Initial Study (Appendix I). The City of Santa Barbara's technical staff, Ms. Janice M. Hubbell, AICP, Project Planner, provided evaluation of applicable regulations of the City of Santa Barbara General Plan and Local Coastal Plan for each resource. The technical staff ensured that the document is written in compliance with CEQA and applicable General Plan and Local Coastal Plan goals and policies are incorporated in the evaluation of each resource.

The EIS/EIR includes, as appropriate, consideration of impacts of both initial construction and future periodic debris removal; cumulative impacts of the proposed action on the environment when added to reasonably foreseeable future actions/projects in the area; a summary of mitigation measures and environmental commitments; the relationship between short-term uses of man's environment and maintenance and enhancement of long-term productivity; and any irreversible or irretrievable commitment of resources which would be involved in the proposal should it be implemented. Alternative 1, the No Action/No Project (future without project conditions) alternative, is discussed in Chapter 3 of the EIS/EIR. Impact analysis of Alternatives 12, 6, and 8 is discussed by factor or resource topic (see Chapters 6 to 19). Because none of the alternatives would have a detectable impact on local or regional climatic conditions, climate is discussed in this analysis only in the context of air quality impacts.

## 5.3 EXISTING SIGNIFICANT RESOURCES LOCATED WITHIN THE PROJECT AREA.

Evaluation of each environmental resource has been performed in this EIS/EIR. A survey of each resource was performed. After identification of each resource located within the project area, it was determined that the project area does contain two significant resources, biological and cultural. Therefore, only these two resources have been discussed briefly in the following paragraphs.

R **Biological Resources:**

Two species of fish, both listed for Federal protection as endangered under the Endangered Species Act, make use of Mission Creek. The tidewater goby (*Eucyclogobius newberryi*) enters the creek from the coastal lagoon and forages as far upstream as the Chapala Street Bridge. At that point, a man-made sill about 1½ feet high and spanning the entire channel probably blocks gobies from swimming into the lower end of the sandstone-walled channel in all but the high water events of the winter rainy season, a time of year when gobies would congregate much closer to salt water anyway. Tidewater gobies would be present in the area to be affected from late spring through the fall months. The second species, steelhead (*Oncorhynchus mykiss*), use the lower end of Mission Creek as a migratory channel when flow conditions permit. Adults could swim upstream after steady winter rains have raised runoff rates. The species evidently spawns successfully in some years in the upper reaches of the watershed. Juvenile steelhead would use Mission Creek through the project area only as a migratory corridor to the ocean. Lower Mission Creek, the area within the project area, does not afford rearing conditions or suitable spawning conditions for steelhead.

Isolated native trees of notable age still occur at various locations along the creek. Of these, six are western sycamores (*Platanus racemosa*) and one is a coast live oak (*Quercus agrifolia*). Elsewhere along the creek, a young cottonwood (*Populus fremontii*) struggles to survive against the effects of periodic channel maintenance, and a few mature willows (*Salix lasiolepis*) and fewer still white alders (*Alnus rhombifolia*) have become established on the overbank.

The large Moreton Bay Fig Tree (*Ficus macrophylla*), for which Santa Barbara is renowned, grows east of Mission Creek and at an elevation about 7 feet higher than the channel.

**Cultural Resources:**

As planned, the preferred alternative is unlikely to adversely affect any prehistoric cultural resources. However, due to the close proximity to the ethnohistoric Chumash village of syxutun, the potential exists for discovering unknown archeological deposits as a result of channel widening activities. The proposed alternative will impact 10 historic resources, none of which are eligible for inclusion in the National Register of Historic Places (NRHP). Some of the structures will need to be removed or partially removed to accommodate the widening of the channel. With the exception of the NRHP eligible Chapala Street Bridge, the other bridges in the APE are not eligible for NRHP listing.

In addition to the houses along the creek channel, five other historical entities are evaluated. The Potter Hotel footbridge, the Chapala Street Bridge, the Sandstone Diversion on the reach of Mission Creek between Montecito and Chapala Streets, the Hotel Californian Garage (15 West Mason Street), and the Moreton Bay Fig Tree. The Potter Hotel footbridge, and the Hotel Californian Garage may be removed to accommodate the proposed channel widening. All historic buildings and structures in the area of potential effects that will be affected by the proposed channel widening project are enumerated in Section 18.

## 5.4 SUMMARY OF ENVIRONMENTAL CONSEQUENCES OF THE PREFERRED ALTERNATIVE:

### 5.5.1 Biological Resources:

R The preferred plan for bank stabilization, a riprap slope extending to the bank top from low channel walls, would allow planting of a narrow but viable corridor of native riparian vegetation. A canopy consisting of several species of native trees, and an understory layer consisting of willows and other native perennial species would be planted. Overall, habitat restoration of Lower Mission Creek would restore a significant wildlife corridor to this coastal stream.

R Removal of concrete surfaces from many places along the creek and restoration of a natural bottom would enhance aquatic habitats along the creek. Placement of large boulders for the purpose of dissipating stream flow energy would also promote stream conditions favorable to all fish and benthic organisms. Expansion of the creek channel below Yanonali Street would increase the habitat available to tidewater gobies. Various structural adaptations of the walls would mitigate for unavoidable, but not significant effects on gobies and steelhead. These features, and the maintenance techniques which have been developed, would yield an important measure of incidental ecological benefit.

Construction of flood control structures along Mission Creek would cause significant, temporary impacts to the stream's bottom, and thereby to the low-quality aquatic habitat which exists along the channel. Similarly, significant and temporary impacts would occur to coarse, weedy vegetation along the banks. Solitary, stately native trees would be removed in two locations to accomplish construction.

Direct impacts to gobies would be minimized by slowly de-watering half the channel at a time to allow construction in dry conditions. This plan would entail enclosing half of channel at its lower end with sheet piling, then trapping as many fish as possible and removing them to the other side of the piling. The process would be repeated for the other half of the channel. Impacts to steelhead would be avoided, or minimized, by scheduling construction in the channel and along the banks during the summer and fall months, when steelhead would not normally be present.

Direct mechanical injury of fish or indirect but adverse effects such as impaired respiration caused by greatly increased turbidity could have impacts to steelhead while construction is underway in these upper waters of the project area. Measures to avoid or minimize unavoidable impacts include scheduling construction work outside the migration period, on-site monitoring for and supervised relocation of young salmonids encountered unexpectedly, temporary barricades at the upstream end of sections under construction to exclude smolt sized fish, or temporary use of a pilot channel through the current construction area screened at its upper end to block smolt-sized fish. Any fish netted and relocated would sustain adverse and temporary effects.

Construction effects have the potential to damage small roots of the Moreton Bay Fig, but not the principal components of its root system. Construction would occur sufficiently far from it to avoid any direct impact to its buttress roots, trunk, or branches. The flood control structure should have no effect on subsurface water flow around the fig tree.

**Cultural Resources**:

Alternatives 6, 8, and 12 have the potential to require removal of a number of historic structures. The City of Santa Barbara awarded a contract to conduct an updated architectural survey of the affected environment in the area of potential effects (APE). The survey report, completed in November 1999, recommended buildings and structures which should be determined eligible for the National Register, California Register or local listing. There are potential adverse effects under the National Historic Preservation Act for Alternatives 6 and 8. There are none for Alternative 12. Mitigation of adversely affected historic properties under Alternatives 6 and 8, may consist of historic recordation of the locally significant historic

properties, and possible relocation of important houses. Archeological and Native American monitors will be on-site during all ground disturbing activities to ensure that if any Native American materials or deposits are discovered, the Corps of Engineers and the City of Santa Barbara will be notified immediately.

# SECTION - 6 - GEOLOGY

A geotechnical evaluation of the site without project conditions for the proposed flood control project on Lower Mission Creek was conducted by the Geotechnical Branch of the Corps of Engineers. The geotechnical report is enclosed in the Main Report as Appendix B. The report describes the known geological conditions, preliminary design considerations and lists the sources of materials. Prior to the construction of the project, it is essential to conduct necessary geotechnical evaluation to develop design parameters and construction conditions.

## 6.1 SITE TOPOGRAPHY:

Mission Creek is located on the southern slope of the foothills of the Santa Ynez Mountains. The stream originates in the mountains, crosses the foothills and flows through the City of Santa Barbara via a meandering course and a flat alluvial plain near the Pacific Ocean. The Santa Ynez Mountains are part of the east-west trending Transverse Range geologic province, and they are complexly folded and faulted within the project area. These mountains are composed of mainly igneous and sedimentary rock. The maximum elevation of these mountains behind Santa Barbara is about 4,000 feet.

The existing topographical environment adjacent to the lower reaches of Mission Creek is relatively flat, ranging from a 50-foot elevation at Carrillo Street to sea level at the outlet. Mission Creek bisects the City of Santa Barbara. The creek is narrow, usually between 40 and 50-feet wide, with dense urban land uses occupying most of the floodplain right up to the creek bank. The natural creek bank is fragmented by flood control features, including gabions, sacked concrete, piled stone, pipe and wire revetment and bulkhead structures. The creek bottom is made up of large cobbles, sand and some overflow of concrete from flood control structures. There are no unique or unusual geological features related to Mission Creek.

## 6.2 EXISTING GEOLOGICAL CONDITIONS:

### 6.2.1 Regional Geology:

Near the city of Santa Barbara, the Santa Ynez Mountains are composed of Quaternary and Tertiary age sediments. The Tertiary sediments are marine and non-marine sandstone, shale and conglomerate. The beds generally dip southward toward the ocean, and range from well-cemented to poorly-cemented. The Quaternary sediments are non-marine and marine. The non-marine sediments are poorly cemented conglomerates, including boulders and gravels, and are prominent in portions of the foothills and form most of Mission Ridge. Stream bed and alluvial fans of Lower Mission Creek are of Quaternary age and mainly consist of alluvial materials ranging from coarse gravel to boulders. Near the Pacific Ocean shore, mainly silt and clay soils are found. Intermediate materials such as silt, sand and gravel are also present throughout the alluvial plain. The marine sediments are beach, estuary and lagoon deposits found close to the ocean. The alluvial materials vary in thickness from 200 feet just south of the Mission Ridge - Arroyo Parida Fault to more than 1,000 feet at the Pacific Ocean. The Tertiary bedrock is approximately 40,000 feet thick in the Santa Barbara area, and is underlain by an older basement

complex. See Plate 1 for the Regional Geologic Map in the Geotechnical Report, Appendix B of the Main Report.

6.2.2 **Existing Seismicity and Earthquakes**:

The geological structure of the project area consists of mountain ranges, valleys, faults and folds. The project area is located near two major parallel faults, the Santa Ynez to the north, and the Mission Ridge-Arroyo Parida to the south. These east-west trending structures are the result of regional, tectonic compressional stress associated with the San Andreas Fault Zone.

Numerous historically active and potentially active faults occur between the San Andreas Fault Zone and the Channel Islands. Faults in the immediate area of the city of Santa Barbara include the Mesa Fault, Montecito Fault, Sycamore Fault, Lavigia Fault, and Lagoon Fault. See details on fault location in the geotechnical report.

**Historic Earthquakes**. Nineteen earthquakes with Magnitudes of 6.0 or greater have occurred within a 100-mile radius of the project area in the last 96 years. However, prior to 1932, only six earthquakes having a magnitude of 6.0 or greater occurred within a fifty-mile radius of the project area. In 1812, the largest earthquake known to have occurred in the Channel was an estimated Magnitude 7.0+ event which occurred between Santa Rosa Island and San Miguel Island, about 16 miles south and west of the project area. This event caused a great deal of damage to Santa Barbara (U.S.G.S, 1975). The event which caused the most damage to the Santa Barbara area in recent years was an estimated magnitude 6.8 event in 1925, located about 12 miles south of the project area in the Santa Barbara channel. In August 1978, a Magnitude 5.1 event occurred about 3-1/4 miles southwest of the project area in the Santa Barbara Channel. This was the closest magnitude 5+ event to the project area (see details in Geotechnical Appendix).

6.2.3 **Potential Seismicity.**

The various active faults for future earthquakes are the San Andreas, 39 miles northeast of the project, and the various east-west trending faults which lie in the Santa Barbara Channel up to 25 miles south of the project area. A Magnitude 8.0 event on the San Andreas Fault would cause an estimated bedrock acceleration of 0.11g at the site. A Magnitude 7.1 event on the nearby Red Mountain fault, located about 10 miles from the site, would cause an acceleration of 0.34g at the site. An event of 6.0 on the potentially active Mesa-Rincon Creek fault, about 3/4 to 1 mile from the site would cause a bedrock acceleration in excess of 0.5g at the site. An event of similar magnitude on any of the other nearby active Santa Barbara Channel faults would cause an acceleration of at least 0.28 to 0.35g at the site (Geotechnical Appendix).

6.2.4 **Tsunamis**.

Tsunamis are sea waves believed to be generated by large offshore earthquakes, volcanic eruptions and/or large submarine landslides. All low lying coastal areas of California are subject to the threat of tsunamis, but the hazard for Santa Barbara is moderate, depending upon tidal conditions. This is based upon previous history, distant great earthquakes and local offshore events. The hazard from tsunamis is greatest if the highest high tide of the month and the tsunami are coincident. See the Geotechnical Appendix for details on occurrence of tsunamis

within the project area.

### 6.2.5 Geotechnical Conditions of Lower Mission Creek Channel:

The area surrounding the existing channel is composed of Quaternary non-marine and marine sediments varying in thickness from 600 to 800 feet, overlying Tertiary non-marine and marine bedrock. The non-marine sediments are alluvium, derived from the nearby Santa Ynez Mountains. These sediments are Holocene deposits overlying Pleistocene older alluvium. The most recent alluvial deposits are the streambed deposits that are typically poorly graded sands and gravels, with cobbles to 9 inches in diameter. The older alluvial deposits are composed of sands and gravels and are encountered only at depths approaching 30 feet.

The marine sediments are lagoon, estuary and beach deposits. The lagoon and estuary sediments are composed of gray, blue-gray and black silty sands, clayey sands, sands, sandy clays, and lean clays, with organic odors. Overlying the marine deposits are approximately 1 foot of poorly graded sands and gravels to 3 inches. The beach materials beyond the mouth of the proposed channel improvement are visually described as fine to medium grained sand-silty sand.

## 6.3 CITY OF SANTA BARBARA GENERAL PLAN AND LOCAL COASTAL PLAN GOALS AND POLICIES FOR SEISMIC SAFETY AND GEOLOGIC HAZARDS:

Applicable goals and policies for geologic hazards and seismic safety are provided in the following paragraphs.

***Goals:***

*The Seismic Safety/Safety Element is focused on analyzing existing geologic, flood, earthquake related, fire and other life-threatening considerations and developing means of avoiding or preparing for disasters related to these concerns. The following are recommended major goals for adoption:*

*To protect life, property and public well being from seismic and other geologic hazards.*

*To reduce or avoid adverse economic, social, and environmental impacts caused by geologic conditions.*

## 6.4 IMPACTS ON GEOLOGICAL RESOURCES:

Impacts would be considered significant if the project is located within a fault hazard area without performing appropriate seismic-geologic investigations, if construction methods failed to meet seismic standards, or if the project will result in loss of life, property and public well being from seismic and other geologic hazards.

6.4.1 **Alternative 1 (No Action):**

The No Action Alternative would not have any impact on geological resources and seismic factors.

6.4.2 **Alternatives 12, 6 and 8**:

Prior to project construction, geotechnical studies will be conducted and seismic factors and construction methods would be considered in reconfiguration of the channel, its earth-bottom, and side-slope stabilization. The project would not result in loss of life and property from seismic and other geologic hazards. For all alternatives, seismic factors and construction methods will be examined and implemented to conform to seismic standards and would be incorporated into the project design (see details in Geotechnical Appendix, Section 8).

R The analysis in this section considered that the design of each alternative would incorporate a number of measures to reduce potential effects from groundshaking, including adherence to guidelines from the Uniform Building Code (UBC), the Division of Safety of Dams (DSOD), local grading ordinances, current seismic design specifications of the Structural Engineering Association of California (SEAOC), various others regulatory requirements, and the recommendations of additional site-specific geotechnical investigations.

**Topography**

Construction of the flood control improvements would alter the existing creek and its topographical gradient by excavating areas to increase the channel capacity. These activities would not substantially alter the regional topography. Therefore, changes to the creek would result not result in adverse impacts to local topographical characteristics.

Proposed operations and maintenance activities would result in clearing sediment out of the project reach about once every there years. These activities would not change the depth of the created invert or alter the surrounding topographical features. Adverse effects to regional or local topography would not occur during operation and maintenance activities.

The project would incorporate standard Best Management Practices (BMPs) and other erosion-prevention measures during construction activities (refer also environmental commitments identified in Section 7, Water Resources). The project would incorporate landscaping compatible with the immediate surroundings, such as indigenous native plant material. No significant soil-related impacts would occur during construction or maintenance activities.

**Ground Acceleration and Ground Shaking**

The various active faults for future earthquakes are the San Andreas, 39 miles northeast of the project, and the various east-west trending faults which lie in the Santa Barbara Channel up to 25 miles south of the project area. Although the study area is subject to high seismic forces, the channel alignment is parallel to, not crossed by, the major faults in the area. While the channel could be damaged (by cracking and/or some vertical displacement) during a seismic event, it is unlikely to be rendered ineffective during such an event.

In order to minimize the risk of potential damage from ground acceleration and ground shaking associated with a major earthquake, the project design and specifications would incorporate measures from current seismic design codes. Operations and maintenance activities are not expected to result in any seismic-induced hazard. Therefore, the potential impact would be less than significant.

### 6.4.3 Future Sediment Removal:

Details about the anticipated pattern of sediment deposition or erosion in various project reaches has been identified (Section 3.5, EIS/EIR). Sediment deposition or erosion is dependent upon the intensity of the storm event. Eroded creekbed would be maintained during future maintenance. Prior to filling the scoured creekbed, a qualified biologist would evaluate the site and ensure that there would not be any adverse impacts to biological resources. Future sediment removal would not have any impact on geological resources.

## 6.5 Mitigation Measures

Erosion and sediment control measures will be implemented by the construction contractor in the project area and upstream of the project limits to prevent sloughing of materials into the flood control channel during construction. The contractor will also implement BMPs to reduce the potential for erosion and increase slope stabilization. The following specific mitigation measures will be implemented by the construction contractor and will further reduce adverse but not significant impacts.

- Surface roughening and terracing of the steep slopes along both sides of the channel will reduce erosion potential by decreasing runoff velocities, trapping sediment, increasing infiltration of water into the soil, and providing a more stable slope for revegetation.

- Altered slopes will be stabilized by construction of a short wall and riprap, planted vegetation would be irrigated to ensure growth success.

- Grading plans will incorporate the following short-term erosion control measures to control sloughing of materials into the channel during construction activities and establishment of a permanent vegetation cover.

    - silt fences, gravel bags, or rock filter berms will be placed below the toe of slopes to prevent sloughing of materials into the channel.

    - fiber rolls or sediment logs will be placed along the face of exposed and erodible slopes to shorten slope length or at grade breaks where slopes transition to steeper slopes.

The project would incorporate standard Best Management Practices (BMPs) and other erosion-prevention measures during construction activities (refer also environmental commitments identified in Section 7, Water Resources). The construction contractor would prepare a Storm Water Prevention Plan to prevent project related erosion. The project description already includes a requirement for complete geotechnical, seismic and soils analysis and inclusion of the recommendations in the final project design.

## 6.6 RESIDUAL IMPACTS:

There will be no residual impacts.

# SECTION - 7 - WATER RESOURCES

## 7.1 EXISTING WATER RESOURCES:

Surface water quality in the upper canyon areas, above urban development, is generally considered very good. Water quality deteriorates, however, as Mission Creek flows through the city of Santa Barbara to the ocean. A shallow groundwater aquifer and a deep groundwater aquifer underlay the area. The shallow aquifer is subject to surface pollution and is, therefore, not considered suitable for domestic drinking water. Most of the wells in the Santa Barbara area are drilled within the deep aquifer and yield water suitable for domestic use. According to a U.S.G.S. study (Water Supply Paper 2197, 1984), 9 of 30 wells sampled yielded total dissolved solids (TDS) concentrations near or at the inferior quality level (1000 mg/l). These wells were usually high in chloride concentrations in excess of the U.S. Environmental Protection Agency (EPA) recommended limit. Ocean water was determined to be the source of the degraded water yielded by 6 of the 9 wells, due to sea water intrusion.

The Mission Creek drainage area is the largest of several coastal stream systems in the Santa Barbara area (Kaufman, Bontrager, and Pierce 1986). Mission Creek and its major tributary Rattlesnake Creek originate north of the city of Santa Barbara in the Los Padres National Forest in the Santa Ynez Mountains. Mission Creek and its tributaries drain a watershed of approximately 12.2 square miles.

The headwaters of Mission and Rattlesnake Creeks are at an elevation of 3,985 feet. The upper reaches of these creeks, which are largely natural, flow through steeply sloped canyons with lush riparian habitat. Debris basins have been constructed on Upper Mission Creek and on Rattlesnake Creek. These debris basins are cleaned out approximately every 6 years by the Santa Barbara County Flood Control District (SBCFCD) (U.S. Army Corps of Engineers, 1986). The channel in the lower reaches of the creek is cleared of vegetation every few years by the SBCFCD (Pers comm., Karl Treiberg, SBCFCD). The upper portions of Mission Creek and Rattlesnake Creek either are perennial or consist of isolated pools which receive water from subsurface flows. The lower reaches of the creek are typically dry from early summer to the beginning of the following wet season (Cooper and Hemphill, 1984). Natural flow patterns are sometimes altered by releases from Gibraltar Reservoir.

### 7.1.1 Surface Water Quality

Surface water quality in the upper portion of Mission Creek is reported to be good (URS Greiner Woodward-Clyde, 1999). Water quality degrades along the mid and lower reaches of Mission Creek as the gradient becomes less steep and the environment becomes increasingly urbanized. The lower portions of Mission Creek pass through the urban area of the City of Santa Barbara. From State Street downstream to the Pacific Ocean, most of Mission Creek has been modified (Kaufman, Bontrager, and Pierce, 1986). The natural flow patterns of Mission Creek

have been changed to accommodate urban development (City of Santa Barbara, 1985). Although vegetated habitat still exists within the project reach, it consists mostly of non-native species including arundo (a noxious invasive species of giant reed). The creek bed and slopes have been altered by a variety of flood control structures, including gabions, sacked concrete, piled stone, pipe and water revetment, and, near the ocean, bulkhead structures. Residential and commercial developments abut the creek. Surface water, which is typically present during the winter to spring wet season, consists of flows from the upper reaches of Mission Creek and Rattlesnake Creek, as well as stormwater runoff from the surrounding urban areas. The runoff from urban areas would be expected to be of poor water quality. Stormwater pollutant loading (i.e., the amount of pollutants washed off by stormwater runoff) are influenced by the area rainfall pattern, the total area of the drainage basin, and the distribution of different land-use types in the drainage basin (Woodward-Clyde Consultants, 1990). Contaminants which are likely to be of particular concern in urban runoff include oil, grease and inorganic pollutants, especially lead, zinc, and copper. Pathogens, total suspended solids and nutrients can also be a problem in urban runoff. Table 7.1-1 contains estimates of typical pollutant concentrations in stormwater runoff from different types of land use areas. Typical in southern California urban areas, the highest pollutant loads in storm runoff occur during the first major storm of the year when contaminants that have accumulated during the dry season are washed into drainages (SCAG, 1988).

On October 2, 1998, a field reconnaissance of the stream was conducted by wading the subject reach from the Canon Perdido Street Bridge to the Highway 101 Bridge. At this point, the water was too deep to continue wading and the rest of the reach from the Highway 101 Bridge to the State Street Bridge was observed from various vantage points along the stream banks. Observations and field notes were made, and photographs were taken to record conditions along the stream.

The most obvious vector for transporting contaminants to the creek within the subject reach is stormwater runoff. Visual inspection of the subject reach revealed large stormwater discharge pipes beneath every bridge. Very little potential exists for overland surface runoff to enter the creek in this area. The majority of the creek banks are armored either with poured concrete, stacked cement-filled bags, or with stacked and grouted rock (floodwalls). Drainpipes have been incorporated as an integral part of the design of these floodwalls. No observations were made of "illicit" discharge pipes likely to convey either hazardous liquids (e.g., solvents, fuels, or lubricants) or common household wastes to the creek. The flood wall-related drain pipes appeared to have been designed to serve the purpose of preventing groundwater destabilization of the armoring during storm events.

The stormwater discharge pipes underneath the bridges convey to the creek any contaminants entering the existing stormwater collection system from up gradient streets and impervious surfaces. The creek flood wall drain pipes appear to collect and discharge stormwater as it flows through the subsurface soils toward the creek.

**TABLE 7.1-1**
**ESTIMATES OF TYPICAL POLLUTANT CONCENTRATIONS IN STORMWATER RUNOFF FROM URBAN AREAS AND HIGHWAYS**

| Pollutant* | Residential | Commercial | Mixed | Open | Highway |
|---|---|---|---|---|---|
| TSS | 101.0 | 69.0 | 67.0 | 70.0 | 142.0 |
| BOD | 10.0 | 9.3 | 7.8 | 6.0 | 14.0 |
| COD | 73.0 | 57.0 | 65.0 | 40.0 | 114.0 |
| Total P | 0.383 | 0.201 | 0.263 | 0.121 | 0.400 |
| Soluble P | 0.143 | 0.080 | 0.056 | 0.026 | 0.200 |
| TKN | 1.900 | 1.179 | 1.288 | 0.965 | 1.830 |
| NO2+NO3 | 0.736 | 0.572 | 0.558 | 0.543 | 0.760 |
| Total Cu | 0.033 | 0.029 | 0.027 | 0.030 | 0.054 |
| Total Pb | 0.144 | 0.104 | 0.114 | 0.030 | 0.400 |
| Total Zn | 0.135 | 0.226 | 0.154 | 0.195 | 0.329 |

Source: Final Report of the Nationwide Urban Runoff Program, Prepared by Woodward-Clyde consultants for Water Planning Division, U.S. Environmental Protection Agency, December 30, 1983.
*TSS - Total Suspended Solids; BOD - Biological Oxygen Demand; COD - Chemical Oxygen Demand; P - Phosphorus; TKN – Total Kjeldahl Nitrogen; N02 - Nitrate; N03 - Nitrite; Cu - Copper; Pb- Lead; Zn - Zinc.
Pollutant Loading and Impacts from Highway Storm Runoff, Prepared by Woodward-Clyde consultants, for the U.S. Department of Transportation, Federal Highway Administration. Report No. FHWA/RD-88-007, April 1990.

Another obvious source of contamination is the use of the creek as a disposal site by area residents and/or others. The field reconnaissance of the creek revealed a wide variety of trash and foreign items within the creek channel. These included numerous empty motor oil and motor coolant containers, empty bottles of all types, numerous shopping carts, discarded bicycles, cartons and containers from a recently used camp site under a bridge.

The water sampling plan called for taking samples from the creek during low flow conditions during late summer or early fall and then obtaining subsequent samples during higher flow conditions following several rain events at a later date. The sediment sampling plan requires only one sediment sampling event at each sampling site.

Sampling during low flow conditions occurred during late September and early October 1998. On September 25, 1998, water samples and streambed sediment samples were taken at three locations along Lower Mission Creek (Figure 1). These locations were: Site #1 - approximately 30 yards west of the State Street bridge north of Cabrillo Boulevard; Site #2 - at West Gutierrez Street approximately 60 yards below the downstream side of the bridge; and

Site #3 - at West De la Guerra Street approximately twenty feet below the downstream side of the bridge. Global Positioning System coordinates for these locations were noted. They are: Site #1- N34$^{N}$ 24' 44.26", W119$^{N}$ 41' 26.75" ; Site #2 - N34$^{N}$ 24' 48.78", W119$^{N}$ 41' 42.99"; and Site #3 - N34$^{N}$ 24' 57.64", W119$^{N}$ 42' 11.98".

On October 2, 1998, water samples were taken from the same locations as were sampled on September 25. Water sampling under high-flow conditions occurred on February 10, 1999, following moderately heavy rainfall which occurred on February 9. Water samples were taken at the same locations as during the earlier (low-flow) effort. Possible HTRW constituents of concern (analyses) and laboratory analytical methods employed to identify them and quantify their concentrations (if present) are listed in Table 1 of Appendix F.

### 7.1.2 **Water Sample Analysis**:

Results of the laboratory analysis of the water samples taken from the three sampling locations during September and October 1998 are provided in Tables 3 - 5 in Appendix F. Almost all analyses were below the detection limits for the prescribed analytical techniques. No organochlorine pesticides, polychlorinated biphenyls, or poly nucleated aromatic hydrocarbons were detected at any of the three sampling locations. The same was true for metals and non-metals with the exception of location #1 where lead was reported at a concentration of .0090 parts per million (ppm) (detection limit is .0050). There is no recognized Maximum Contaminant Level (MCL) for lead in drinking water. EPA's current National Primary and Secondary Drinking Water Regulations do not indicate/recommend remedial action until concentrations reach .015 parts per million.

Concentrations of Tributyltin just above detection limits (2 parts per trillion[ppt]) were found at all three locations. Reported concentrations were 3.7, 4.2, and 13 ppt at locations #1, #2, and #3 respectively. Tributyltin is a biocide, antifoulant, and disinfectant used in paints, cooling towers and other applications to prevent growth of organisms such as barnacles, algaes, and other biota considered to be economic pests in certain situations (Source: Farm Chemicals Handbook, Richard T. Meister, Editor in Chief, Meister Publishing, Co. Willoughby Ohio, 1990). There is no current MCL related to the substance.

### 7.1.3 **Sediment Sample Analysis**:

Results of the laboratory analysis of the sediment samples taken from the three sampling locations during the late fall are provided in Tables 7 and 8 in Appendix F. Almost all analyses were below the detection limits for the prescribed analytical techniques. No organochlorine pesticides or polychlorinated biphenyls were found at any of the three sampling locations. No poly nucleated aromatic hydrocarbons were detected at locations # 1 or #2. At location #3, concentrations just slightly greater than detection thresholds were reported for Ben(a)anthracene (4.6 ppb), Benzo (a)pyrene (3.3 ppb), Benzo(b)fluranthene, (at detection limit of 2.0 ppb), Chrysene (7.3 ppb), Phenanthrene (6.9 ppb), and Pyrene (7.1 ppb). Although MCLs are applicable to drinking water, not sediments, they can provide a relative reference for interpreting the analytical results in the absence of other standards. However, no MCLs exist for these substances with the exception of Benzo(a)pyrene which has an MCL of zero and an action

threshold of .0002 parts per million. The analyte Fluoranthene was reported at location # 3 at a concentration of 20 ppb. No MCL exists for this substance nor does the EPA report any Preliminary Remedial Goals (PRGs) for this substance.

Total Recoverable Oil and Grease and Total Petroleum Hydrocarbons were reported in noticeably greater concentrations than the detection threshold of 5 ppb. At location #1, they were reported at 75 and 59 ppb respectively. At location # 2, they were reported at 110 and 76 ppb respectively. At location # 3, they were reported at 270 and 210 ppb respectively. No MCLs were found for oil and grease, and the CCRWCB Basin Plan does not address contaminants in sediments. No EPA PRGs were found for Oil and Grease.

Chromium, Copper, Lead, Nickel, and Zinc were all reported at concentrations noticeably above the detection thresholds with concentrations trending higher toward the downstream reaches of the creek. Drinking water MCLs for these substances are reported as follows: Chromium - .1 ppm, Copper - 1.3 ppm, Lead - zero ppm, Nickel - no MCL (the EPA's PRG is 1500 ppm ), and Zinc - no primary MCL, but a secondary standard of 5 ppm. National ranges of native soil concentrations (ppm) for these elements are reported as follows; Chromium - 5.0-3000, Copper - 2.0-100, Lead - 2.0-200, Nickel - 5.0-1000, and Zinc - 10-300.

### 7.1.4 **Discussion of Water and Sediment Sample Analyses**:

**Water**

As stated above, results of the initial water sampling event were that almost all analyses were below the detection limits for the prescribed analytical techniques. No organochlorine pesticides, polychlorinated biphenyls, or poly nucleated aromatic hydrocarbons were detected at any of the three sampling locations. Additional sampling will take place during the high stream flow period winter months. In addition, the County and City of Santa Barbara are conducting water quality tests in the same reach of the creek to provide background data for development of a joint stormwater pollution prevention plan. The results of those efforts will also be available for review, comparison, and consideration. The County was able to sample during the drier part of the year (which will be comparable with the first phase sampling analyzed above) and was able to obtain water samples immediately following the first storm of the year (first flush samples) (pers Comm Dan Reed, Supervisor, County of Santa Barbara Health Services Department). The first flush samples are generally recognized as potentially containing the highest level of contaminants of the year and should be a good indicator of the high end of contamination potential for stormwater runoff.

One analyte which was found in levels greater than detection limits, Tributyltin (TBT) has the potential to be problematic to aquatic organisms. According to EXTOXNET primary files maintained and archived at Oregon State University, TBT is highly toxic to crustaceans and molluscs. Concentrations as low as 3 ppt were found to adversely affect the mud snail and dogwhelk. Larvae are generally more sensitive to this substance than are adults. Freshwater species bioaccumulate more TBT than will marine organisms. Juvenile chinook salmon accumulate TBT immediately upon exposure (Source: http//ace.orst.edu/cgi-bin/mfs/01/pips/tributyl.htm?181#mfs). No information was found regarding TBT effects on steelhead (a Federally listed endangered species which purportedly exists in Mission Creek). As

stated above, TBT is an important ingredient in many marine paints and pesticides; however, it is unknown whether the release to Lower Mission Creek was from a point or non-point source.

**Sediment**

It is unknown whether the release of Polynuclear Aromatic Hydrocarbons (PAH's) to Lower Mission Creek was from a point or non-point source at sampling location # 3. PAH's are by-products of combustion and the low concentration levels reported in this location could have originated from a variety of sources including discharge of bar-be-que ashes or burn pile debris into the creek.

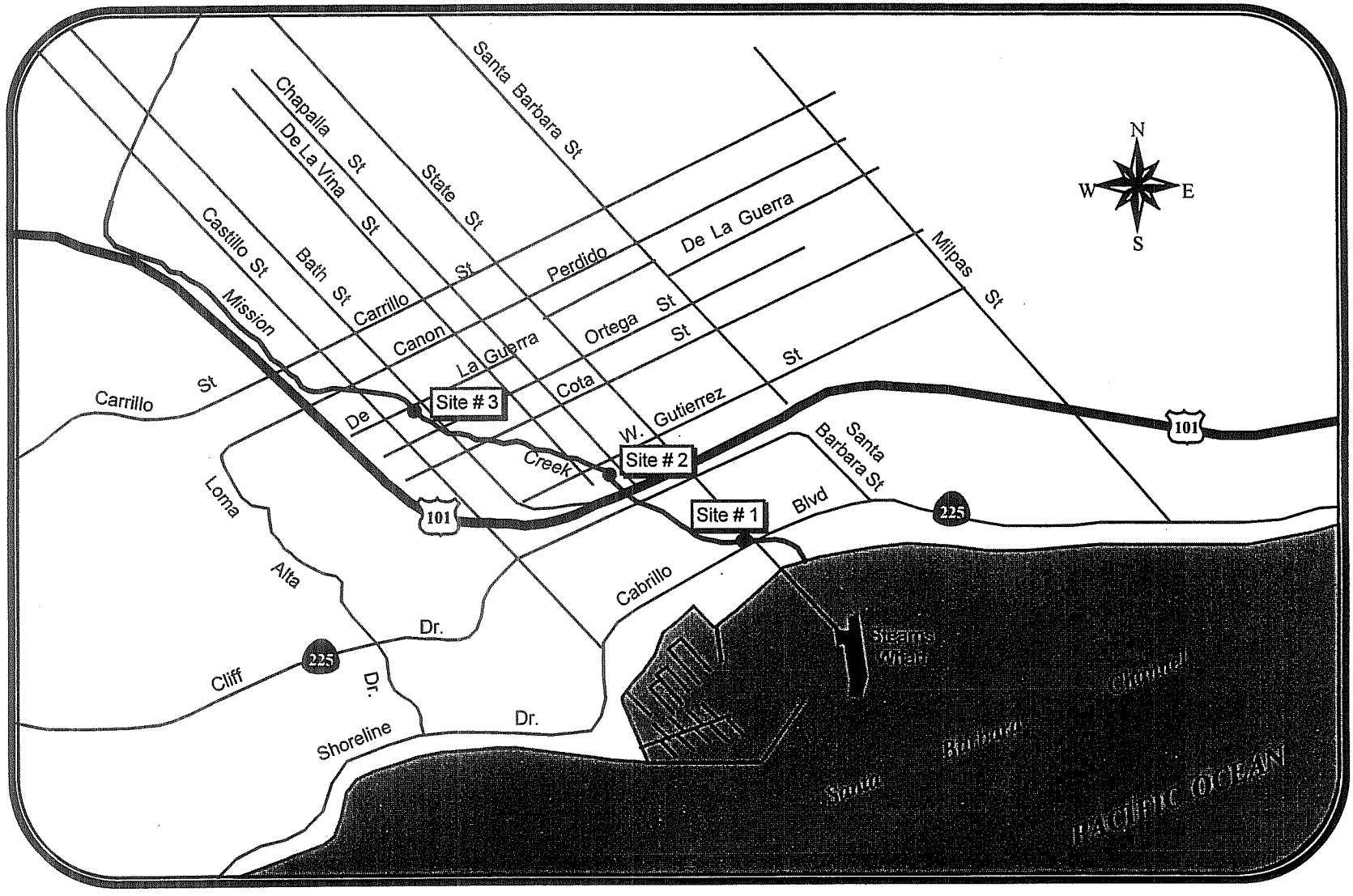
It is also unknown whether the release of oil and grease at sampling locations # 2 and # 3 was from a point or non-point source. A number of explanations of the possible sources are plausible. The reported concentrations are consistent with the discharge of used motor oils and lubricants into the creek in these areas. As discussed above, there was ample visual evidence of this practice during the field reconnaissance of the subject reach. An analysis of the first flush water samples for these contaminants could provide clues as to the possible source of discharge. No published regulatory criteria for oil and grease in sediments are known.

The levels of Chromium, Copper, Lead, Nickel and Zinc were well within the natural occurring background levels occurring in soils nationally. The Central Coast Regional Water Quality Control Board's (CRWQCB) Basin Plan is silent on the issue of sediment contamination. Since these contaminants were not found during the water sampling effort, it is possible that they are fixed in the sediment matrix and would not be readily absorbed by aquatic organisms. These metals would not appear to play a significant role for survival of adult fishes and other free swimming aquatic organisms. However, to the extent that spawning activities would occur in sediments containing even these relatively low concentration levels, spawning success and fry survival could be negatively affected. Aquatic organisms which feed within the creek sediments could also be adversely affected. To the degree that these contaminants could bio-accumulate through the food chain, survival of aquatic organisms could be adversely affected. It is assumed that U.S. Fish and Wildlife Service fisheries biologists would have access to information regarding the significance of the reported concentrations of these metals on endangered steelhead.

## 7.2 County and City of Santa Barbara Joint Stormwater Pollution Prevention Plan (SWPP):

### 7.2.1 Background:

In anticipation of developing the SWPP and in response to information indicating occurrence of elevated levels of bacteria within South Coast area watersheds (CRWQCB 1991 and 1992), a watershed characterization study has been undertaken. The overall objective of the study is to establish baseline pollutant concentration levels to enable development of a comprehensive approach to improving watershed water quality. The study focus is on watersheds in the South Coast area and includes Arroyo Burro, Carpinteria, Mission, and Rincon Creeks. A brief letter report has been prepared summarizing the results of data analysis and presenting any




*Not to Scale*

**Figure 7.1-1**

**Vicinity Map and Sampling Locations**

proposed modifications to the study. The summary provides supportive rationale and recommends appropriate Best Management Practices for identified pollutants. All data is compiled and presented in a final report. Data will be compared to results from other studies in the state.

7.2.2 **Methodology**:

R The first of four sampling events to occur within each watershed began in August 1998. The first event was timed to occur concurrently with sampling events being conducted as part of the Southern California Coastal Water Research Project. The second sampling event took place during the "first flush" of the storm season because runoff from a season's first storm (of rainfall > 1/4") is considered to carry the highest pollutant concentrations of the year and is an important consideration in development of a SWPP. The third sampling event occurred mid-season (January) and the fourth event occurred at the end of the storm season (March). Sediment samples were taken during low flow conditions because it is under these conditions that pollutant levels would be most concentrated in the sediments. High flows have a tendency to wash the sediments and actually lower concentrations of even low solubility pollutants. Water samples were taken as specified during low flow conditions as well as immediately after the first storm of the season in an attempt to catch "first flush" pollutant runoff.

The timing of sampling events followed NPDES permit application guidelines. The baseline samples are collected during the dry season and the others are triggered by storm events. The guidelines require sampling periods to be a minimum of one month apart and specify that storm events not vary more than 50% from the historical average or median rain events.

Analyses included metals, general/physical characteristics, and nutrients. Analysis was not continued for constituents for which concentrations fall below the CRWQCB's Basin Plan Standards. Constituents which are present in concentrations greater than or equal to these standards will continue to be evaluated throughout the study.

Analyses for Mission Creek include: **Total Metals** - Cadmium, Chromium, Copper, Lead, Nickel, Zinc, and Mercury; **General/Physical**- Biological Oxygen Demand, Chemical Oxygen Demand, Total Organic Carbon, Free Oil and Grease, Oil and Grease (mineral): **Nutrients** - Total Phosphorous (P), Total Nitrogen, Nitrate, Nitrite, and Ammonia; and **Microbiological** - Fecal Coliform and Enterococcus.

There are 10 sampling locations along Mission Creek starting near the mouth and ending near the source. Two of the sampling locations on Lower Mission Creek coincide with those of the Corps effort. The sampling locations 1 and 2 coincide with the Corps sites # 1 and # 2 (Source: South Coast Watershed Characterization Workplan).

### 7.2.3 **Sampling Results**:

Analysis of samples taken at locations 1 and 2, on August 31, 1998, found no detectable concentrations of metals (with the exception of zinc concentrations) at or exceeding the detection limits established in the Corps study. No fecal coliform bacteria were detected.

Analysis of "first flush" samples collected on September 5, 1998 (sites 1 and 2) and September 6, 1998 (site 1), found no detectable concentrations of metals (with the exception of zinc) at or exceeding the detection limits established in the Corps study. Fecal coliform bacteria in excess of the maximum recommended CRWCB Standard for water contact recreation were found at both sites 1 and 2. The standard is 200/100ml of water and concentrations of 12,977 and 24,192 were found at site 1 on September 5 and 6, 1998 respectively. Concentrations of 2987 were found at site 2 on September 5, 1998. The maximum recommended CRWCB Standard for water recreation with no body contact is 2000/100ml.

Analysis of mid-season samples collected on January 28, 1999 (site 1) found no detectable concentrations of metals (with the exception of zinc) at or exceeding the detection limits established in the Corps study. Fecal coliform bacteria in excess of the maximum recommended CRWCB Standard for water contact recreation were found at both sites 1 and 2. The standard is 200/100ml of water and concentrations of 41,600 and 32,820 were found at sites 1 and 2, respectively, on January 28, 1999. The maximum recommended CRWCB Standard for water recreation with no body contact is 2000/100ml.

Analysis of end of the storm samples collected on March 16, 1999 (site 1) found no detectable concentrations of metals at or exceeding the detection limits established in the Corps study. Fecal coliform bacteria in excess of the recommended CRWCB Standard for water contact recreation were found at both sites 1 and 2. The standard is 200/100ml of water and concentrations of 9,208 and 3,076 were found at sites 1 and 2, respectively, on March 16, 1999. The recommended maximum CRWCB Standard for water recreation with no body contact is 2000/100ml.

## 7.3 **Water Quality at Lagoon**:

At the outlet of Mission Creek is a tidal lagoon. This lagoon portion of Mission Creek tends to accumulate debris and stagnant creek water because the flow of water is often insufficient to clear the sand "plug" at the mouth (City of Santa Barbara, 1981). This lagoon area, which accumulates the water which flows through the City of Santa Barbara, is likely to be of low water quality. Decomposing debris could cause lowered dissolved oxygen levels.

Mission Creek has been identified as a source of bacterial contamination to ocean waters during the winter months (CRWQCB, 1991). Table 7.1-2 compares bacterial input to the ocean from Mission Creek to other local sources.

Table 7.1-2
QUANTITY OF BACTERIAL INPUT
**(Unit of Measurement Bacteria per 100 ml of Water)**

| Location | Quantity (12/17/88) |
|---|---|
| Goleta Slough | 162,000.0 |
| Arroyo Burro Creek | 27,100.0 |
| Mission Creek | 19,600.0 |
| Santa Barbara Outfall | 19.5 |
| Goleta Outfall | 1.0 |
| Source: Goleta Sanitary District | |

7.3.1 **City of Santa Barbara Mission Creek Estuary Water Quality Monitoring Program**:

The City of Santa Barbara is conducted a water quality monitoring program of the Lower Mission Creek estuary. The objective of this water sampling effort was to provide baseline data which will be used to pursue a solution to the contamination, appearance and odor problems associated with the estuary. Water samples were obtained and analyzed on a weekly basis from November 1994 through October 1995. Water samples were obtained at two locations in the Mission Creek estuary: at the north side of the Cabrillo Boulevard Bridge; and at the north side of the State Street Bridge. These observations included, but were not limited to, the water level in the estuary, the condition of the sand bar, the extent of algal cover, odor, the amount of debris in the channel and any other unusual factors. Detailed water quality data and analysis results are located in Appendix F. It was estimated that some mixing was taking place during periods of low creek flow when high tides were present. This was illustrated by low salinity and conductivity readings. There was no unsightliness or foul odors associated with the creek at that time.

In late April and early May 1995, the creek flow receded and the height of the sandbar increased. The combination of these and other factors yielded increased salinity and conductivity, and decreased dissolved oxygen content in the estuary. Algal cover began to appear in mid-July. By August 3, 1995, the algal coverage had increased to about 40% of the lower estuary waters, with a corresponding drop in the dissolved oxygen content. High tides occurred on August 8-10, 1995, washing the algae out to sea. Measurements obtained a few days later revealed that the dissolved oxygen content had increased, as had salinity concentrations.

Based on this analysis, turbidity level was generally low within the creek between March and November, except during May. During the month of May, turbidity levels of 74.8 and 188 Nephelometric Turbidity Units (NTUs) were recorded. Figure 9-7 (Section 9, Biological Resources of this document) shows a graphical representation of turbidity levels in 1994 and 1995. Turbidity levels between April and November ranged from 0.76 to 14.8 NTUs (except May). Turbidity levels were recorded during the months of December to March. The increased turbidity levels resulted from winter rains/storms. The highest turbidity levels were recorded in February, ranging from 110 to 206 NTUs. Nevertheless, analyses indicated that turbidity levels were high only for few days, a maximum of about two weeks. After the storm was over, turbidity levels returned to normal and dropped to about 8.0 NTUs.

## 7.4 Ground Water Quality:

The proposed flood control project is located in the alluvial plain between the foothills south of the Mission Ridge-Arroyo Parida fault and the Pacific Ocean. This area is composed of two adjacent ground water basins, the Santa Barbara and the Foothill basin. The Santa Barbara Basin is adjacent to the Pacific Ocean, and the Foothill Basin is adjacent to the mountains.

Most of the rocks in the nearby mountains are sedimentary and are nearly impermeable except for some slightly permeable sandstones with occasional fracture zones. Neither is considered an important source of ground water.

Upper Mission and Rattlesnake Creeks are areas of interrupted streamflow, part of which seeps into the ground to recharge the groundwater basin to the south. The deposits underlying the Santa Barbara area have been divided into five zones. They include the shallow zone, upper producing zone, middle zone, lower producing zone, and deep zone. The shallow zone varies in thickness from 200 to 300 feet, and is not considered a source of good water. The groundwater in the uppermost zone tends to be polluted in urban areas.

Water generally stands all year long in Mission Creek from the railroad tracks and U. S. Highway 101 downstream to the Pacific Ocean. High ground water and/or tidal water will be encountered in this reach during construction.

The greatest recharge is reached in Mission Creek between Rocky Nook Park and Mission Street, a distance of 3.65 miles. Periodic releases from Gibraltar Reservoir are made to flush debris and for groundwater recharge. Downstream from Mission Street, much of the stream channel is concrete-lined, so less recharge occurs in this area. The capability for recharge due to infiltration into the streambed is also reduced as the stream flows across more fine grained deposits which naturally occur in the lower part of the drainage area. Throughout most of the basin, fine grained deposits present in the shallow zone confine or partly confine the underlying water producing zone. Clay layers present in the shallow zone also prevent significant groundwater movement between the upper water bearing units of the shallow zone, which contain saline groundwater, and the lower water bearing units of the shallow zone, which contain relatively low levels of chloride. Any recharge that would occur downstream of Canon Perdido Street would tend to be confined to the shallow zone, not allowing percolation into the upper and lower water producing zones.

The Corps' Geotechnical Branch conducted an investigation to examine the depth of groundwater within the project area. The investigation revealed that groundwater depths vary from ground surface to 10 feet below the proposed invert. The water level measurements indicate that groundwater from the shallow aquifer will be encountered during excavation of the project.

### 7.4.1 Seawater Intrusion:

Seawater intrusion at Santa Barbara has been jointly studied by the U. S. Geological Survey and the City of Santa Barbara since 1977. Eight monitoring wells have been constructed along the coast to provide an early warning of saltwater intrusion into each of the fresh water aquifers at two sites along the coast at Santa Barbara (Hutchinson, 1979). The rate of municipal

## Table 7.1-3
## Comparison of Stormwater Pollutant Concentrations in Lower Mission Creek
( Average Value of Sample Readings From Locations 1 & 2)

| Pollutant | Pre-Storm 8/31/98 | | Post-Storm 9/5/98 | | 11/28/98 | | 1/28/99 | | 3/16/99 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Loc 1 | Loc 2 | Loc 1 | Loc 2 | Loc 1 | Loc 2 | Loc 1 | Loc 2 | Loc 1 | Loc 2 |
| Total Coliform | 1600 | No Data | 24,192 | 24,192 | 241,920 | 241,920 | 46,110 | 20,980 | 241,920 | 198,630 |
| Fecal Coliform | No Data | No Data | 12,997 | 2,987 | 41,600 | 32,820 | 3,790 | 3,310 | 9,208 | 3,076 |
| BOD | 7 | No Data | 5.6 | No Data | 23 | No Data | ND | No Data | 8 | No Data |
| COD (MPN/100ml)* | 30 | No Data | 67 | No Data | 91 | No Data | 150 | No Data | 52 | No Data |
| Total P (ppm) | .45 | No Data | 1.40 | No Data | 3.3 | No Data | .57 | No Data | .64 | No Data |
| TKN (ppm) | .7 | No Data | 2.3 | No Data | 5.6 | No Data | 5.6 | No Data | .09 | No Data |
| $NO_2$+$NO_3$ (ppm) | 2 | No Data | 1.9 | No Data | 3.9 | No Data | 1.7 | No Data | .5 | No Data |
| Total Cu (ppm) | ND | No Data | ND | No Data | .02 | No Data | ND | No Data | No Data | No Data |
| Total Pb (ppm) | ND | No Data | ND | No Data | .02 | No Data | ND | No Data | No Data | No Data |
| Total Zn (ppm) | .02 | No Data | .05 | No Data | .11 | No Data | .01 | No Data | No Data | No Data |

* Most probable number per 100 ml.
** Parts per million.
*** When more than one reading was taken, the higher value is reported in this table.

Source: Joint Water Quality Study by County and City of Santa Barbara

Mission Creek has been identified as a source of bacterial contamination to ocean waters during the winter months (RWQCB, 1991). Table 6.1-3 compares bacterial input to the ocean from Mission Creek to other local sources.

pumping increased significantly, averaging about 7 acre-feet per day, from August 1978 through January 1980. This pumping caused the water levels in a large part of the Santa Barbara area to drop below sea level by January 1980. During July 1978, the ground water generally flowed southward toward the ocean, whereas by January 1980 the ground water began to flow northward away from the ocean. The U.S.G.S has stated in their study (Martin, 1984), that the northward ground water flow suggests that the increased pumping rate has created the potential for seawater intrusion in the coastal portion of the Santa Barbara area.

The study further stated that, in the past, the possibility of seawater intrusion into the deeper water-bearing deposits in the aquifers was thought to be remote because an offshore fault truncates these deeper deposits so that they lie against consolidated rocks on the seaward side of the fault. Results of the study indicate, however, that ocean water has intruded into the deeper water-bearing deposits and to a much greater extent than in the shallow part of the aquifer. Apparently, the offshore fault thought to be impermeable is not an effective barrier to seawater intrusion. The fault may be permeable, allowing ocean water to migrate along the fault zone and to come into direct contact with the water-bearing deposits at depth.

Each of the four water-bearing aquifers have been, and are still being, monitored for ground water quality. The highest chloride concentrations occur in the upper, middle and lower producing aquifers. The shallow aquifer, which will be the one affected by channel construction, has relatively low chloride concentrations. Logs have indicated that there are impermeable clay beds between this aquifer and the lower aquifers. The U.S G.S. sampled only two wells in the shallow zone in 1979 (Martin, 1984, see details in Geotechnical Appendix).

The City at one time maintained several wells near the coast, which increased saltwater intrusion problems. But in the last few years, these wells have either been capped or they are used for monitoring purposes only. In 1990, it was learned that the local interests had stopped pumping the domestic wells closest to the ocean and had developed new wells more than a mile inland, thus allowing the ground water level to rise in those portions of the basin closest to the ocean. The City manages groundwater differently than it did in the past and groundwater is also saved for drought conditions when other surface supplies are not available.

## 7.5 CITY OF SANTA BARBARA GENERAL PLAN AND LOCAL COASTAL PLAN GOALS AND POLICIES FOR WATER AND MARINE ENVIRONMENTS:

The following policies in the Water and Marine Environments Section of the City of Santa Barbara Local Coastal Plan and Policies apply to this project:

6.8 *The riparian resources, biological productivity, and water quality of the City's coastal zone creeks shall be maintained, preserved, enhanced, and where feasible, restored.*

6.9 *The City shall support the programs, plans and policies of all government agencies, including those of the Regional Water Quality Control Board with respect to best management practices for Santa Barbara's watersheds and urban areas.*

6.11 *Channelization, dams or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to: (1) Necessary water supply projects, (2) Flood control projects where no other method for protecting existing*

*structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) Developments where the primary function is the improvement of fish and wildlife habitat.*

These Policies will be considered during evaluation of viable alternatives. See Section 4, Plans and Policies, for analysis of these policies.

## 7.6 IMPACTS ON WATER RESOURCES:

Impacts to water resources would be considered significant if:

- the proposed project would consistently discharge pollutants into the creek during debris removal operations, thus reducing water quality;
- turbidity levels during excavation, construction, and periodic debris removal are significantly greater than levels encountered during floods on the creek and under anticipated future without project conditions;
- the proposed project would have a significant adverse impact on groundwater recharge or if the penetration rate of water is significantly reduced due to impervious cover at the creek bottom;
- discretionary development is inconsistent with the goals and policies of the City of Santa Barbara and Santa Barbara County's Water Quality Management Plans; or
- the proposed project is not in compliance with Federal, State, and local water quality regulations.

### 7.6.1 Alternative 1 - (No Action) Without Project Conditions:

In the past, sediment removal has been conducted after major storm events to provide flood protection to the City of Santa Barbara. Cleanouts have occurred over a period of about 8 to 10 days. Usually, sediment has been removed between April and October, when the water flow is minimal in the creek. These impacts have been short-term and temporary. Under the No Action Alternative, there would be no project-related change in the baseline conditions found in the water and sediment sampling efforts discussed above. To the degree that the City and County of Santa Barbara are successful in developing and implementing BMPs for reduction of stormwater-related pollution of Lower Mission Creek, concentrations of contaminants could be expected to decrease over time.

### 7.6.2 Alternatives 12, 6 and 8:

Excavation of the existing creek bed and banks would result in short-term impacts to water quality; turbidity levels would increase due to channel removal and excavation. However, construction activity would occur during the non-flood season. Impacts would be short-term and localized. Turbidity levels would also increase during periodic future debris removal operations which could take from 8 to 10 days to accomplish. Impacts would be short-term and localized and would not exceed turbidity levels encountered under future without project conditions.

Measures would be followed during both construction and future debris removal to minimize impacts from turbidity. For example, if water is present in the creek during construction and future sediment removal operation, creek flow would be diverted by installation of a pipe or construction of a low flow channel. Water for the project would be obtained from City of Santa Barbara sources. No polluted material would be placed in the creek. The contractor would be responsible for the cleanup of any oil or grease spilled during construction. Periodic future debris removal is not anticipated to impact groundwater recharge. With utilization of appropriate construction methods and adherence to debris removal permit requirements, Alternatives 12, 6 and 8 would not have a significant impact on water resources of the project area.

If conditions at the time of construction warrant, turbidity levels would be monitored and measures developed to ensure that levels are minimized. No polluted sediments or other material would be placed in the creek. Measures to avoid/contain spills of oil and grease would be incorporated into the project plans; the contractor would be responsible for cleanup of any oil or grease spills from construction equipment.

### 7.6.3 **Future Periodic Maintenance**:

It is assumed that future periodic sediment removal would be similar to the past maintenance of the creek within the project reach. It may take about 8 to 10 days at intervals that depend upon debris deposited within the creek by flood events. The anticipated increase in turbidity during debris removal operations would be similar to levels experienced during past debris removal operations (without project conditions). Construction measures, including the use of low flow channels, would be incorporated into the project to minimize turbidity and other water quality impacts to project area resources.

R The effects of future maintenance activities within the creek can be estimated, but cannot be known with precision until such activities are actually undertaken. Sampling in Lower Mission Creek has shown that turbidity typically increases within the creek during high flow events and then rapidly returns to lower concentrations when flows subside. Maintenance activities will be timed to coincide with low flow periods and BMPs will be employed to avoid excessive impacts to water quality.

### 7.6.4 **Impact on Ground Water Recharge:**

The creek banks would be stabilized using stepped walls, vertical walls or vertical walls with riprap. However, sideslope protection would not result in a decrease in water percolation through the sideslopes because existing sideslopes consist of various types, which include concrete wall, gabion, sand bags, armaflex, etc. In addition, most of this percolation or seepage would continue through the natural creek bed. Construction and periodic debris removal are not anticipated to have an appreciable effect on the amount of groundwater recharge through the project reach.

The impact on seawater intrusion will be almost nothing if the Corps of Engineers constructs the aforementioned channel improvements in the reach of Mission Creek from Canon Perdido Street to Cabrillo Boulevard Water generally stands all year long in the lower reach of the creek from the railroad tracks downstream to the ocean. Therefore, seawater intrusion by

tidal action has probably already occurred in that portion of the shallow aquifer which underlies this reach of Mission Creek. The effects of any further seawater intrusion into this aquifer will be minimal because this aquifer is: (1) located close to the ground surface, (50 to 200 feet deep); (2) is subject to surface pollution; (3) is not being used for domestic water supply; and (4) there is little hydraulic continuity between this aquifer and the underlying highly pumped zones. In addition, no permeable faults are expected to be intercepted by the temporarily extended construction-induced tidal flow up the channel.

The various studies indicate that improvement of the channel between Canon Perdido Street and the Pacific Ocean will have a negligible effect on ground water recharge.

### 7.6.5 **Compliance with Environmental Laws and Permit Requirements**:

The USACOE does not issue itself a permit for civil works projects. Therefore, a Section 404 (b)(1) analysis is prepared and included in the EIS/EIR, Appendix F. Section 404(b)(1) addresses project-related impacts to the waters of the United States. A future maintenance plan is included in the EIS/EIR, and impacts related to future maintenance are identified. Mitigation measures for project construction and future maintenance for the life of the project are included in the Final EIS/EIR for water, coastal and biological resources. Future maintenance will be performed by the Local Sponsor. The Environmental Resources Branch has coordinated with the Regulatory Branch, Ventura Field Office, on the requirement for the Section 404, Water Quality General Permit. The USACOE is planning to coordinate with the Regulatory Branch throughout construction of the proposed project.

R On December 20, 1999, Santa Barbara County submitted an application for a Section 404, USACOE Regulatory, permit with the Draft EIS/EIR (Appendix E-1). A General Permit could be renewable at intervals of 5 to 10 years or Section 404, Regulatory Permit, or Section 404, Regulatory permit could be waived.

Section 404(r) of the Clean Water Act, waives the requirement to obtain either the State Water Quality Certification or the 404 permit if (ER 1105-2-100, April 22, 2000):

a. Information on the effects of the discharge of dredged or fill material into waters of the Untied States, including the application of the section 404(b)(1) Guidelines, are included in an EIS on the proposed project; and,

b. The EIS is submitted to Congress before the actual discharge takes place and prior to either authorization of the proposed project or appropriation of funds for its construction.

c. District commander shall clearly document in the feasibility report when the 404(r) exemption criteria have been met, regardless of whether or not he plans to obtain State Water quality Certification.

R Future maintenance is an integral part of the project design, impacts and mitigation

measures for future maintenance are included in the Final EIS/EIR. The EIS/EIR would be submitted to Congress for authorization of the project construction and appropriation of funding. Therefore, the proposed future maintenance activities could be waived from obtaining a Section 404 Water Quality permit governed by the USACOE Regulatory Branch.

R On December 20, 1999, the USACOE and the Santa Barbara County Flood Control District submitted a request for a waiver from the Section 401 Water Quality Certification (Appendix E-1) for the proposed project. Future maintenance is a part of the project. For the life of the project, impacts related to the future maintenance are included in the EIS/EIR. By letter dated February 2, 2000, the California Regional Water Quality Control Board (CRWQCB) provided a waiver from the Section 401 Water Quality Certification for the project construction and the future maintenance (Appendix E-1).

A Storm Water Pollution Prevention Plan will be prepared to meet Section 402 Clean Water Action and National Pollutant Discharge Elimination System (NPDES) Storm Water Program requirements prior to the project construction. The selected construction contractor will prepare a Storm Water Pollution Prevention Plan to reduce erosion and degradation to waters of the United States. The local sponsor is involved in this project; therefore, a 1603 Streambed Alternation permit would be required prior to construction and the County of Santa Barbara would need to submit an application to the California Fish and Game for the Streambed Alternation Permit. With completion of these actions, the project will be in compliance with Federal and State water quality requirements.

### 7.6.6 MITIGATION OF POTENTIAL WATER QUALITY IMPACTS:

- *Impact:* Increased turbidity during construction.

  *Mitigation:* The creek channel upstream of construction activity shall be dammed temporarily to prevent water from entering the reach under construction. A diversion pipe shall be installed in the dam to convey any creek water around the construction area for discharge downstream of the construction activity.

- *Impact:* Short-term impacts to surface water quality from fuels, solvents, and lubricants associated with construction equipment.

  *Mitigation:* Equipment shall be in proper working condition and inspected for leaks and drips on a daily basis prior to commencement of work. Corps shall develop and implement a spill prevention and remediation plan and workers shall be instructed as to its requirements. Construction supervisors and workers shall be instructed to be alert for indications of equipment-related contamination such as stains and odors. Construction supervisors and workers shall be instructed to respond immediately with appropriate actions as detailed in the spill prevention and remediation plan if indications of equipment-related contamination are noted. Construction equipment shall only be operated within dewatered areas of the creek. No

maintenance of construction equipment shall be carried out in the creek bed.

*Impact:* Project construction and future sediment removal may result in increase in the turbidity levels.

*Mitigation:* No construction or sediment removal would occur anywhere within the project area between December 1st and March 30th. Details of these mitigation measures include:

1) Pipe culverts will be placed in the low flow stream where the stream must be crossed on a regular basis. No work will be allowed in the flowing water except as absolutely necessary (as determined by the Flood Control District).

2) Construction of temporary low-flow channels within the creek during debris removal operations to minimize turbidity and provide habitat for aquatic species. The low-flow channels would be constructed around and away from debris removal operations. Project biologists would develop criteria for the low-flow channels.

3) Conditions identified in the applicable permits and 1601/1603 Streambed Alteration Agreement) shall be followed during construction and future maintenance as applicable.

R Impact: Stockpiled soils could erode and contaminate Lower Mission Creek.

*Mitigation:* Stockpiled soil needs to be placed sufficiently far back from the creek that erosion control measures can be employed. During construction, USACOE intends to employ Best Management Practices ( BMPs) to control erosion and associated sedimentation of the creek. Measures such as use of sediment control mesh and covering of stockpiles are among possible BMP's that would be employed to protect the creek. A Storm Water Pollution Prevention Plan (SWPP) will be prepared by the USACOE or the Construction Contractor, which would include methods or conditions for erosion control occurring due to the project construction. This document would be available on the construction site.

R **<u>MITIGATION MEASURES FOR FUTURE MAINTENANCE</u>:**

- All routine maintenance shall be accomplished between August and mid-October.
- A pair of silt curtain fences shall be set across the low flow not more than 100 yards downstream of the work area; the fences shall be approximately 10 yards apart.

R
- If storm events do not reduce conveyance more than 15% then the next maintenance cycle shall involve only mowing of vegetation.

R • During those maintenance cycles when the County determines silt removal has become necessary, all plants and deposits would be removed. As the final step during maintenance, the pilot channel would be rebuilt following the path where a natural channel had gradually come into being, or where the pilot channel had been if hydraulic processes have not already shifted and reshaped it.

R • A swath half the channel wide shall then be mowed or brushed to suppress the growth of potentially large perennials, first along one side as seems convenient for an arbitrary distance (say, 250 feet), then switching to the opposite bank for another arbitrary distance. The pilot channel would not be disturbed.

R • If sediment removal is not needed the year after, then the other half of the channel would be mowed and brushed. The pilot channel would not be disturbed.

R • If storm events of the next winter rains leave enough sediments to warrant their removal, then during the following summer the full width of that section of the creek would be groomed to remove obstructing sediments and plants. The pilot channel would be rebuilt where a natural channel had gradually come into being, or where the pilot channel had been if hydraulic processes have not already shifted and reshaped it.

1. No discharge of oil or spill of contaminated material should be allowed within the creekbed (conditions identified above would be followed during the future maintenance.

2. BMPs will be employed to avoid excessive impacts to water quality.

## 7.7 RESIDUAL IMPACTS:

Project impacts on water quality due to both construction and future sediment removal are anticipated to be adverse, but short-term and localized. With utilization of the mitigation measures outlined above to reduce turbidity and avoid spills, impacts are expected to be less than significant.

# SECTION - 8 - AIR QUALITY

## 8.1 EXISTING AIR QUALITY:

The State of California has established ambient air quality standards to protect human health. The federal government has also established health-based standards ("primary" standards), which are generally less protective of public health than state standards. In addition, the federal government has established "secondary" standards to protect public welfare. State and federal standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulate matter 10 micrometers or less in size ($PM_{10}$), and lead. On July 18, 1997, a new federal standard was promulgated for ozone (8-hour) and suspended particulate matter 2.5 micrometers or less in size ($PM_{2.5}$). California has additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. All applicable standards are shown in Table 8.1.1. Monitoring of ambient air pollutant concentrations is conducted by the California Air Resources Board (ARB), the Santa Barbara County Air Pollution Control District (APCD), and industry.

The area affected by project emission sources would generally include the City of Santa Barbara. On December 10, 1997, the U.S. Environmental Protection Agency (EPA) reclassified the Santa Barbara County one-hour ozone non-attainment area from "moderate" to "serious." That action precipitated the requirement to establish a Photochemical Assessment Monitoring Station (PAMS) program. Of the three different types of PAMS sites, the APCD will initially be required to install a Type II site on the south coast of Santa Barbara County. The objective of a Type II site is to monitor for maximum ozone precursor emissions.

Ozone is a secondary pollutant formed in the atmosphere by photochemical reactions of previously emitted pollutants called precursors. Ozone precursors are mainly reactive organic gases (ROGs) in the form of hydrocarbons, and nitrogen oxides ($NO_x$). ROGs are gaseous forms of reactive organic compounds (ROCs) and do not include methane or other non-reactive methane and ethane derivatives. $NO_x$ is the designation given to the group of oxygenated nitrogen species, with nitric oxide (NO) and $NO_2$ being the most commonly occurring compounds in the atmosphere.

The region of influence for ozone ($0_3$) may extend much farther downwind than for inert pollutants. In the presence of solar radiation, the maximum effect of precursor emissions on ozone levels usually occurs several hours after they are emitted and, therefore, many miles from the source. Ozone and its precursors transported from other regions can also combine with local emissions to produce high local ozone concentration. Therefore, depending on the meteorological conditions, the region of influence for $O_3$ could include much of Santa Barbara County.

Table 8.1-1
NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

| *Pollutant* | *Averaging Time* | *California Standards*[a,c] | ---------NATIONAL STANDARDS[b]--------- | |
|---|---|---|---|---|
| | | | *Primary* [c,d] | *Secondary*[c,e] |
| Oxidant (ozone) | 1-hour | 0.09 ppm (ug/m$^3$) | 0.12 ppm (235 ug/m$^3$) | Same as primary |
| Carbon Monoxide | 8-hour<br><br><br>1-hour | 9.0 ppm (10 mg/m$^3$)<br>20 ppm<br>23 mg/m$^3$) | 9 ppm (10 mg/m$^3$)<br>35 ppm<br>(40 mg/m$^3$) | ---<br><br><br>--- |
| Nitrogen dioxide ($NO_2$) | Annual<br><br>1-hour | ---<br><br>25 ppm (470 ug/m$^3$) | 0.30 ppm (100 ug/m$^3$)<br>— | Same as primary<br><br>--- |
| Sulfur dioxide | Annual<br><br>24-hour<br><br>3-hour<br><br>1-hour | ---<br><br>0.04 ppm (105 ug/m$^3$)<br>—<br><br>0.25 ppm (655 ug/m$^3$) | 0.03 ppm (80 ug/m$^3$)<br>0.14 ppm (365 ug/m$^3$)<br>—<br><br>— | ---<br><br>---<br><br>0.5 ppm (1,300 ug/m$^3$)<br>— |
| $PM_{10}$ | Annual<br>24-hour | 30 ug/m$^3$[f]<br>50 ug/m$^3$ | 50ug/m$^3$[g]<br>150 ug/m$^3$ | ---<br>Same as primary |
| Sulfates | 24-hour | 25 ug/m$^3$ | --- | --- |
| Lead | 30-day<br>Quarterly | 1.5 ug/m$^3$<br>— | ---<br>1.5 ug/m$^3$ | --<br>Same as primary |
| Hydrogen sulfide | 1-hour | 0.03 ppm (42 ug/m3) | --- | --- |
| Vinyl chloride | 24-hour | 0.010 ppm (26 ug/m3) | --- | --- |
| Visibility reducing particles[h] | 8-hour (10 A.M. to 6 P.M. PST) | In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent. | --- | --- |

*Source*: California Air Resources Board 1999. *California Air Quality Data, Summary of 1994 Air Quality Data for Gaseous and Particulate Pollutants.* Annual Summary, Vol. XXVI, Technical Support Division.
*Notes: See Page 8-3*

Notes:
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 standards are not to be equaled or exceeded.
b. National standards, other than ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained then the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
c. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 20°C and a reference pressure of 760 mm of mercury (1,013.2 millibars). All measurements of air quality are to be corrected to a reference pressure of 760 mm of mercury; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after the Environmental Protection Agency approves that state's implementation plan.
e. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the EPA approves the implementation plan.
f. Measured as a geometric mean.
g. Measured as an arithmetic mean.
h. 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 when relative humidity is less than 70 percent.

### 8.1.1 Santa Barbara County Air Pollution Control District Annual Air Quality Report (1996):

The state and federal governments have established ambient air quality standards for several pollutants. These standards, based on scientific and medical research, tell APCD how much of each pollutant can be in the air without causing harm. The APCD is required to monitor air pollution levels to ensure that air quality standards are met and, if they aren't, to develop a strategy to reduce air pollution so they can be met.

Santa Barbara County's air quality has historically violated both the state and federal standard for two air pollutants: ozone and particulate matter. The air does not meet the state and federal health-based standards for ground-level ozone, and does not meet state standards for particulate matter.

Santa Barbara County's air quality is improving, as measured ozone concentrations continue to decline. In 1997, for example, the monitoring stations recorded only 10 exceedances of the more stringent state ozone standard and only one exceedance of the federal ozone standard. This represented the cleanest year on record. During 1998, Santa Barbara experienced 15 exceedances of the state 1-hour ozone standard and two exceedances of the federal 1-hour ozone standard. The state and federal ozone standard exceedances from 1988 through 1997.

The 1998 Clean Air Plan (1998 CAP) was prepared by APCD to satisfy various mandates of the 1990 federal Clean Air Act Amendments (FCAAA) and the California Clean Air Act of 1988. Section 182(c) of the FCAAA requires all "serious" non-attainment areas to prepare a plan to reduce ozone forming pollution, and provide a demonstration that the control strategy proposed in the plan will result in the attainment of the federal 1-hour ozone standard by 1999. The latest state and Federal Clean Air Act requirements that apply to Santa Barbara County are provided below:

Section 182(c)(2)(A) Attainment Demonstration – This 1998 CAP must demonstrate attainment of the federal 1-hour ozone standard by November 15, 1999, based on photochemical grid modeling. Section 172(c)(1) also requires attainment of the standard, but does not specify the model to be used for the demonstration.

Section 182(c)(2)(B) Post-1996 Rate of Progress – The APCD must submit a plan to the U.S. EPA by January 9, 1999, that provides for at least a 9 percent reduction in VOC emissions from 1996 through 1999. This is in addition to the 15 percent reduction required by 1996 under Section 182(b)(1) for a total reduction of 24 percent by November 15, 1999. Overall, the Plan demonstrates that Santa Barbara will attain the federal 1-hour ozone standard by 1999.

In light of new public health data, the U.S. EPA has issued new federal standards for ozone and particulate matter. The new federal ozone standard will be based on an 8-hour averaging time; it will replace the 1-hour ozone standard once it is attained. Attainment and non-attainment designations for the 8-hour ozone standard are expected by July 2000. The U.S. EPA also established a new fine particulate standard ($PM_{2.5}$) for both short-term (24 hour) and long-term (annual) averaging periods, as well as changing the form of the existing $PM_{10}$ standard. Attainment and non-attainment designations for the new fine particulate standards are expected between 2002 and 2005.

### 8.1.2 Historical Air Quality:

Air quality monitoring in Santa Barbara County began in the mid 1970's when State and Local Air Monitoring Stations (SLAMS) were installed in the most populated areas of the county. The SLAMS monitors are located to provide local and regional air quality information. Between 1986 and 1988, in preparation for major oil and gas facility construction and operation, Prevention of Significant Deterioration (PSD) stations were added to monitor facility-specific and regional air quality. PSD stations are required by the APCD to ensure that new and modified sources under APCD permit do not interfere with the county's ability to attain and maintain air quality standards. In general, 1986 is the start date APCD uses to evaluate the overall air quality trends in Santa Barbara County.

On December 10, 1997, the U.S. EPA reclassified the Santa Barbara County one-hour ozone non-attainment area from "moderate" to "serious." That action precipitated the requirement to establish a Photochemical Assessment Monitoring Station (PAMS) program. This program involves collecting low-level (3,500 feet) upper-air meteorological measurements utilizing an upper-air radar wind profiler, ten meter wind speed and direction, atmospheric temperature, relative humidity, total solar and sky radiation, barometric pressure, carbonyl sampling, speciated hydrocarbon sampling (72 compounds), and oxides of nitrogen and ozone measurements.

In addition to the APCD's PAMS program, the ARB will be conducting $PM_{2.5}$ monitoring at their downtown Santa Barbara and Santa Maria sites beginning in 1999. A third sampler is to be installed and operated near the San Rafael Wilderness by the federal land manager in the year 2000.

Inhalable particulate matter ($PM_{10}$) is source specific, wind dependent, and sampled only once every sixth day. For these reasons, it is not as good an indicator of overall air quality as ozone. However, it also shows an improving trend. The number of exceedances of the state $PM_{10}$ standard has declined from a high of 17 in 1989 to only 9 in 1993, 1994 and 1995. In 1986 and 1987, the $PM_{10}$ monitoring network was incomplete.

The state (1-hour) and federal (1-hour and 8-hour) ozone standard exceedances measured in the county from 1988 through 1997 for all monitoring stations in continuous operation during the last 10 years. Both federal and state ozone standards have been exceeded in recent years. In fact, the entire South Central Coast Air Basin encompassing San Luis Obispo, Santa Barbara, and Ventura Counties has been designated non-attainment for the state ozone standard. Santa Barbara County experiences between 10 and 42 days per year on which the state ozone standard is exceeded and 1 to 9 days per year on which the federal 1-hour standard is exceeded.

In addition to the federal 1-hour ozone standard, the U.S. EPA has promulgated (July 18, 1997) a new 8-hour ozone standard (0.08 ppm) that is generally more protective of public health. Compliance with the new standard is judged by taking the average of the 4$^{th}$ highest 8-hour concentration, each year, for a 3 year period. Transition to the new 8-hour ozone standard will occur over the next few years. Areas must first achieve the 1-hour ozone standard before that standard is officially revoked and replaced by the new 8-hour ozone standard.

The California 24-hour $PM_{10}$ standard (50 micrograms per cubic meter or ug/m3) has been measured consistently at both SLAMS and PSD stations since 1986. The maximum 24-hour average concentration measured each year and the annual geometric mean for the Santa Barbara and Santa Maria SLAMS sites. Both the state 24-hour and annual $PM_{10}$ standards are violated in the county. However, the county is in compliance with the federal 24-hour $PM_{10}$ standard.

On July 18, 1997, EPA revised the primary and secondary air quality standards for particulate matter by establishing annual and 24-hour $PM_{2.5}$ standards and revising the form of the existing 24-hour $PM_{10}$ standard. The new standards for $PM_{2.5}$ are set at 65 ug/m3 for 24-hour and 15 ug/m3 for an annual average. Since $PM_{2.5}$ is not currently being monitored in Santa Barbara County (or throughout the nation), the first step in addressing the new standard is the establishment of a monitoring program. U.S. EPA will be designating attainment and non-attainment areas (action expected between 2002 and 2005) with State Implementation Plans due starting in the year 2005.

### 8.1.3 Federal Statutes and Regulations:

The CAA Amendments of 1990 (1990 CAA) revised the planning provisions for areas that do not meet the NAAQS. The 1990 CAA identifies new non-attainment classifications and compliance dates, specific emission reduction goals, a demonstration of reasonable further progress and attainment, and incorporates more stringent sanctions for failure to attain or meet interim milestones. The requirements and compliance dates for reaching attainment are based

upon the severity of non-attainment classifications. Since Santa Barbara County is a serious $O_3$ non-attainment area, the APCD is required to design a plan that will bring the region into attainment by November 15, 1999.

For the 1994 through 1996 period, 3 sites in South County were in violation of the federal 1-hour ozone standard prompting U.S. EPA to reclassify all of Santa Barbara County as a "serious" non-attainment area. While 1997 was the cleanest year on record, additional efforts are needed to continue progress toward the goal of providing clean air for the residents of Santa Barbara County by achieving attainment for all applicable state and federal ambient air quality standards.

### 8.1.4 State Regulations:

The California Clean Air Act (CCAA) was signed into law on September 30, 1988. Key requirements of the law that this Plan addresses are the Triennial Progress Report (H&SC Section 40924(b)) and the Triennial Plan Revision (H&SC Section 40925 (a)). Additionally, the Plan must provide an annual 5% emission reduction of ozone precursors, or, if this cannot be done, include every feasible measure as part of the emission control strategy.

Similar to the federal system, the CCAA requirements and compliance dates for reaching attainment are based upon the severity of non-attainment classifications. The CAP details how the current attainment planning process satisfies both Triennial Progress Report and Plan Revision requirements for the state O3 standard, as mandated by the CCAA.

### 8.1.5 Santa Barbara County Regulations:

APCD Rule 303 - Nuisance. This rule states that a person shall not discharge air contaminants from any source that causes injury, detriment, nuisance, or annoyance to any considerable number of persons or that endanger the comfort, repose, health, or safety of any such persons or their business or property. The APCD considers emissions of air pollution to be a significant nuisance if five or more complaints are received from different individuals/ households within 20 hours or 10 such complaints are received within 10 days.

Rule 702 - General Conformity. This rule adopts the federal conformity rule and includes requirements to enforce mitigation measures used to support a positive conformity determination.

## 8.2 CITY OF SANTA BARBARA AIR QUALITY GOAL:

The City Conservation Element Air Quality Goal is:

*Maintain air quality above Federal and State ambient air quality standards.*

## 8.3 CLIMATE:

The climate of the project area is Mediterranean, characterized by warm, dry summers and cooler, relatively damp winters. The major influence on the regional climate is the Eastern Pacific High, a strong persistent high-pressure area. Seasonal variations in the position and strength of this system are a key factor in producing weather changes in the area.

### 8.3.1 **Visibility**:

Ground-level fog limits visibility to less than one-quarter of a mile on an average of 20 days per year at the Airport (NOAA 1994). These conditions are most frequent during the fall and early winter months.

### 8.3.2 **Temperature**:

Due to the moderating effect of the Pacific Ocean and lower elevation, temperatures are less extreme along the coastal sections of the project area compared to more inland locations. Maximum temperatures during the summer months average in the 70s (degrees Fahrenheit) along the coast to the high 80s in the interior valleys. Minimum summer temperatures average in the 50s to low 60s over most of the project area. Maximum temperatures during the winter months average in the 60s. Minimum winter temperatures are usually in the 30s and 40s in the project area.

### 8.3.3 **Wind Speed And Direction**:

The prevailing wind flow along the coast of Central California is from the northwest. However, due to the blocking effect of the Santa Ynez Mountains and deflection of these winds around Point Conception, daytime sea breezes are usually from the southeast to southwest along the southern Santa Barbara County coast. Light northeasterly land breezes usually occur at night. These land breezes may extend many miles offshore during the colder months of the year until daytime heating reverses the flow back onshore. High pollutant impacts can occur during these conditions, when pollutants transported offshore at night combine with local emissions onshore the following morning with the onset of the sea breeze.

Another situation that can lead to high pollutant concentrations in the project area results from the buildup of high pressure in the Great Basin and is known as a "Santa Ana" condition. This condition can produce strong northeast winds in Southern California, but, in general, light southerly winds occur in the project area. Santa Ana conditions frequently transport pollutant-laden air from the Los Angeles urban area to Santa Barbara County. Since stagnant atmospheric conditions often occur in Santa Barbara County during a Santa Ana, local emissions combined with pollutants transported from Los Angeles can lead to significant $O_3$ impacts in the region.

### 8.3.4 **Precipitation**:

Over 90 percent of the total annual precipitation in the project area occurs from November through April. Annual precipitation is approximately 18 inches at the coast and increases to 30+ inches in the Santa Ynez Mountains.

Although the overwhelming majority of precipitation in the project area is produced by winter storm systems from the north Pacific, summer tropical moisture can also produce clouds and rainfall. However, precipitation from tropical air masses is rare and usually occurs only from July through September.

## 8.4 IMPACTS ON AIR QUALITY:

Long-term air quality impacts in the Lower Mission Creek project site area would not be more significant than the current pollution emissions. The proposed short-term project construction will take place over two years and only utilize 189 days each year. Although quantitative thresholds of significance are not currently in place for short-term emissions in Santa Barbara, daily air quality impact thresholds were based on construction exhaust and fugitive emissions from the South Coast Air Basin (SCAB) and Coachella Valley area. If emissions on an individual day exceed 75 lbs. a day for ROC, 100 lbs. a day for NOx, 550 lbs. a day for CO, or 150 lbs. a day for PM10, the project impacts would be considered significant. Also, APCD requires that the construction emissions not exceed 25 tons per year. Based on summary Table 8-4.6-1 in Section 8.4.4, the proposed project will not induce any short-term significant impacts and, therefore, conforms with the Federal Clean Air Act as amended 1990 and the 1998 Clean Air Plan for Santa Barbara County Air Pollution Control District.

### 8.4.1 No Action Alternative No. 1 (Without Project Conditions):

Under the No Action Alternative, maintenance activity would be similar to the past maintenance performed by the Santa Barbara County. In the past, maintenance has been performed after major storm events to provide flood protection to the City of Santa Barbara. On average, maintenance has occurred at intervals of 2 to 3 years. Santa Barbara County has performed maintenance of the creek to protect the surrounding residential and commercial areas from temporary flooding. The quantity of material removed for each clean out has been dependent on the storm season, but has amounted to approximately 40 to 80 cy of material per day. The material has been transported to a disposal site, taking 4 to 8 truck trips (20 cy per truck load). Sometimes, the selected contractor has provided material to Caltrans or other construction facilities. However, material has been distributed within about a 10-mile radius of the project site. Debris removal operation has taken about 10 to 15 days per season. Emissions generated by these activities have been negligible; therefore, they have not contributed any adverse impacts to the air quality.

### 8.4.2 Alternatives 12, 6 and 8:

Three alternatives were identified as possible solutions to reduce flooding problems in the Lower Mission Creek Area. All are very similar in nature, but have different capacities and alignments. Alternative 12, the recommended solution, was chosen as the alternative upon which to base emission calculations. Emissions calculations would be very similar for Alternatives 6 and 8.

Alternative 12 would create short-term emissions. Project-related activities that would contribute to emissions include: removal of existing banks; channel excavation; and transporting material from the creek bed to the staging area. These impacts on air quality, however, are not expected to exceed air pollutant threshold values and should be temporary (189 days per year for up to four years). Emission calculations in Appendix G show that all parameters either meet or are lower than threshold limits.

R The total amount of material to be excavated from creek banks and creek bottom would be about 82,000 cubic yards (cy). Creek excavation would occur section by section. Therefore,

all 82,000 cy of material would not be stockpiled at one time. About 17,000 to 18,000 cy of material would be utilized in project construction as fill material. The remaining 64,000 cy of excavated material can be stockpiled or be taken to a county yard for storage or recycling depending on whether it meets project specifications. The material could be distributed to other construction sites requiring fill. It is assumed that a very small amount of excess material would be transported within a radius of about 10 to 25 miles from the project site. A maximum of about 30,000 to 40,000 cy of material would need to be transported to disposal sites, either at the Tajiguas Landfill, located 25 miles west of the project site, or used in a reclamation site (if one exists at the time of construction). About 1,500 to 2,000 truck trips would be required to transport the excavated material. Channel excavation may last for about 130 to 180 days; however, excavation and construction activities, including bank stabilization and construction of bridges etc., would be accomplished at the same time. The construction would be performed in segments. The estimated time frame for project construction is about two years. It is assumed that about 10 to 15 truck trips would be required per day to transport excavated material to the staging or stockpile area or disposal sites.

During excavation some of the material would be used as a fill material and the remainder would be disposed at a disposal site. The material would be transported from the creek bed to the staging area located along the creek banks. This distance is about ¼ mile from the project site. To further minimize impacts on air quality, mitigation measures would be implemented. These would include watering unpaved roads, limiting truck speeds to 15 miles per hour on unpaved roads, watering the construction site as well as stockpiled material, ceasing construction during high wind velocity and covering stockpiled material and material transported in haul trucks.

### 8.4.3 **Future Sediment Removal**:

After project construction is completed, maintenance of the creek would be required to maintain channel capacity. Future maintenance of the channel would be similar to the past maintenance or debris removal operation. In the past, Santa Barbara County removed material from the project reach area on an average of about two to three every years. The change from existing conditions to design conveyance capacity would alter the net sediment budget for the entire project very slightly. A net total of 25 $yd^3$ should accumulate each time the creek carries an average storm event. In contrast, individual higher peak flows should promote net erosion from the streambed, 35 $yd^3$ during a 5-year storm event and roughly ten times that quantity removed during a single design event. Future sediment accumulation is dependent upon the size and number of storm events. However, future maintenance would be similar to the existing maintenance performed by Santa Barbara County. As an example of maintenance activities, the last time the County removed sediments about 350 $cy^3$ between Canon Perdido Street and Highway 101 in the summer of 1997.

Future debris removal would increase fugitive dust due to excavation of the material. About 4 to 8 truck trips per day would be required to transport the sediment to a disposal site or material could be distributed to construction sites needing the material. However, these impacts would be similar to without project conditions. They would be temporary and conditions would be stabilized after maintenance is completed.

R 8.4.4 **Summary of Air Quality Analysis**:

Evaluating the air quality impacts associated with the proposed Lower Mission Creek Flood Control Improvement Project is separated into two separate analyses. First, are the temporary, short-term emissions generated during project construction, which include exhaust emissions from heavy equipment operation associated with grading, and excavation activities, and personnel and trucks commuting back and forth to the proposed site. Second, are the fugitive emissions generated by the bulldozer operation and trucks traveling on paved and unpaved roads. Each of these analyses are performed separately and then combined to arrive at total emission estimates related to both operations. The quantity of material was based on total excavated material of 82,000 cubic yards. The construction would occur reach by reach; therefore, all excavated material would not be stockpiled or transported at one time. About 17,000 to 18,000 cy of material would be used as a fill for the construction of the project. Some of the material would be recycled, therefore, most likely about 30,000 to 40,000 cy of material would need to be transported to a disposal site or construction sites located in the vicinity of the project area. However, the air quality analysis is performed for 64,000 cy of material to be transported to the disposal sites or construction sites, in case sites are not available in the immediate project vicinity.

Estimation of air quality impacts was performed under the guidance of the South Coast Air Quality Management District (SCAQMD), using methods prescribed in the 1993 California Environmental Quality Act (CEQA) Air Quality Handbook published by the SCAQMD. Although quantitative thresholds of significance are not currently in place for short-term emissions in Santa Barbara, CEQA requires that short-term impacts be discussed in the environmental document. Emission factors were obtained from the 1993 CEQA Air Quality Handbook (SCAQMD) using Tables A9-8-A,B,C,&D; A9-5-K-5; and A9-9-B, C, D, and F. These calculations were based on worse case scenarios using transportation of about 64,000 cy of material. Project related air quality calculations are located in Appendix G.

A summary of emissions generated due to project construction is presented in Table 8.4.6 -1. Particulate matter generated by the construction activities would be about 100 pounds per day; this increase is below the daily thresholds levels. Mitigation measures identified in Section 8.4.6 would be implemented to minimize release of fugitive dust. Project-related emissions would contribute minor quantities of Carbon Monoxide (CO), Reactive Organic Compounds (ROC) and Oxides of Nitrogen (NOx) and other pollutants to the air. Construction and future sediment removal related emissions are short term, and conditions will stabilize after completion of the project. Emissions generated by the future sediment removal would be negligible, and would be insignificant. The impacts would be short-term, temporary, and adverse, but not significant.

### 8.4.5 Requirements of Determination of Conformity:

The Clean Air Act (CAA), 40 CFR Part 93.153 states that a conformity determination is required for each pollutant where the total of direct and indirect emissions in a non-attainment or maintenance area caused by a Federal action would exceed the *de minimis* Federal standards established in 40 CFR 93.153.

A conformity determination regarding the Corps' Federal action of constructing the Santa Paula Creek Flood Control Project would only be mandated if the direct and indirect emissions from construction and or maintenance exceeds twenty five tons per year, for either NOx or ROC (See 40 CFR 93.153). As per the calculations and Tables # G-1 through G-6, Appendix G, the CO, ROC, NOx, SOx and fugitive dusts emissions fall well below these *de minimus* levels as prescribed in 40 CFR 93.153(b). Therefore, this proposed project conforms to the Federal Clean Air Act as amended in 1990 and, as required, a Record of Non-Applicability has been prepared instead of a conformity determination (Appendix G).

**Summary of Air Quality Analysis**
**Total Project Emissions**
**Table 8.4.6-1**

| Source | PM-10 | CO | ROC | NOx | SOx | Pb |
|---|---|---|---|---|---|---|
| **Exhaust** | 9 | 25.99 | 4.33 | 45.47 | 3.88 | ------- |
| **Fugitives** | 101.45 | | | | | |
| **Daily Totals (lbs./day)** | 104 | 25.99 | 4.33 | 45.47 | 3.88 | |
| **Daily Thresholds (lbs./day)** | 150 | 550 | 75 | 100 | 150 | |
| **Number of constructio n days per two years** | 378 | 378 | 378 | 378 | 378 | |
| **Total Project (lbs./yr.)** | 19,814.76 | 4,912.1 1 | 818.37 | 8,593.83 | 733.32 | |
| **Total Project (tons/yr.)** | 9.90 | 2.46 | 0.41 | 4.30 | 0.37 | |
| **Annual Threshold (tons/yr.)** | 25 | 25 | 25 | 25 | 25 | |
| **Significance** | No | No | No | No | No | |

## 8.5 MITIGATION MEASURES:

- The selected contractor shall water the excavation site, storage piles and unpaved roads twice each day of construction; once in the morning and at the end of the construction day; this mitigation is applicable for both construction and future maintenance.
- Transported material shall be covered to reduce fugitive dust.
- Limit vehicle speeds to 15 mph maximum within the construction site and maintenance areas (construction and future maintenance), and cease grading and earth movement when wind speeds exceed 15 mph, or as confirmed by SBCAPCD during construction and future maintenance activities.
- The selected contractor shall cover the storage piles to minimize fugitive dust.

## 8.6 RESIDUAL IMPACTS:

Residual air quality impacts would be less than significant and would be further reduced with the inclusion of the mitigation measures recommended above.

# SECTION - 9 - NOISE

## 9.1 EXISTING NOISE:

Noise can be defined as unwanted sound or sound in the wrong place at the wrong time. Noise also can be defined as any sound that is undesirable because it interferes with speech and hearing, is intense enough to damage hearing, or is otherwise annoying. The definition of noise as unwanted sound implies that it has an adverse effect on human beings and their environment. Noise also disturbs natural wildlife and ecological systems (Environmental Impact Assessment, USACOE, Training Class, Larry W. Canter, 1989). The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound is mechanical energy from a vibrating surface, transmitted by cycling a series of compressions and reaction of molecules in the materials through which it passes. Sound can be passed through gases, liquids and solids. The human ear does not respond linearly to increases in sound pressure. The nonlinear response is essentially logarithmic. Therefore, noise measurements are expressed by the term "sound pressure level (SPL), which is the logarithmic ratio of the sound pressure to a reference pressure and is expressed as a dimensionless unit of power, the decibel (dB). The dB scale is used to quantify sound intensity. To obtain a single number representing a sound level containing a wide range of frequencies and yet representative of the human response, it is necessary to weight the low and high frequencies with respect to medium frequencies. The resultant SPL is "A weighted," and the units are dBA. The A-weighted sound level is also called the noise level. Noise may be generated from a point source, such as a piece of construction equipment, or from a line source, such as a road containing moving vehicles. Typically, noise decreases with distance. The source of noise can vary from an occasional aircraft overflight to continuous noise from traffic on an adjacent street. The SPL dBA for various types of activities measured in the environment and subjective human response to various intensities of noise, are represented in Table 9.1-1.

There are no federal, state or local noise standards that directly regulate environmental noise from construction or project operation. Federal regulations safeguard the hearing of workers exposed to occupational noise, enforced by the Office of Safety and Health Administration (OSHA). The U.S. Environmental Protection Agency (USEPA) has developed guidelines on the recommended maximum noise levels to protect public health and welfare (USEPA, 1974). For example, 55 dBA is the maximum for the annual average day-night level in outdoor areas (USEPA, 1978).

**TABLE 9.1-1**

**SPL, Sound Pressure, and Recognized Source of Noise in Our Daily Experiences**

| Sound Pressure, μbar | SPL, dBA | Example |
|---|---|---|
| 0.0002 | 0 | Threshold of hearing |
| 0.00063 | 10 | NA |
| 0.0002 | 20 | Studio for sound pictures |
| 0.0063 | 30 | Studio for speech broadcasting |
| 0.02 | 40 | Very quiet room |
| 0.063 | 50 | Residence |
| 0.2 | 60 | Conventional Speech |
| 0.63 | 70 | Street Traffic at 100 ft |
| 1 | 74 | Passing automobile at 20 ft |
| 2 | 80 | Light trucks at 20 ft |
| 6.3 | 90 | Subway at 20 ft |
| 63 | 110 | Loud motorcycle at 20 ft |
| 200 | 120 | Peak level from rock and roll band |
| 2000 | 140 | Jet plane on the ground at 20 ft |

Source: Environmental Impact Assessment, Dr. Larry W. Canter, University of Oklahoma, USACOE, Training, 1989.

### 9.1.2 **Noise Levels Within the Project Area**:

The regional sources of noise in this part of Santa Barbara include truck and automobile traffic along U.S. Highway 101, Union Pacific Railroad and local surface streets. As described in the Land Use Section of this report, the proposed project area is located in the vicinity of the downtown and waterfront and major land uses consist of residential, commercial and industrial uses. Current sources of noise in the project area include automobile and truck traffic along local streets and U.S. Highway 101, and railroad traffic. The City of Santa Barbara monitors noise levels within the city. Ambient noise levels within the Study Area have been identified based on the noise contour map prepared by Illingworth & Rodkin, Inc (1997), for the City of Santa Barbara. Ambient noise levels within the project area range from 60 to 70 dBA. The flow of automobiles was observed on the local street during the site survey. The lowest noise level recorded along local streets is 60 dBA, which is high compared to the normal noise levels experienced within a more suburban residential area. Noise levels generally increase approaching the ocean, because traffic volumes and tourist activities are higher closer to the coast. In addition, the Union Pacific Railroad mainline and U.S. Highway 101 are close to the coast.

## 9.2 CITY OF SANTA BARBARA GENERAL PLAN GOALS AND POLICIES FOR NOISE:

The Noise Element focuses on the noise environment in the City. It points out the problem areas and sets goals for maintaining and enhancing good noise conditions and improving areas with noise problems. The goal of the Noise Element is "to ensure that the City of Santa Barbara is free from excessive noise and abusive sounds." Policy 6.0 of the Noise Element points out that "noise control activities should be coordinated with those of other responsible jurisdictions." The City, County and USACOE will incorporate mitigation measures to reduce noise generated during project construction and future maintenance to meet the requirements of the City Noise Ordinance.

## 9.3 NOISE IMPACTS:

Noise related impacts would be considered significant if the noise level is excessive and produces an abusive sound. Long term noise should not exceed 60 dBA in residential areas, and 75 dBA near hotel or commercial areas. The City has no short-term noise impact thresholds. However, construction is not allowed between 7:00 p.m. and 7:00 a.m.

### 9.3.1 No Action Alternative No. 1 (Without Project Conditions):

Santa Barbara County has performed routine maintenance of Lower Mission Creek periodically in the past. This sediment removal activity has also occurred in the past after major storm events. During past maintenance activities, noise levels increased due to the use of construction equipment and trucks transporting materials. These impacts were localized and short-term. Reduction of project related noise impacts will be coordinated with the appropriate local agencies.

### 9.3.2 Alternatives 12, 6 and 8:

Construction equipment would elevate noise within the project area. Heavy construction equipment produces noise levels ranging from 80 to 89 dBA, as measured at a distance of 50 feet (79 dBA at 100 feet). Project construction would take about two years, i.e.; it would be constructed in two reaches. Within any one block, the construction related noise impacts could last about two to three weeks. This impact would be short-term. Residential areas would experience elevated noise levels during construction and future maintenance. Existing average noise levels range from 60 dBA to 70 dBA. Automobiles passing along the local streets could generate noise levels from 70 to 74 dBA, and loud motorcycles could generate about 110 dBA at a distance of 20 feet (See Table 9.1-1 for noise levels generated by various activities). The noise levels would be elevated compared to existing noise levels due to the use of construction equipment in the vicinity of the project site. Increases in noise levels compared to existing noise level would be about 10 to 15 dBA. In addition, construction activities would not remain at one location. It is assumed that construction equipment would be at one location (within a 100-foot area) for about 2 to 5 days. Noise increases due to construction would be localized; impacts would be short-term, affecting only the immediate project vicinity and surface streets would be designated as haul routes. Conditions would be stabilized after completion of the project construction or future maintenance.

The USACOE staff will coordinate with the City of Santa Barbara for noise ordinance compliance. Use of heavy equipment and truck traffic would follow the City of Santa Barbara noise ordinance regulations. To minimize noise impacts during early morning and late evening, operation of heavy equipment (bulldozers, excavators crushers) would be limited to the hours between 8:00 a.m. and 5 p.m., Monday through Saturday. Truck transportation would be permitted between 7:00 a.m. and 7:00 p.m. No construction activity would occur on Sundays and holidays.

## 9.4 MITIGATION MEASURES:

- Operation of heavy equipment shall be limited to the hours between 8:00 a.m. and
- 5:00 p.m., Monday through Saturday. Truck transportation shall be permitted between 7:00 a.m. and 7:00 p.m., Monday through Saturday. No operation of heavy equipment or truck transportation shall occur on Sundays and holidays.
- Truck traffic shall be limited to designated truck routes, as determined in cooperation with City Transportation staff.
- The selected construction contractor shall follow the noise ordinance established by the City of Santa Barbara.
- Property owners and tenants within the project area shall be notified prior to project construction in their area.

## 9.5 RESIDUAL IMPACTS:

With the implementation of the above mitigation measures, the project would have short-term impacts within the construction zone, which are not considered to be significant. The conditions would be normal after completion of the project. There will be no long-term noise impacts as a result of the construction of the flood control project.

# SECTION - 10 - BIOLOGICAL RESOURCES

## 10.1 THE PHYSICAL SETTING OF BIOLOGICAL RESOURCES ALONG THE CREEK:

### 10.1.1 An Overview:

This compilation of existing biological and habitat conditions relies on assorted documents available to the public, published papers of academic origin available through university libraries, a Draft Coordination Act Report prepared by the US Fish and Wildlife Service (USFWS), a Biological Opinion about potential effects of the recommended Alternative on steelhead prepared by the National Marine Fisheries Service (NMFS), conversations with persons knowledgeable about particular topics or subjects along Mission Creek, and site visits by the Corps of Engineers in September and December of 1997, January 1999, and May 1999. However, it is not intended to present a complete and thorough encyclopedic list of the plants and animals which may be found if one looks hard enough. Instead, only the important and representative species are noted. Fiscal limitations constrain this report from spending funds for a repetition of biological surveys, especially when prospects would doubtfully yield significant new information about species and their ecological roles in the limited geographic area along lower Mission Creek, where this proposed flood control project would be implemented.

Previous planning efforts for flood control along the lower part of Mission Creek led to numerous ecological surveys of specific segments of Mission Creek within the urban region. Historically, these emphasized species of reptiles and amphibians, birds, mammals, and vascular plants. Fish, nearly all invertebrates except those few which elicited casual mention in written reports, non-vascular plants, and the animal-like and plant-like single celled organisms which populate fresh water habitats have never been examined systematically. A comprehensive summary of biota identified in the lower and upper reaches of Mission Creek includes 26 species of amphibians and reptiles combined, 108 bird species, 37 mammalian species, and 222 species of vascular plants (Corps of Engineers, 1995). For the most part, these types of organisms include only the limited suite of plant and wildlife species comfortable in close proximity to human modifications to the natural world.

This evaluation of existing biological circumstances encompasses the stream banks and the creek between the intersection of Canon Perdido and Castillo Streets and Cabrillo Boulevard. The ecological effects of future maintenance expectations have been restricted to this same boundary as well.

### 10.1.2 Transformation from Riparian to Existing Urban Biotic Conditions:

Mission Creek has unquestionably experienced much change to its biotic character in the last two hundred years, but in the absence of concise descriptions from the era prior to settlement by Europeans this characterization has to be drawn from ecological generalizations about streams

of the coastal plains and their environs in southern California. Overall, the lay of the land gives Mission Creek a roundabout course between its watershed in the Santa Ynez Mountains to the north and the Pacific Ocean: heading south at first, then turning through a broad arc from a westerly direction through south again and eventually following a southeasterly direction to its mouth at the coast. Most of its length, below the narrow place now called Rocky Nook, would likely have been characterized as riparian woodland (*sensu latu*; Bowler, 1989). Close to the ocean, the creek almost certainly spread out into a braided, estuarine wetland.

Mission Creek provided the steady water source which enabled Franciscans to found the historic Mission Santa Barbara (a protracted beginning between 1787 and 1820), then sustain the agrarian community following the European economic pattern which developed in the immediate region surrounding the Mission. Pastoral agriculture associated with the Mission surely prompted the first large influences on the biotic communities native to the lower end of Mission Creek, between 1820 and 1890. An increasingly urban emphasis after that has had a predictable outcome: the immediate and greatest effects come from commercial and residential development within the City of Santa Barbara, and the construction and maintenance of roads and bridges on which those very urban developments depend. What was once native riparian community and wetlands inevitably became rearranged to suit human purposes. Now, no portion of Mission Creek within the geographic area covered by this report lacks for man's influences on the stream's channel or its banks. These improvements closely line the actual stream course and often have completely removed any remnant of the riparian environment which existed there before the coming of the Spanish.

After reaching the coastal plain, Lower Mission Creek undergoes a gradual transformation, from a narrow and incised fresh water stream to a narrow estuary. Most of its length below Castillo Street, slightly more than a mile, is riverine in character. A switch from fresh to brackish water typically begins at Yanonali Street and estuarine properties are well developed by the Mason Street Bridge. Daily tides, or at least a regular infiltration of salt water through a barrier which forms naturally at the creek's mouth during the summer months, give that final length a more pronounced estuarine character closer to the beach. After passing beneath Cabrillo Boulevard, Mission Creek essentially ends in a seasonal lagoon at the edge of Santa Barbara Harbor. This study does not extend to that lagoon, although incidental remarks about it will help round out the ecological characterization of the project, its potential impacts, and ameliorations of them.

Natural habitat in both the riverine and the estuarine sections of Mission Creek is strongly limited by all aspects of urban development: periodic clearance of vegetation and accumulated sediments from the channel, the indiscriminate use of the channel as a dumping ground for refuse, intermittent and private hard siding of its banks, housing on private property along both sides of the channel, bridges carrying roads over the channel, the convenience of discharging storm water lines into the channel (especially underneath bridges), and the concentration of business developments within or adjacent to residential neighborhoods.

Two species of fish, both Federally protected as endangered under the Endangered Species Act, make use of Mission Creek. The tidewater goby (*Eucyclogobius newberryi*) could be present from late spring through the fall months in the estuarine part of the creek. Gobies enter the creek from the coastal lagoon and forage as far upstream as the Yanonali Street Bridge. At that point, a man-made sill about 15 inches high spans the entire channel. Especially during the summer months when the creek often carries very little water, its minimal depth combined with other factors would appear to make it very difficult for gobies to cross above this sill and swim even as far upstream as lower end of the sandstone channel. The second species, steelhead (*Oncorhynchus mykiss*), uses the lower end of Mission Creek as a migratory channel in some years. When flow conditions permit, adults swim upstream to spawning sites in the upper reaches. Juvenile steelhead, called smolts in this stage of their life history, use Mission Creek through the project area only as a migratory corridor to the ocean. Lower Mission Creek does not afford spawning or rearing conditions for steelhead.

Isolated native trees of notable age and stature still occur at various locations along the creek. Very prominent western sycamores (*Platanus racemosa*) are well established and healthy at six widely separate places. A medium sized coast live oak (*Quercus agrifolia*) has grown on a low bank just above the streambed near one of the bridges. Elsewhere along the creek, a young cottonwood (*Populus fremontii*) struggles to survive against the effects of periodic channel maintenance, and a few mature willows (*Salix lasiolepis* and *S. laevigata*) and fewer still white alders (*Alnus rhombifolia*) have become established on the overbank.

The Moreton Bay Fig (*Ficus macrophylla*) for which Santa Barbara is renowned, grows east of Mission Creek and at an elevation about 7 feet higher than the channel.

R Hydrologically, Mission Creek should now be considered a seasonal watercourse in dry years. It was likely permanent before 1800, but removal of native vegetation throughout its watershed would have had potentially large effects. Man-made diversions considerably farther upstream also diminish its flow through this section. May through October are the driest months along this part of the coast, when total rainfall amounts to about 1.3 inches, on average. During the months from late summer through fall, little to no water drains from this watershed. The incidental trickle moving down the channel after mid-summer appears to arise primarily as urban runoff, entering Mission Creek via storm drains along its course. After the onset of winter rains it conveys runoff as surface flow to Santa Barbara Harbor.

### 10.1.3 Existing Urban Conditions along Lower Mission Creek:

A riverine biological community on the coastal plain of southern California without the dominating urban constraints which characterize Mission Creek would have two predominant features, the stream bed and the variable depths of water flowing along it, and the vegetation growing in structural layers along its banks. Both would influence each other, although stream bank features would ordinarily have a much stronger determining influence on such attributes as water temperature, the plants and animals in the stream, light conditions, nutrient availability to animals, and so forth than the stream would exert on the banks.

R Practically speaking however, urban influences in this lowest region of Mission Creek have disrupted those functional ecological processes and nearly all the actual physical links between stream banks and streambed, such as canopy trees growing from the edge of the streambed or just up on the bank and forming submerged root masses. Even so, Mission Creek continues to sustain impoverished habitat for plants and wildlife as discussed below. The urban reality of biological conditions here make a simplistic distinction between the stream's banks and the aquatic elements confined to the streambed of the creek an easier way to describe both the impacts and the ecological returns of design features of the proposed flood control project.

R 10.1.4 **Numerical Values Express Ecological Quality**:

Comparisons of long-term effects on biological resources become the chief way by which alternatives have been evaluated. This is termed a Habitat Evaluation Procedure (HEP). Reaching conclusions by a HEP will entail numerical descriptions of stream bank and aquatic habitats, in addition to their respective verbal characterizations. In essence, any changes in those numerical values indicate the nature of effects which may be ascribed to alternatives. Comparisons will primarily be drawn between Alternative 12, the proposed and recommended flood control design, and Alternative 1, the formal decision to implement No Action. Alternative 1 can be viewed as the expectation of future conditions in the absence of the proposed project.

Habitat worth for both alternatives will be expressed as Habitat Units, abbreviated HU. Higher values of HU correspond to an assessment of higher ecological value. The straightforward arithmetic of HEP leads to HU values, but requires a cumbersomely involved sequence of steps. Those steps are best presented elsewhere (Appendix C). HEP calculations are merely summarized by simple numbers throughout Chapter 10.

## 10.2 EXISTING BIOLOGICAL RESOURCES:

### 10.2.1 Aquatic Habitat:

R **Streambed of Lower Mission Creek**: As best Lower Mission Creek may be characterized, its aquatic habitat equates to ecological conditions prevailing below the ordinary high water mark. It retains its fresh water characteristics from the upper end of the project area (where Mission Creek emerges from beneath the bridge at Castillo and Canon Perdido Streets) down to Yanonali Street. Mission Creek is just barely a perennial stream however. Indeed, urban runoff alone may prevent the disappearance of surface water after late summer. Estuarine traits prevail from there down to the lower end of the project area (where the creek passes beneath the bridge at Cabrillo Boulevard), becoming saltier with the interchange of fresh and salt water closer to the harbor. Commercial and residential development which took place historically along this last section of creek now constrain it within a nearly artificial channel: no mudflats dissected by tidal creeks remain anywhere along the estuary. No tracheophyte plant species ecologically associated with functional coastal marine communities remain anywhere along Mission Creek.

This full span of the existing aquatic habitat within the project area measures about 5300 feet in length (measured along the center of the channel). Not all that full length of creek bottom would actually be reshaped as part of the recommended alternative, however. Approximately 18% of the stream's present water course would be left entirely unchanged. This portion of its aquatic habitat to be excluded from any disturbance spans the distance from the upstream side of Highway 101 to the downstream side of Yanonali Street, about 975 feet in length. Considering then the actual proportions of aquatic habitat which lie within the proposed construction footprint, upstream of the freeway (about 3150 feet long, roughly 59% of the existing streambed) Mission Creek carries fresh water, then a varying mix of fresh and salt water (shifting always with tidal influxes) downstream of Yanonali Street (a reach about 1170 feet long and 22% of the existing stream bed).

A sequence of man-made structures forms a substantial portion of the existing watercourse. This section probably follows the naturally incised channel although that is not now evident. Mission Creek first bends to the right just above Highway 101, creating a feature known locally as the oxbow. In very quick succession thereafter, the oxbow leads water beneath the freeway (a box culvert bridge 140 feet wide), through a 60 foot length lined by riprap and wing walls, beneath Montecito Street (also a box culvert bridge, 60 feet wide), through a 20 foot section lined again by wing walls, beneath the bridge which elevates the railroad tracks (a central pillar bridge 70 feet wide), and then bends back to the left at the upper end of the historic sandstone-lined channel. The sandstone channel has a concrete bottom and carries water as far (about 530 feet in length) as the bridge at Yanonali Street. The transition from fresh to brackish water effectively begins directly beneath the Yanonali bridge where a sill roughly 15 inches high spans the full width of the creek bed (entirely concrete at that point) and marks the upper limit of tidal influence, except perhaps during very severe winter storms.

Apart from the reach of bridges and sandstone channel just described, in both the fresh-water and the estuarine segments its aquatic properties have been influenced to a very great degree by individual property owner's decisions to armor streambanks on their property, the toe of those banks, and even the creek bed itself in many locations against erosion. Where concrete was placed below the ordinary high water mark, the result can be a solid projection into the low flow path of the creek in some places, a uniformly broad, flat surface (e.g. upstream of the Gutierrez Street Bridge), or concrete edges that confine the creek's low flow route to a narrow course. Estimates of the length of the streambed where only natural surfaces are evident — admitting the probable existence of some concrete now covered thoroughly by native sediments — were made by walking the creek. Natural sediments (silty muds and gravels) compose the streambed for about ⅔ of its length (roughly 3560 feet, not including that found between Highway 101 and Yanonali Street) within the project area (3560/5380 = 0.66), while evident hardened surfaces cover roughly ⅓ the length of the stream bed (1820/5380 = 0.33).

R **Periodic maintenance perpetuates existing conditions**: The County Flood Control presently cleans the fresh water portions of the creek as needed to remove accumulated sediments,

obstructive growth of plants, and accumulated debris. Sporadic accumulation which diminishes its conveyance capacity by more than 15% triggers that need for maintenance. That maintenance procedure has stripped the creek bed of most natural features that would have contributed to a heterogeneous stream channel.

When first examined on September 11, 1997, the bottom of the channel had very recently been cleaned of most vegetation and accumulated debris by the Santa Barbara County Flood Control and Water Conservation District. Indeed, it was bare and all but devoid of any features through most of its length from Canon Perdido Street to the south side of the Montecito Street Bridge. Reports of first-hand observations by several members of the Corps who saw the same places in late August contrasted starkly with the scoured conditions found in mid-September. Moreover, the differences evident between August and September of 1997 are indicative of the long-term existing conditions, a channel maintained as needed to keep water moving through the creek rather than encourage growth of native vegetation. Over a sequence of years, one would see a discernible pattern of cyclical changes, from bare creek bottom to the first stages of seral succession in a coastal stream, then back again to bare creek bottom. The streambed reflects this historic emphasis on periodic maintenance.

The preparations in late summer of 1997 for heavy rains possibly to come with El Niño emphasize the balance between the extent of channel maintenance required periodically to restore its conveyance capacity, which can have pronounced but temporary biological effects, and the inherent successional pattern of plants reestablishing themselves. Were it not for occasional cleaning of the streambed, herbaceous plants would take root and proliferate, then create the ecological circumstances which promote shrubby perennials followed by regrowth of trees adapted to this biological community.

Channel maintenance began at the intersection of Canon Perdido and Castillo Streets, the transition between the trapezoidal concrete channel built by CalTrans and the native soils which compose the channel bottom downstream from that point. Channel maintenance extended as far as the concrete underpass through which the creek flows beneath US 101.

The effects of channel cleaning were somewhat patchy. The maintenance had evidently removed from the bottom itself and the lowest edges of the banks substantial quantities of giant reed (*Arundo donax*), umbrella sedge (*Cyperus erogrostis*), castor bean (*Ricinis communis*), tree tobacco (*Nicotiana glauca*), and undoubtedly various other weedy species. Plants higher up, even a few inches above the flat channel bottom, were not damaged. In some areas, essentially the entire width of the bottom had been scraped bare of plants, yet elsewhere even delicate aquatic vegetation a few inches tall was virtually undisturbed. Where the scoop or blade had occasionally passed above them at various places along the channel, these small clusters of undamaged plants included yellow water evening primrose (*Ludwigia peploides*), cattails (*Typha* sp.), bulrushes (*Scirpus* sp.), and water smartweed (*Polygonum persicaria).*

Sixteen months later, January 1999, the streambed was less austere, probably due to rains in the 1998 El Niño season. Those notable rains had brought sediments from upstream and

currents had defined a definite channel along the streambed. Herbaceous vegetation had begun to grow in small islands.

By May 1999, considerable growth of herbaceous and also perennial stream-bottom plants was evident. Many plant species had become established after the last channel maintenance. The great majority of species were still herbaceous (the most common of them not already mentioned above including northern willowherb [*Epilobium adenocaulon*], water cress [*Rorippa nasturtium-aquaticum*], yellow sweet-clover [*Meliotus indicus*], black mustard [*Brassica nigra*], a coarse rye grass [*Lolium* sp.], rabbit's foot grass [*Polypogon monospeliensis*], sweet fennel [*Foeniculum vulgare*], smilo grass [*Piptatherum miliaceum*], and willow dock [*Rumex salicifolia*], but a few perennials had started as well (a blackberry [*Rubus ursinus*], white nightshade [*Solanum douglasii*], mulefat [*Baccharis salicifolia*], poison hemlock [*Conium maculatum*], sand-bar willow [*Salix exigua]* in a couple of places, and salt cedars [*Tamarix* sp.] growing in the sandstone channel). At several locations along the creek, seedling red willows (*Salix laevigata*) and western sycamores (*Platanus racemosa*) already had a good start.

In addition to growth of plants, by May 1999 the streambed had reacquired topographic variation, albeit on a modest scale. Rocky stretches and winding creek prevailed in some parts. Elsewhere the bottom was quite soft, oozy mud.

**Riverine pools**: Walking the creek bottom twice in May 1999, revealed notable changes to the streambed attributable to stream flow over the previous two rainy seasons. Where, in September 1997, it had been artificially smoothed and leveled, by late Spring of 1999 Mission Creek had carried enough water to scour deep pools in its bed. These formed most commonly where currents had undercut the concrete sills that form the toe of private bank stabilization techniques in several places, next most often at bridge abutments, and lastly in exposed rocky runs just above the freeway (Fig.10-1).

All extant pools, except the pair in the upper part of the oxbow, have formed where complex hydrological interactions between man-made structures and currents caused differential erosion and sediment deposition patterns. The rains of El Niño may have exacerbated these scouring patterns. A sizable hole in the streambed currently present at the upstream end of the Bath Street bridge exemplifies this relationship. At this spot, a wing wall protecting the right hand bank, together with the concrete bottom of the bridge and the vertical wall of the bridge itself, induced the formation of a hole estimated to be 5 feet deep, 15 feet wide, and 40 feet long. Moreover, a raised lip of soft sediments has formed immediately upstream of the hole. In

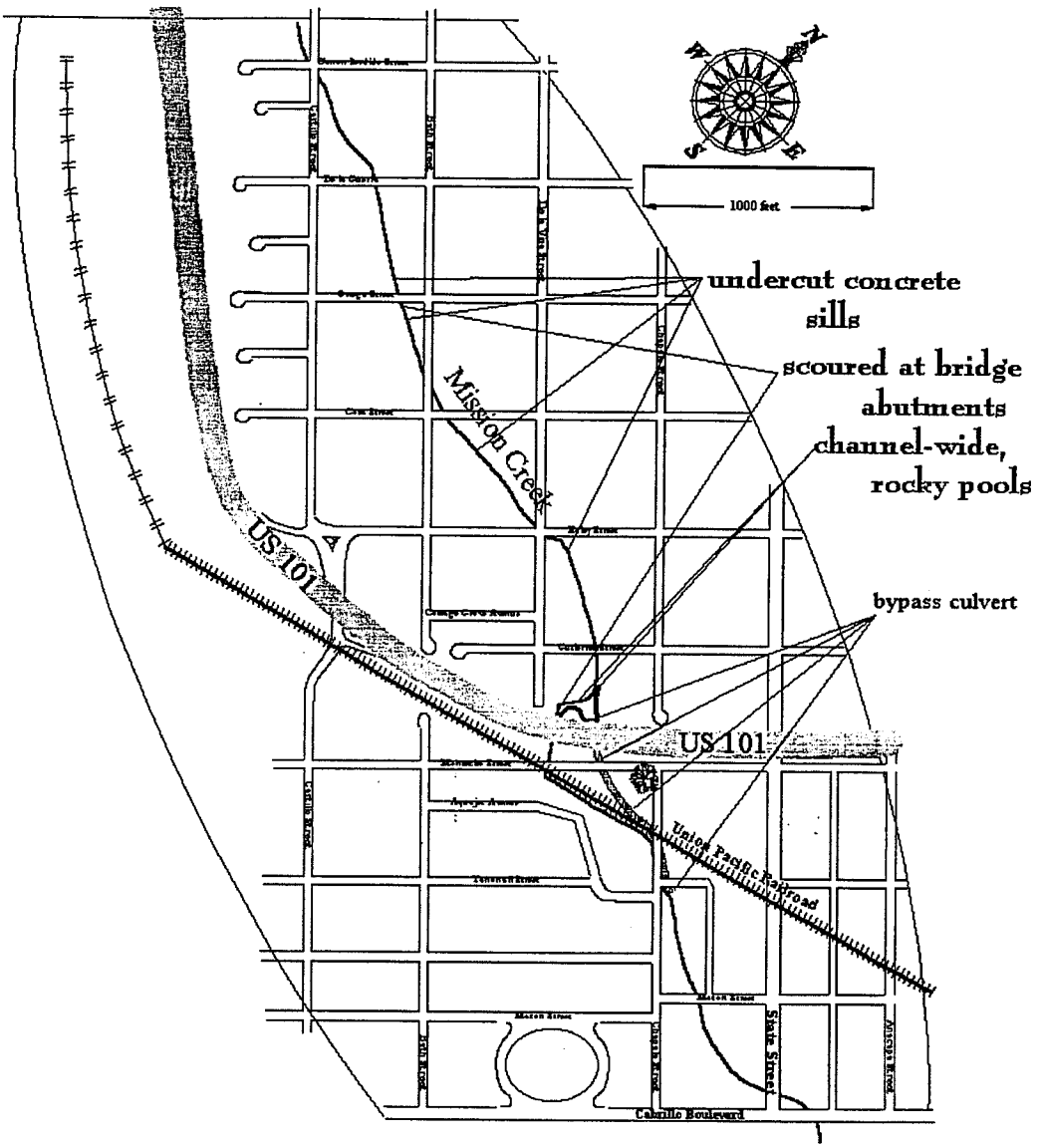



Fig. 10-1. Location of riverine pools extant in May, 1999. Those at bridge abutments were the largest and deepest.

essence, the upstream edge of the bridge caused the formation of this deep pool. In all likelihood, currents varying with the conditions of any given rainy season could equally well cause such pools to fill with sediments and disappear, given a steady season of low velocities down Mission Creek. In addition to being transient for that very reason, and they would also tend to change in size from one season to the next.

R The largest of these pools formed at the upstream abutments of bridges. Two such pools existed in May 1999, one at Bath Street and the other at the US101. Concrete ledges poured by private owners have also created pools where currents undercut them. The longest seen in May 1999 was estimated as 25 feet in length and possibly 4 feet deep. The smallest such ledge pool

was about 7 feet in length and perhaps a foot deep. Four undercut concrete sills of this nature were identified in May 1999. Two natural pools have formed amid rocks and concrete rubble in the oxbow, a short distance upstream of the freeway. Each was approximately 10 feet long, 1½ feet deep and as wide as the channel. If these pools persist through the summer and fall, they would constitute noteworthy refuges for aquatic life in the oxbow area of the existing watercourse.

While these isolated pools were evident in May 1999, on the whole, Mission Creek lacks any substantive areas of runs, riffles, pools, turbulent waters and eddies.

R **Instream macro-invertebrate fauna**: An experimental comparison of three different places in Mission Creek by students at UC Santa Barbara hints at greater diversity of species where natural sediments make up the stream bottom, compared to locations where the bottom has been hardened (McGoogan and Rose, 1999). Data presented contain counts of species recorded by a standard stream sampling technique, but not counts of individuals within those species. The animals caught actually include a number of terrestrial arthropods, as well as aquatic arthropods, segmented worms, molluscs, algae, and amphibians. Hence, they give a glimpse of the diversity of invertebrates which inhabit parts of the streams, from its bottom to lower portions of the banks. The sampling location with a strictly natural bottom, from boulders 1-2 meters in diameter to gravels and sands in quieter stretches, had the greatest number of species. That with solid concrete bottom had the fewest. No statistical analyses of these data were reported, so differences cannot be claimed as significant. Additionally, the site with natural bottom sediments happens to be at the highest elevation (above the Botanical Gardens) while the other two are below Oak Park. An unexpected influence of more urban setting at lower elevations could have a causal effect on this difference.

R **Water temperatures**: The City of Santa Barbara gathered diurnal temperature records at nine locations in the riverine portion of the project area, between Valerio Street (upstream of the project area) and the oxbow in June 2000. The locations, techniques, and original data may be found on file at the USACOE Los Angeles District offices and at the City of Santa Barbara. Two distinct patterns appear in these data. First, water temperatures at any given sampling station tend to be higher as the day advances. Secondly, at any hour of the day higher water temperatures were recorded the farther downstream from the CalTrans Channel. Water temperatures ranged between 63° F at 7:30 AM below Canon Perdido Street to about 75½° F at 1:30 PM between Bath and Cota Streets. The data also indicate that shading of the stream bed, sample site between de la Guerra and Ortega Streets, moderates water temperatures in June only to a limited degree:

"Partial and full shading of the channel bed by large over hanging trees reduces peak water temperatures by about 5 degrees F in the early summer. This is considered only a modest reduction in temperature, perhaps because other factors have an equal or greater influence, such as the latent heat contained in the water as it travels downstream." (URS Corporation, 2000 -

Sunlight warming water as it passes through the CalTrans Channel may have an overriding effect on water temperatures within the upper portion of the project area during the summer and fall months (URS Corporation, 2000). Similar solar heating may take place within the sandstone channel, since sunlight is not blocked by anything during midday.

**Estuary conditions**: The riverine traits of Mission Creek begin to change roughly at the Yanonali Street bridge. It is creek-like above that point, progressively more estuarine below as saline water moving upstream from the ocean mixes with fresh water coming down Mission Creek to create a narrow estuary above Cabrillo Boulevard. In fact, just at the Yanonali Street bridge, a man-made sill about 15 inches high and spanning the entire channel would block any significant daily tidal flush farther upstream than Yanonali Street. Except during exceptionally high tides and driven by storms at that, brackish water probably never reaches much above the lower end of the sandstone-wall channel.

R Its length varies seasonally. In September 1997, for example, estuarine properties became evident between Yanonali and Mason Streets, but a photograph made in February 1998 shows brackish water barely as far upstream as State Street. During the rainy season, runoff could push salt water as far down the channel as the lagoon below Cabrillo Boulevard.

Measurements of relevant water chemistry properties reveal this seasonal influence. The City of Santa Barbara engaged a private contractor to sample water in Mission Creek at two locations on a weekly schedule beginning in late November 1994 and continuing through October 1995. Locations about 65 yards apart were chosen near the lower end of the estuary. Samples from the lower site came from the upstream side of the Cabrillo Boulevard bridge, and those from farther up the estuary came from the upstream side of the State Street bridge (City of Santa Barbara, 1995). No details of sampling techniques are available. The graphs which follow, Figs. 10.2, 10.3, and 10.4 , summarize the seasonal patterns of salinity, turbidity, and water temperature.

Water in the open ocean off Santa Barbara would have a total salinity approximately 35 grams per liter (g/l). Water in this lower part of the estuary is somewhat diluted in the summer months, approximately 20 g/l, and may be virtually free of salt during times in the wet season (Fig. 10-2). Peak salinities (approximately 30 g/l) occurred between mid-June and early January

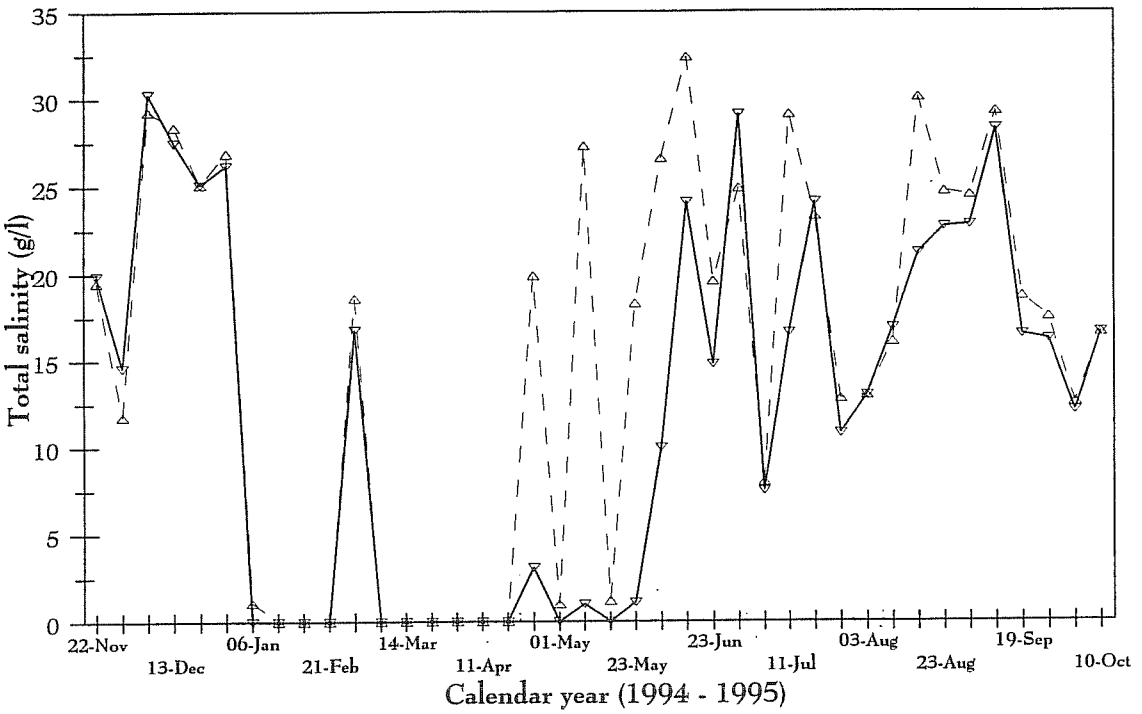



Fig 10-2. Salinity (measured in grams per liter, g/l) at two sampling locations in the Mission Creek estuary. Measurements shown by the dashed line came from the upstream side of the Cabrillo Boulevard Bridge; those shown as a solid line were taken on the upstream side of State Street Bridge. Despite a few dates when salinity differs between the two sample locations, the differences between them overall are not significant, $p(F_{1,76} = 1.501) = 0.22$.

that year, when the minimal amount of water flows from the Mission Creek watershed. During the winter months, steady runoff sweeps saline water out of the lagoon and salinities were below the sensitivity, less than 1g/l, of the measuring instrument (a refractometer). Note an anomalously high spike of saline water (18 g/l) about the 1st of March 1995. It does not correspond with a curiously high temperature (Fig.10-4), as might be expected during a run of dry weather.

Overall, the estuarine water just before Mission Creek opens into the lagoon contains rather little suspended sediment, as measured by total turbidity of the water column (Fig. 10-5). With the exception of two sharp increases of turbidity caused by heavy run off, the first in mid-January and the second in mid-May of 1995, turbidity ranges from levels less than 1 NTU to

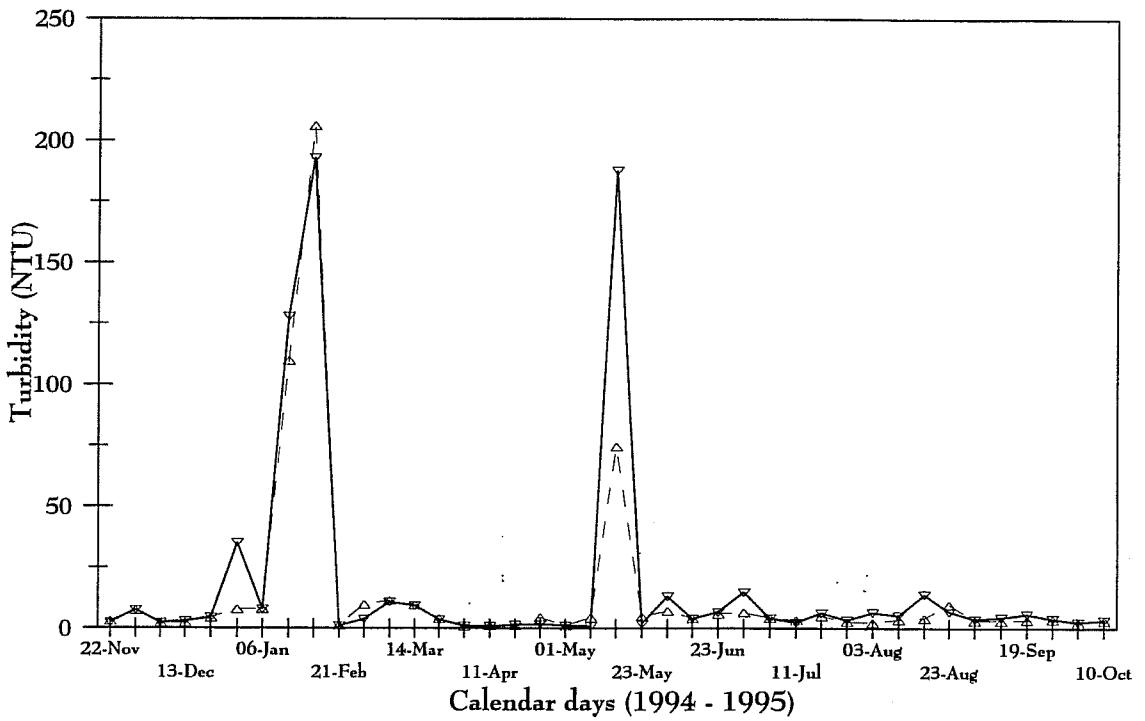



Fig. 10-3. Total turbidity (measured in nephelometric turbidity units, NTUs) at two sites in the Mission Creek estuary. Lines and symbols follow the convention of Fig. 10-2.

about 10 NTU. While not a measurement which most people commonly encounter, nephelometric turbidity units (NTUs) provide a quantitative measure of light scattering by all the solids suspended in a water sample: e.g., a glass of water measured as about 15 NTU looks faintly cloudy to the eye.

Sediments contributing to turbidity of Mission Creek would seem to originate from rather different sources in a manner also linked to climatic seasonality. The meager and non-continuous flow down Mission Creek seen in September 1997 would be incapable of transporting sediments a significant distance along the channel. Urban runoff from streets that enter via storm drains under bridges, particularly at Mason Street, could add somewhat to turbidity farther downstream, but most of the opacity of water in the estuary is probably due to roiling of the water caused by daily tidal fluctuations. The rise in stream volume and velocity coinciding with the onset of winter rains would carry sediments through the estuary and out into

the lagoon, and could reasonably account for the fluctuations seen between December and May of 1995 in Figure 10-3.

Water temperature also follows a noticeable seasonal pattern (Fig. 10-4). By mid-January, the water temperatures are likely to be between 15° C and 17° C, then rise gradually to about 23° C by mid- August. Temperatures start to cool through the fall. Times when net movement of water through the lower end of Mission Creek nearly ceases and water temperature rises quickly, as in late December and early January of 1995, are probably transient events.

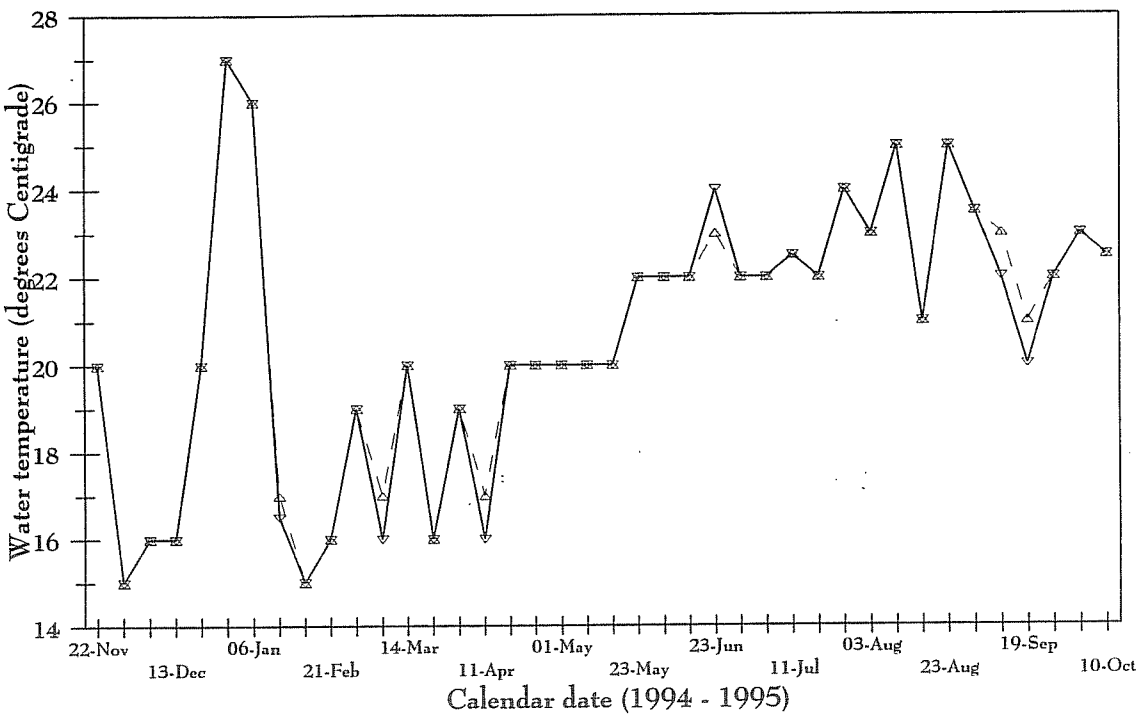



Fig. 10-4. Water temperatures (degrees Celsius) measured at two sampling locations in the Mission Creek estuary. Lines and symbols follow the convention of Fig. 10-2.

Organisms with comparatively narrow tolerances for temperature fluctuations could be adversely affected by such unseasonable rises.

R The relationship between water temperature and depth of water in the estuary was investigated on June 10th and 13th, 2000 (URS Corporation, 2000). Measurements were made at depth intervals of 6 inches, in the morning and afternoon (times of day not stated more exactly) at the State Street and the Mason Street bridges. The pattern is the same at both locations in June. Temperatures in the shallowest water, 6 inches, were found to be very close to 70° F, whether in the morning or the afternoon. Maximum water depths at both locations (60 inches at Mason Street and 66 inches at State Street) were at 87° F, whether in the morning or the afternoon. The pattern of temperature rise is not a linear relationship with depth of water. Descriptions of

measurement locations, techniques, original data and analyses of them may be found on file at the USACOE Los Angeles District offices and at the City of Santa Barbara.

R Salinity did vary more nearly in a linear manner as water depth increased (URS Corporation, 2000). Lowest salinities were measured when the estuary had emptied of tidal water and most of what was present had come down from Mission Creek, e.g. concentrations about 1 part per thousand at a water depth of 12 inches or less at both bridges, and irrespective of whether measured in the morning or the afternoon. Water depths of 60 to 66 inches at both bridges corresponded to salinities of about 15½ parts per thousand, again whether measured in the morning or the afternoon.

R These data indicate that aquatic conditions in the estuary in June are most influenced by tidal movement of water, and less so by the attributes of water coming down Mission Creek. In comparison, temperature and salinity data measured in 1994 and 1995 (Figs. 10-2 and 10-4) can reasonably be interpreted to mean that storm runoff during winter months may swamp the effects of tidal flush in establishing general water conditions in the estuary.

R **Quality of aquatic habitat**: The HEP computations (Appendix C) yield a total value of 0.73 habitat units for aquatic habitat along this region of Mission Creek.

10.2.2 **Stream Bank Habitat**:

**Stream bank surfaces**: Between Canon Perdido Street and Cabrillo Boulevard, Mission Creek passes through a highly urbanized section of the City of Santa Barbara. No gallery of tree tops exists within the project boundary, although stately western sycamores and a few other native trees, much smaller and less conspicuous than the sycamores, still thrive in isolation from each other at various locations along the creek. Similarly, no layer of shrubby native plants, such as would be found beneath a tree canopy in natural settings, grows along these sections of Mission Creek. Miscellaneous urban refuse scattered on the stream's banks is a very common sight throughout the project area. In the main, the creek retains little undisturbed quality.

Residential properties line both banks and houses often overlook the creek directly. Commercial businesses have been established at the edge of the Creek in several locations as well. In numerous locations, private property owners have built structural walls that constitute parts of houses, garages, etcetera and which actually form the bank itself. The building is the stream bank. Additionally, private citizens have invested considerable labor and personal expense to create localized bank stabilization structures. The length of Mission Creek sports a remarkable variety of these revetments. Stacked burlap bags filled with concrete, large rocks with soil packed between them, large rocks mortared together, sprayed concrete surfaces, grouted stone, jointed masonry walls, shot-crete walls, wire baskets filled with coarse rock, formed walls, wooden bulkhead walls and pilings, and all manner of combinations of these elements arranged either vertically or sloped to cover the existing bank shape may be found throughout the length of the project. Many lack a solid surface and their efficacy is often doubtful. In lieu of undisturbed natural surfaces along the banks where a bona fide riparian plant community could take shape,

opportunistic vegetation grows in such chinks of these various revetments as happen to provide openings for vegetation to become established.

R The proposed alternative would affect about ¾ of the existing banks within the project's overall area. The other quarter of banks along the lower portion of Mission Creek occurs between Highway 101 and the downstream side of Yanonali Street. By design of Alternative 12, it would not alter in any way the streambed or banks through this reach, which amounts to most of the oxbow and the entire length of the sandstone channel. As it happens, every foot of these banks, about 2060 linear feet counting both sides and all the bridges in between, are entirely bare of plant growth anyway. The length of banks between the upstream side of the freeway and the downstream side of the bridge at Yanonali Street has been disregarded altogether from environmental analyses since it would not be a part of the flood control project anyway.

R The proposed flood control design would reshape all existing banks prior to planting native trees and shrubs along much of the lower creek. Currently though, the presence of hardened bank surfaces exerts a strong effect on the abundance and vigor of plants there. All totaled, 7310 linear feet of stream bank exists within the project area, measured on both sides of the creek and excluding from that total the widths of bridges and their flanking walls and disregarding the segment from the freeway through the sandstone channel. Of the existing stream banks which are not structural components of bridges, 2100 linear feet (29%, counting both sides of the creek) have natural soft surfaces, while 5210 linear feet (71%,) have have been armored by some means or other. In essence, revetments cover about ¾ of these banks.

R These revetments, of quite diverse materials and variable workmanship, are not uniformly solid and impenetrable by plant roots. Where some lengths of protected banks preclude growth of anything, e.g. the right hand bank upstream of the Gutierrez Street bridge, elsewhere within the project area plants do get by and currently inhabit about 4350 linear feet of stream bank. However, plants native to a stream side habitat in southern California are few and far between. Save for venerable and large western sycamores ("skyline trees", in reference to their size and visual prominence) at six locations along the creek, it retains almost none of the stratification of canopy and understory species it must have had a century and more ago. Widely scattered arroyo willows (*Salix lasiolepis*) and white alders (*Alnus rhombifolia*) growing equally sparsely hint of what was once there as additional components of the riparian community.

**Predominant vegetation**: The banks of Lower Mission Creek sustain a coarse growth of opportunistic perennials in many locations. Invasive non-native species compose virtually the entire plant assemblage along the creek. Giant reed (*Arundo donax*) forms the most conspicuous element of stream bank vegetation, and probably would rank highest in biomass of anything growing along the creek In the main, this vegetation consists largely of giant reed, castor bean (*Ricinis communis*), tree tobacco (*Nicotiana glauca*), and similar invasive aliens. They have taken root in any location where roots can penetrate the hardened bank stabilization surfaces that

exist in remarkable diversity along the creek. In places where vertical walls already exist, giant reed can be found growing in dense stands at the top of bank protection features. Salt cedars (*Tamarix* sp.), alien and highly invasive weedy trees, are established in the sandstone channel. Another alien species, pampas grass (*Cortaderia jubata*) lines most of the existing left-hand bank (looking downstream) between Mason and State Streets.

The weedy growths lack the structural arrangement of the understory layer of plants which would prevail here if natural seral successional process had not been interrupted by urban development. Remnants of willows can be found in a couple locations at the foot of the bank where machinery did not completely remove them during recent maintenance of the lowest parts of sloped banks. Eucalyptus trees grow in several locations which happen not to have hardened revetments, but these few trees have precarious attachments to the bank and most are currently being undermined by periodic high flows.

R **Scattered native tree species**: Large trees native to the coastal plain still grow in a few locations below Canon Perdido Street. Western sycamores (*Platanus racemosa*) grow at six locations along both sides of the channel (Fig. 10-5). At three of these places, what appear to be more than one tree have taken root. No genetic or physiological data exist to resolve the possibility that these are actually multiple trunks diverging from the crown of a single root system, i.e. one individual tree. Three such trunks can be distinguished just upstream from the Bath Street Bridge, two trunks between Bath and Cota Streets, and two large trunks and two smaller ones just below the Mason Street Bridge. The occurrence at any one location of multiple sycamore trees (or a single individual which grew to have multiple trunks) growing nearly from the same spot does not change the ecological worth of such trees when such locations are notably isolated from each other. The joint canopy formed this way actually covers no more ground than that of single, very large trees such as the one on the right hand bank below De la Guerra Street. The trees must be accounted for as individuals, but their overall ecological value does not extend beyond the location they occupy on the banks. Counting all the large, apparently separate trunks as distinct trees brings the total within the project reach to 10 western sycamores. One coast live oak (*Quercus agrifolia*) and one battered cottonwood (*Populus fremontii*) also grow on the lower part of the banks. Additionally, four arroyo willows (*Salix lasiolepis*) and a pair of white alders (*Alnus rhombifolia*) have also survived periodic channel maintenance by the lucky chance of being rooted on the overbank above private revetments. In total, 18 large trees belonging to five species have been noted within the area to be disturbed by the proposed project.

R Were these not, in fact, solitary trees but parts of contiguous bands of trees, they would represent an ecologically significant element of the natural riparian community. That is not the case, however. Each has survived as an essentially isolated individual, and all are spread too far apart to form the core of any localized segment of riparian plant assemblage. No contiguous canopy exists and urban needs prevent any notable understory of riparian species from becoming established beneath these singular trees. These few singular trees constitute a biological resource best treated as individuals that hint at the nature of the plant community that once grew along

Mission Creek, but are now too sparse to influence the ecological structure and functions of Mission Creek.

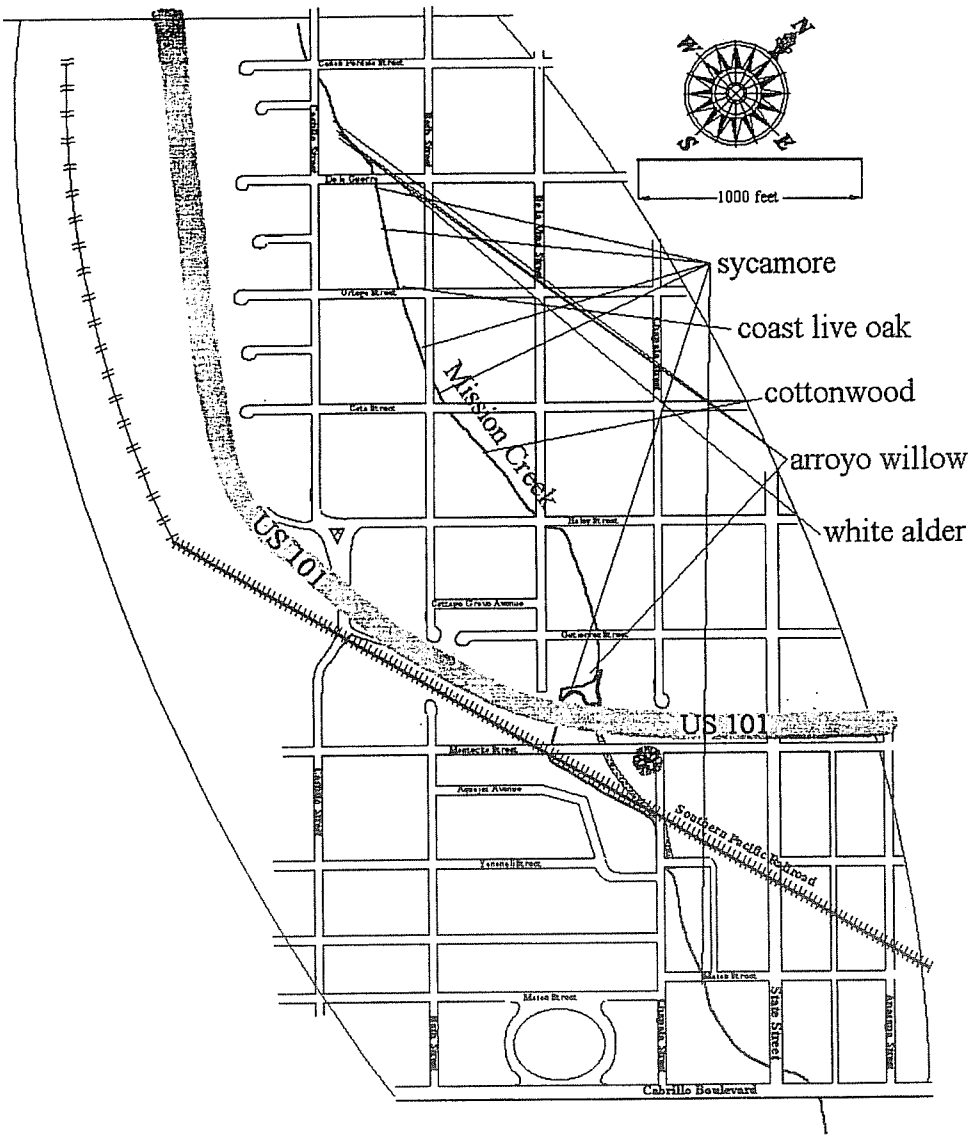



Fig. 10-5. Five species of native trees grow at various locations along Lower Mission Creek. Western sycamores grow in clusters (or a single individual has multiple trunks) just upstream of the Bath Street bridge, between Bath and Cota Street bridges, and immediately downstream of Mason Street bridge.

**Quality of stream bank habitat**: A modified Habitat Evaluation Procedure (HEP) was used to determine a quantitative description of existing stream bank habitat. All details of the calculations appear in Appendix C.

All totaled, the existing conditions of stream banks have a value of 0.48 habitat units.

10.2.3 **Wildlife**:

During field reconnaissances of the entire Lower Mission Creek channel in September 1997 (late summer) and May 1999 (late spring), a group of plant and animal species was noted, but this was not intended as a systematic and complete listing of all biota. The relevant plant species have already been mentioned. For the most part, only birds were seen directly, being active during mid-day. Included were Anna's hummingbird, black phoebe, yellow warbler, common yellowthroat, snowy egret, green-backed heron, red-shouldered hawk, mallards, and numerous shore birds on or around the lagoon on the south side of Cabrillo Boulevard. Local birding enthusiasts do not commonly scrutinize the lower reach because of the difficulties posed by access across private property. They thus have limited information about the importance of this reach as a sanctuary for birds in an urban setting. It may be important as a stopover focus for south-bound winter migrants. Lower Mission Creek falls within the geographic area included in the Audubon Christmas bird count (Joan Lentz, personal communication). Tracks of house cats and domestic dogs were seen regularly in mud along the creek, and less frequently were those of racoons, opossums, and skunks. Pacific tree frogs (*Hyla regilla*) have been seen (or heard) in late summer and spring. Indeed, during late spring males could be heard calling from concealed perches above head height. No other amphibian species have been seen in Mission Creek. Fish species are not numerous evidently, although individuals of those which live there can be plentiful. For example, partially-armored sticklebacks (*Gasterosteus aculeatus microcephalus)* were quite abundant in many places above the freeway and ranged between very young to large adult sizes, 15 to 70 mm at least. A single prickly sculpin (*Cottus asper*) was found above the Mason Street bridge. Topsmelt (*Atherinops affinis*) swam in estuarine water to feed above Mason Street, but did not go even as far as Yanonali in late spring. Striped mullet (*Mugil cephalus*) could be seen feeding closer to the State Street Bridge. No other fish species have been confirmed during recent field visits.

A large and diverse element of the biotic community fulfills an ecological role, important especially from the human point of view, largely without even being noticed as likely as not in urban Santa Barbara. Bats take a prodigious number of insects every night during spring, summer and early fall months. Without being mindful of their presence, residents and visitors enjoy evening activities with far less irritation from insects than would be the case otherwise. The undersides of bridges across Mission Creek probably provide a significant proportion of all roost sites in this region of Santa Barbara (Collins, 1999). In the general area of lower Mission Creek, deep crevices and hidden recesses within the structure of bridges probably constitute the majority of the type of shelter bats prefer during the daytime. Bark crevices and hollowed limbs or trunk of large trees afford shelter for some species. The California Department of Fish and

Game regards a species previously identified in the vicinity, the pallid bat (*Antrozous pallidus*), as warranting special concern. Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), also a State species of concern, roosts elsewhere in Santa Barbara County but has not been observed in Santa Barbara. The roost site known to be occupied by big-eared bats and closest to Mission Creek is north of the mountains, at the bridge where State Highway 154 crosses the Santa Ynez River (Collins, 1999). Reasonable estimates for population sizes and breeding success of bat species in lower Santa Barbara have never been attempted, nor have systematic trapping studies been conducted anywhere on the lower reaches of Mission Creek (Collins, 1999). The bare minimum of descriptive data indicate the presence of at least six additional species in the vicinity where flood control measures would be implemented, including: the Mexican free-tailed bat (*Tadarida brasiliensis*), the red bat (*Lasiurus borealis*), California myotis (*Myotis californicus*), Yuma myotis (*M. yumanensis*) the hoary bat ( *Lasiurus cinereus*), and the big brown bat (*Eptesicus fuscus*). Big brown bats use the bridge where Foothill Road crosses over Mission Creek as a roost site (Collins, 1999).

10.2.4 **Threatened and Endangered Species**:

Most Federally protected animal species, which depend on the microhabitats associated with riverine and estuarine conditions and whose historical range may have included the Mission Creek watershed or at least the higher elevations of the Santa Ynez Mountains, have been displaced from the lower reach by urban expansion and the concomitant loss of suitable habitat. These include four amphibians: the red-legged frog (*Rana aurora*), foothill yellow-legged frog (*Rana boyleii*), the southwest arroyo toad (*Bufo microscaphus*) and tiger salamander *(Ambystoma tigrinum*). Two bird species, Least Bell's vireo (*Vireo belli pusillius*) and southwest willow flycatcher (*Empidonax traillii extimus*), still might rarely occur as transients but neither would be able to nest successfully and fledge chicks from this narrow riverine strip. Both species may have bred here historically. The light footed clapper rail (*Rallus longirostrus levipes*) might once have inhabited marshy areas along the lowest portion of the creek, between the oxbow and what is now the harbor. Prior to historic development of the Santa Barbara area, California condors (*Gymnogyps californianus*) would have foraged over this stream bed on occasion.

Transients or established populations of Federally protected birds are not uncommon at the shore. Snowy plovers (*Charadrius alexandrinus nivosus*) regularly attempt to nest at Cabrillo Point. Their foraging habits would confine them to the strand only, and thus this shorebird should never venture up Mission Creek. Least terns (*Sternus antillarium*) migrate along the coast and thus are seen every year, but this small tern would only be present on the estuarine portion of Mission Creek and then only as a brief transient to hunt small fish. Brown pelicans (*Pelicanus californicus*) are regular and year-round inhabitants of the harbor, but also would never enter this project area under normal circumstances.

The lower part of Mission Creek affords significant habitat for two Federally endangered fish species, the tidewater goby and southern California steelhead. Adult steelhead use Mission

Creek as a migration corridor to spawning beds upstream, while young steelhead swim the reverse when physiologically mature enough to return to the ocean. A coastal, tidal lagoon forms in the summer months where Mission Creek empties into the Pacific Ocean, on the beach side of Cabrillo Boulevard. It provides the principal habitat for gobies and is essentially a marine environment.

10.2.4.1 **Tidewater Goby (*Eucyclogobius newberryi*, Federally Endangered)**:

R The estuarine conditions found in Mission Creek between Cabrillo Boulevard and Yanonali Street provide foraging habitat for tidewater gobies. The species was detected in the estuary in 1994 (Lafferty and Altstatt, 1995), specifically just upstream of the Mason Street bridge (Lafferty, 1998). Biologists from the USFWS, National Marine Fisheries Service (NMFS), and the Corps searched diligently but found no tidewater gobies anywhere in Mission Creek during site visits in May, 1999. Likewise, visual scrutiny of parts of the estuary during a low tide in early May 2000 turned up no sightings of tidewater gobies.

R As a generality about most populations of tidewater gobies, the life history of the species lasts about a year, although some evidence indicates a quite small fraction of individuals in some populations may live to a somewhat older age. Numerous recent experimental studies (U. S. Fish and Wildlife Service, 1999a) paint a combined picture of a species classically described as being "r-selected", i.e. one whose ability to disperse to unoccupied habitat, inherited tolerance of broad and sometimes variable ecological conditions of that habitat, and whose reproductive traits allow it to populate any suitable site in a very short time make the species' overall reproductive behavior approach nearly the maximum rate of which it is capable. The "r" refers to that tendency to turn out many young quite quickly in accordance with the intrinsic rate of reproduction characteristic of that species in these environments.

R Dispersal ability of tidewater gobies would appear to be a key trait in the life history. Concerns about its rapid disappearance from many formerly inhabited waters were a strong impetus to federal protection of the species. Yet since then, numerous reports of the species seemingly having been extirpated from a stream system it once indisputably occupied, then recolonizing it a few seasons later could be cited. Recent experimental data can be interpreted as showing the species has genuinely better talents for getting from an inhabited stream to nearby unoccupied habitat (Lafferty, et al., 1999) than was believed true when the Fish and Wildlife Service concluded it warranted Federal protection under the Endangered Species Act.

Coastal wetlands and their estuaries that get closed off seasonally by natural deposition of sand and cobbles, which in a previous era were widespread and isolated from each other between Agua Hedionda Lagoon (south of Oceanside, in San Diego County) and Tillas Slough where the Smith River discharges (Del Norte County), afforded excellent habitat for this small fish (Capelli, 1997). The species typifies a pattern of genetic and phenotypic differentiation among fish species (Swift, *et al.*, 1993) endemic to coastal California wetlands where the comparatively limited habitat at each location is also geographically and ecologically isolated from other similar habitats (Swift, 1989). Loss of that wetlands habitat poses a serious threat to the existence of natural populations (US Fish and Wildlife Service, 1994).

Although tolerant of nearly fresh water for short periods, it favors salinities established by the mix of fresh and estuarine waters, a moving zone that shifts back and forth with daily and seasonal flow and ebb of the tides, i.e in the range of 10 to 15 parts per thousand (Capelli, 1997: personal communication). Salinity of sea water along the California coast typically measures about 35 parts per thousand. California estuaries which normally have an extensive tidal flush twice a day and salinities between about 20 and 33 parts per thousand prove uninhabitable to *E. newberryi* (Cappelli, 1997). The fluctuations in both salinity and temperature measured at the lower end of Mission Creek (Figs. 10-2 and 10-4) exemplify the water conditions this species seeks out.

Reproduction takes place in lagoon-like settings with coarse sandy bottoms. Seasonal presence of the lagoon at the mouth of Mission Creek probably depends on a rough balance between runoff of fresh water coming down from the mountains, in the winter and spring by and large, and the summertime deposition by long-shore transport currents and local wave action of a sandbar which blocks the mouth of Mission Creek. Tidewater gobies spawn in such lagoons, where proper conditions of salinity, water temperature, and coarse sandy bottoms persist from spring or early summer through the onset of winter rains (Swift, *et al.*, 1989). Males establish small breeding territories, scoop out small depressions, then wait for females lay eggs in the depressions. Males may guard eggs and young fry from several females.

The estuarine conditions above Cabrillo Boulevard provide important food resources for tidewater gobies. The species was detected there in 1994 (Lafferty and Altstatt, 1995). Structural alterations of Lower Mission Creek could conceivably have an impact on tidewater gobies in that estuary and the lagoon to the south of Cabrillo Boulevard.

Tidewater gobies seemingly will eat whatever is available that is of about the right size, including small assorted crustaceans, the aquatic larvae of many insects, and snails (Irwin and Soltz, 1984; Swift, *et al.*, 1989). The species has evolved in transient coastal environments which favored the physiological ability to convert those nutrients into large numbers of young. Such species are also prone to sudden disappearances of local populations. Over time, they usually exhibit a pattern of very high numbers for a few generations, then dramatic crashes of numbers. Often dispersal from nearby populations brings new groups of genes into a local population, which may stimulate a quick resurgence of numbers. This general pattern may lie behind the seemingly low numbers of tidewater gobies in the Mission Creek system over the last decade.

**Critical habitat for gobies**: Critical habitat for tidewater gobies has been designated (U.S. Fish and Wildlife Service, 1999b). All the watersheds included in that decision occur to the south of Aliso Creek, in Orange County. Mission Creek does not provide habitat critical to the continued existence of tidewater gobies.

10.2.4.2 **Southern California Steelhead (*Oncorhynchus mykiss*, Federally endangered)**:

R Mission Creek typifies the numerous streams suitable for steelhead located south of the Santa Ynez River, streams whose watershed was comparatively limited by the mountains to the north and the streams themselves fairly short and relatively small, where in times past young fish swam to sea and adult fish returned to upper reaches as allowed by the runoff conditions of southern California's climatic irregularities (Cardenas, personal communication, 1998; Spina, personal communication, 1998; Trautwein, personal communication, 1997). Historic changes to watersheds and the riparian communities along streams which followed the settlements of and expansion throughout coastal California by Europeans, and were brought about by their systematic institution of agrarian economies, quickly degraded steelhead streams such as Mission Creek to greater or lesser extent. Urbanization continued that degradation. Nonetheless, it remains among the coastal streams of southern California considered by NMFS as a significant migratory corridor for steelhead when that agency designated the population of steelhead resident in the coastal waters of southern California an Evolutionarily Significant Unit (ESU) and listed the species as endangered (National Marine Fisheries Service, 1997). The California Department of Fish and Game concurs, reckoning Mission Creek as affording irregular but genetically vital opportunities for adult steelhead to reach upstream spawning beds during the winter months in small numbers (Cardenas, 1998).

The natural bottom, albeit slightly squared in profile by periodic channel maintenance and constrained by numerous private revetments of assorted design, still promotes the capability for steelhead to make a winter run up Mission Creek (Cardenas, 1998; Spina, 1998) and young steelhead trout, often called smolts, to swim down its length. Concrete, trapezoidal channelization of the stream bed and banks upstream of this project probably hinders potential migration both directions in Mission Creek (Cardenas, 1998). Despite this physical impediment and the existence considerably farther upstream of a small dam across Mission Creek to catch debris, the California Department of Fish and Game regards Mission Creek to be among the better streams for anadromous trout south of Point Conception because it still affords satisfactory capacity for salmonids to navigate the channel (Cardenas, 1998).

Part of the reconnaissance phase study which the Corps completed in 1995 sought definitive evidence regarding steelhead in Mission Creek. Systematic live trapping for salmonid fishes in Mission Creek did not detect migratory smolts in fish traps erected between Haley and Gutierrez Streets between April 26 and June 6, 1995. Electroshocking all the likely runs and riffles upstream from that location between April 26 and May 16, 1995 also did not disclose salmonid fish with the phenotypic traits of steelhead (Corps of Engineers, 1995). In total, eight trout were captured throughout the watershed, one near Oak Park and the other seven in Rattlesnake Creek, above its confluence with Mission Creek. Without exception, these fish each had all the features of resident, non-migratory rainbow trout (also recognized taxonomically as *Oncorhynchus mykiss*), were the size of rainbow (average length = 190 mm, standard deviation = 29.6), and all but one were judged by analysis of scales to be nearly two years old. The single

largest fish was more than two years old. Trout of this age, if they were steelhead, would ordinarily exhibit all the changes of appearance that identify them as steelhead smolt. Absence of these features indicates these eight would never display distinctive steelhead attributes.

R The sporadic records of large salmonid fish in the Mission Creek watershed has been the source of differing opinions about its contemporary importance in the life history of steelhead. For example, eleven years elapsed between documented sightings, 1984 to 1995, yet since the spring of 1998 many observations have been reported. The following summaries are indicative of the seemingly irregular appearance of steelhead in Mission Creek:

1984 — Small trout feeding near the Museum of Natural History in early June were identified by a specialist in marine mammals as steelhead (Santa Barbara News-Press, June 3, 1984);

April to June, 1995 — Part of the reconnaissance phase study which the Corps completed in 1995 sought definitive evidence regarding steelhead in Mission Creek. Systematic live trapping for salmonid fishes in Mission Creek did not detect migratory smolts in fish traps erected between Haley and Gutierrez Streets between April 26 and June 6, 1995. Electroshocking all the likely runs and riffles upstream from that location between April 26 and May 16, 1995 also did not disclose salmonid fish with the phenotypic traits of steelhead (Corps of Engineers, 1995). In total, eight trout were captured throughout the watershed, one near Oak Park and the other seven in Rattlesnake Creek, above its confluence with Mission Creek. Without exception, these fish each had all the features of resident, non-migratory rainbow trout (also recognized taxonomically as *Oncorhynchus mykiss*), were the size of rainbow (average length = 190 mm [about 7½ inches], standard deviation = 29.6 mm), and all but one were judged by analysis of scales to be nearly two years old. The single largest fish was more than two years old. Trout of this age, if they were steelhead, would ordinarily exhibit all the changes of appearance that identify them as steelhead smolt. Absence of these features indicates these eight would never display distinctive steelhead attributes;

May 24, 1995 — A single fish between 12 and 13 inches in length and described as having the "hooked lower jaw" reminiscent of steelhead was landed with a barbless fly from a run in Rattlesnake Creek. The fish was photographed, but an effort to take scale samples from it was fruitless (Trautwein, letters, 1995a, 1995b). "Additionally, two fish measuring an estimated 12" each were observed in a pool approximately 100 yards upstream from the site where the largest fish was captured." Other trout seen in nearby pools the same date were of the size range reported by the Corps' study, and thus could plausibly be resident and non-migratory rainbow trout;

1998 and1999 — Following the heavy runoff from El Niño rains in the spring of 1998, numerous large fish were reported at several locations above Oak Park in the fall of 1998. Knowledgeable ichthyologists were convinced by the body length, body depth at the pectoral fins, color patterns, and general behavior that these salmonids could not be anything other than steelhead (Cardenas, 1998; Johnson, 1999; Greenwald, 1999). By late June of 1999 very small fish were seen to accompany these larger adults in some of the larger pools near the Museum of Natural History and upstream from there as far as the confluence of Mission and Rattlesnake Creeks (Johnson, 1999).

To date, no genetic data has been obtained from any of these fish. Therefore, they cannot be declared definitively as from the southern evolutionary genotypic stocks;

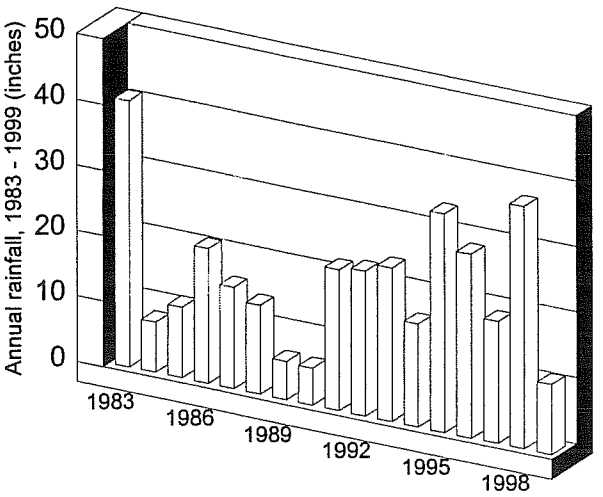
2000 — A female 27 inches in length and a male 23 inches long were documented spawning in poor water and substrate conditions between de la Guerra and Ortega Streets on March 14th. The female made at least three clutches of eggs. The male was seen to fertilize one of them. Later in March, approximately 100 salmonids of the size typical of smolt were seen repeatedly in pools in Oak Park. They seemingly decamped after heavy rains in April, but no observations of them swimming to the ocean have been reported. Two salmonids, also of typical size to be smolt, were observed in salt water below the Mason Street bridge on the 4th of May (Moeur, 2000, field records).

To date, no genetic data has been obtained from any of these fish. Therefore, they cannot be declared definitively as from the southern evolutionary genotypic stocks; However, that some among these fish seen over the last 15 years are steelhead based on physical traits (e.g. size of pair seen spawning in March 2000) and behavior, and therefore that Mission Creek has the potential still to provide suitable habitat conditions in some locations, seems no longer a debatable assertion.

R **Climatic influence over suitable flow conditions**: Irregular appearance of steelhead in coastal California streams seems to be a widespread trait within this part of the species' range. Steelhead belonging to the southern evolutionary population appear rather opportunistic in their migratory behavior, both in the number of individuals who make the ascent in any given year — in fact, years when none are seen anywhere in the creek are not uncommon — and the time of year when they enter the watershed. River flow seems to be the factor which most clearly prompts adults fish to try to reach spawning areas in southern California coastal streams. Since the quirks of winter storm patterns in this region cause quite unpredictable flow patterns from one year to the next, their migratory tendencies are controlled by this climatically irregular but annual phenomenon (Cardenas, 1998).

Rainfall data for the last 17 years are indicative of the variability in climate in the watershed of Mission Creek. Between January 1983 and December 1999, average total rainfall measured at the Santa Barbara Sanitation Station has equaled 19.35 inches. In this Mediterranean climate, very little of that rain comes between May and October, as shown by monthly average totals (Fig.10-6). More than three quarters (78%) of the total annual rain falls in December, January, February, and March.

Four accompanying graphs show total rainfall measured in December, January, February, and March for each year between 1983 and



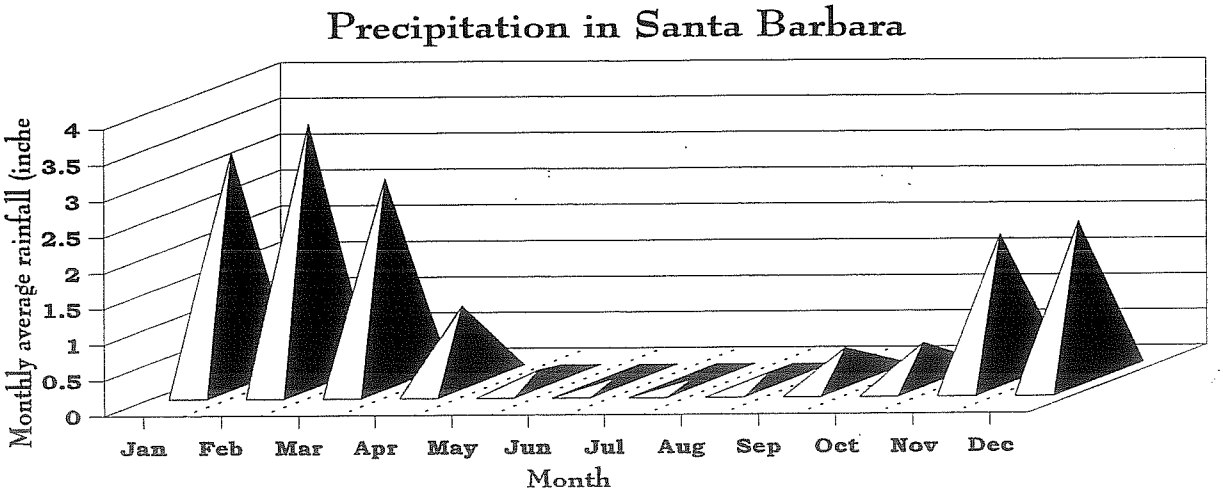




Fig. 10-6. Records of annual precipitation from 1983 through 1999 (upper panel). Average total precipitation was 19.35 inches during this period. Source: California Department of Water Resources; http://cdec.water.ca.gov/cgi-progs/staMeta?station_id=SBR.

Monthly precipitation in Santa Barbara averaged from records between 1961 and 1990 (lower panel). Source: National Weather Service, San Francisco, and made available on the web at http://www.washingtonpost.com/wp-srv/weather/longterm/historical/data/santa_barbara_calif.htm

2000. During the four months of the typical rainy season when nearly all upstream migration by adult steelhead occurs, climate patterns can bring notable rains in December in some years, and very scant rains in others. For example, five to seven inches were recorded during December in1983 and 1984, but rainfall in December of both 1989 and 1990 was virtually nil. In a general way, these records show the rather erratic nature of rainfall in each of these four months from one

year to the next. As another example, the very heavy rains in January 1995 (about 18 inches in that month alone) were markedly greater than January of 1994, less than 2 inches. Virtually no rain fell in February of 1997 but a year later February total rainfall was greater than 20 inches. In fact, February, January, and March have the largest variability in monthly rainfall total, as indicated by standard deviations of 5.09, 4.63, and 3.06, respectively.

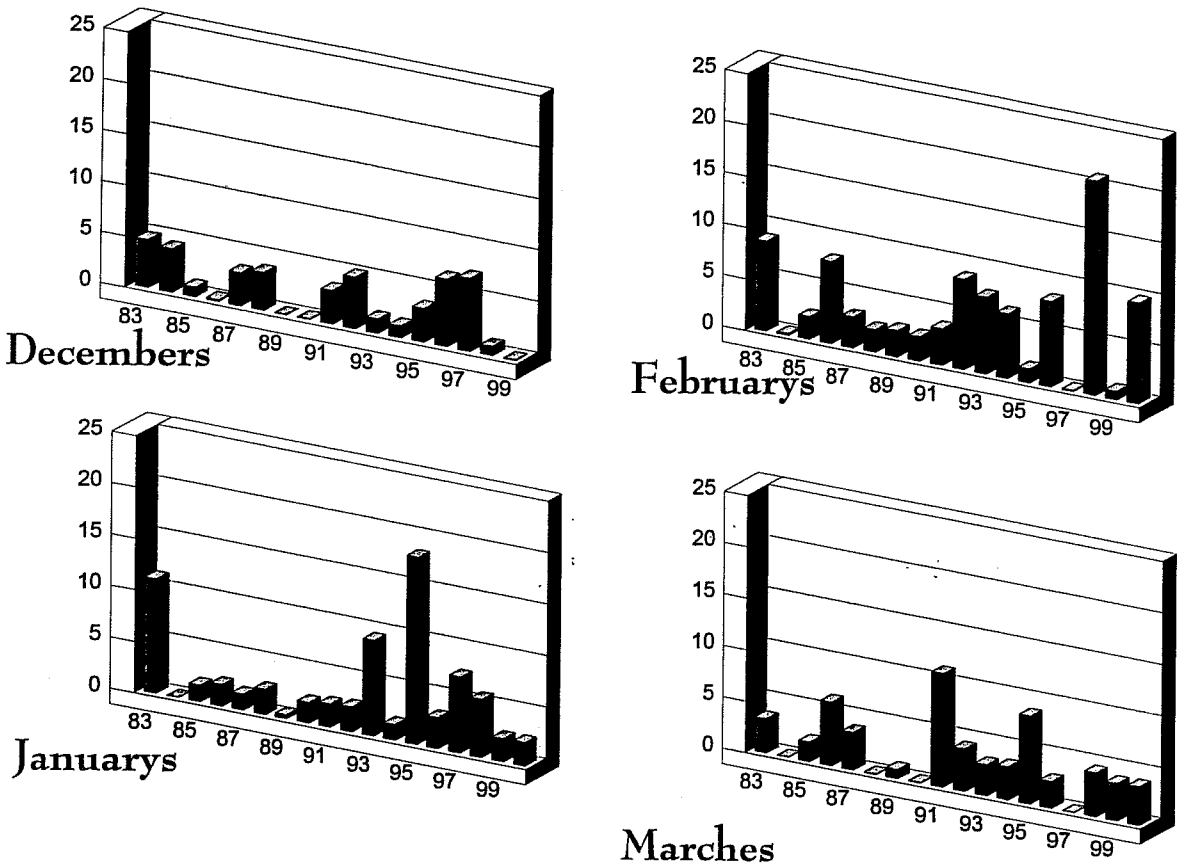



Fig. 10-7. Total monthly rainfall for the typical rainy season in Santa Barbara, 1983 to 2000 except for December. (Source: California Data Exchange Center; http://cdec.water.ca.gov/cgi-progs/staMeta?station-Id=SBR).

The inconsistency between years is often matched by inconsistency between successive months within one rainy season, e.g. the 18 inches of January 1995 were followed by scant rains in February (less than 2 inches), and moderate amounts again in March (about 8 inches, total). As another example, the most recent year of El Niño climatic patterns, 1998, brought about 2½ inches in January, close to 21 inches in February, and only about 4 inches in March.

Steelhead from this region have inherited the tendency to migrate up streams in this region sometime between January and the end of March, but only sporadically from one year to the next in response to the rather fickle patterns of rain during those three months. The inconstant nature of coastal streams such as Mission Creek may well have selected against behavioral tendencies to migrate annually and without fail to spawning beds in the upper portions of the water shed when climatic conditions were not reliable enough from one year to the next to count on be able to reach those beds.

R The reverse migratory behavior young steelhead undertake, leaving the stream in which they were spawned and entering the open ocean, may also happen rather unpredictably for the same climatic reasons. Neither experimental nor systematic observational data from steelhead populations of southern coastal streams about the duration of this passage to the ocean have been gathered sufficient to generalize about the species' life cycle in Mission Creek (National Marine Fisheries Service, 2000). Salt water imposes wholly different physiological requirements on fish when compared to life in fresh water. Steelhead cannot just leap from one to the other when at an appropriate point in their life history. A steady sequence of metabolic transformations happens as "freshwater genes" become inactive gradually while "saltwater genes" start to express their phenotypic characteristics. In a jocular way which, which nonetheless refers to a very complex suite of biochemical and physiological changes that in fact biologists do not yet understand at all well, juvenile steelhead are said to "smoltify". They prepare for marine life, having started out life in fresh water. Stream flow conditions, and weather indirectly, seem to initiate these changes when juvenile steelhead are old enough.

R Smoltification probably begins upstream and juveniles work their way down toward saline water as they become better prepared to live in it, then probably complete the requisite physiological changes there. Evidently the last of this physiological shift takes place while smolts wait their time in diluted salt water. The estuary of Mission Creek still suffices for this requirement for of their life cycle despite its generally poor quality as aquatic habitat. No data regarding their tenure in the lower creek exists. Some individuals may wait only a few days, others a week or two (Stowe, 2000; Cardenas, 2000). It obviously depends on the speed of changes necessary for them to tolerate salt water after the first phase of life in fresh. Those complex changes transform them physiologically from young trout into steelhead smolt, ready to swim finally to the ocean when stream flow or other environmental conditions, also not understood, permit.

R **Critical habitat for steelhead**: Critical habitat for steelhead (National Marine Fisheries Service, 1999a) evidently includes Mission Creek, although detailed maps and watershed descriptions are not available for inclusion in this BA. NMFS identified hydrologic units containing critical habitat for southern California steelhead and that called Santa Barbara Coastal (hydrologic unit No. 18060013) encompasses Mission Creek. In and of itself, this designation would require implementation of the flood control project in a way so as not to "appreciably

diminish the value of critical habitat for both the survival and recovery" of steelhead, and consultation with NMFS under Section 7 of the Act.

10.2.4.3 **Southwestern Pond Turtle (*Clemmys marmorata pallida*, California species of concern)**:

Systematic records maintained at the Natural History Museum of reptiles from the Santa Barbara area begin in the early 1960s (Collins, 1999). They document repeated sightings of individuals above Foothill Road, in the Rattlesnake Creek portion of Mission Creek's watershed. Since then, no records indicate pond turtles anywhere in Mission Creek below Rocky Nook Park.

This species is native to California, west of the Sierra for the most part, and is thoroughly aquatic in its habits. It was very likely to have been present throughout the watershed historically. Pond turtles have a decided preference for localities with permanent aquatic features, such as the margins of lakes, small ponds, permanent and deep pools on slow moving creeks, fresh water marshes, and irrigation ditches where water is always present. Settings where cattails and other aquatic vegetation are undisturbed and grow from a rocky or muddy bottom appear to be better suited. These habitat requirements no longer exist within the construction limits of flood control on lower Mission Creek. Indeed, the two local biologists most knowledgeable of reptiles in these parts of Santa Barbara County spoke of never having seen this species on the lower part of Mission Creek (Collins, 1999; Hunt, 1999), despite several searches specifically for pond turtles in Mission Creek. The latter biologist described lower Mission Creek as "highly unsuitable overall habitat" for pond turtles (Hunt, 1999). No turtles of any size or shape were seen during any of the four surveys of Mission Creek, nor have the distinctive tracks turtles make in soft mud ever been seen.

Pond turtles are known to inhabit a tributary of the Laguna Channel, roughly half a mile to the east of Mission Creek. Moreover, this location appears sufficiently good that *C. marmorata* can reproduce here, as judged by the range of sizes seen basking in the area (Collins, 1999).

All evidence would appear to indicate southwestern pond turtles no longer inhabit this section of Mission Creek.

10.2.5 **Moreton Bay Fig**:

An immense tree, venerated for its size and age as a conspicuous landmark by residents of and visitors to the City of Santa Barbara, grows near Lower Mission Creek, although its genetic adaptations evolved in the coastal subtropical climate of northern Australia. By chance, those adaptations also conform to the maritime climate that prevails immediately inland along coastal southern California. The Moreton Bay Fig (*Ficus macrophylla*) was transplanted as a young tree at the southwest corner of Chapala and West Montecito Streets (Fig. 10-8) in 1877. It has thrived at this site and is said to be among the very largest of its species outside its native range, possibly the biggest in North America. Despite the changes during the last century that were not foreseeable when it was planted at this location — changes away from pastoral and toward more

urban circumstances that have prompted less than optimal soil and water conditions, involving paved roads crossing the northern and eastern sides of its root complex, occasional trenching which passes through parts of its root system along both those municipal roads for installation of pipes, a parking lot paved with asphalt and compacted soils on its southern side — between 1975 and 1991 its trunk expanded 11% in diameter, as measured 5½ feet "above the floor of the buttress roots" and the canopy had grown slightly in height (Britton and Froehlich, 1991). By 1991, the fig tree had a canopy 172 feet in diameter, reaching 76 feet in height.

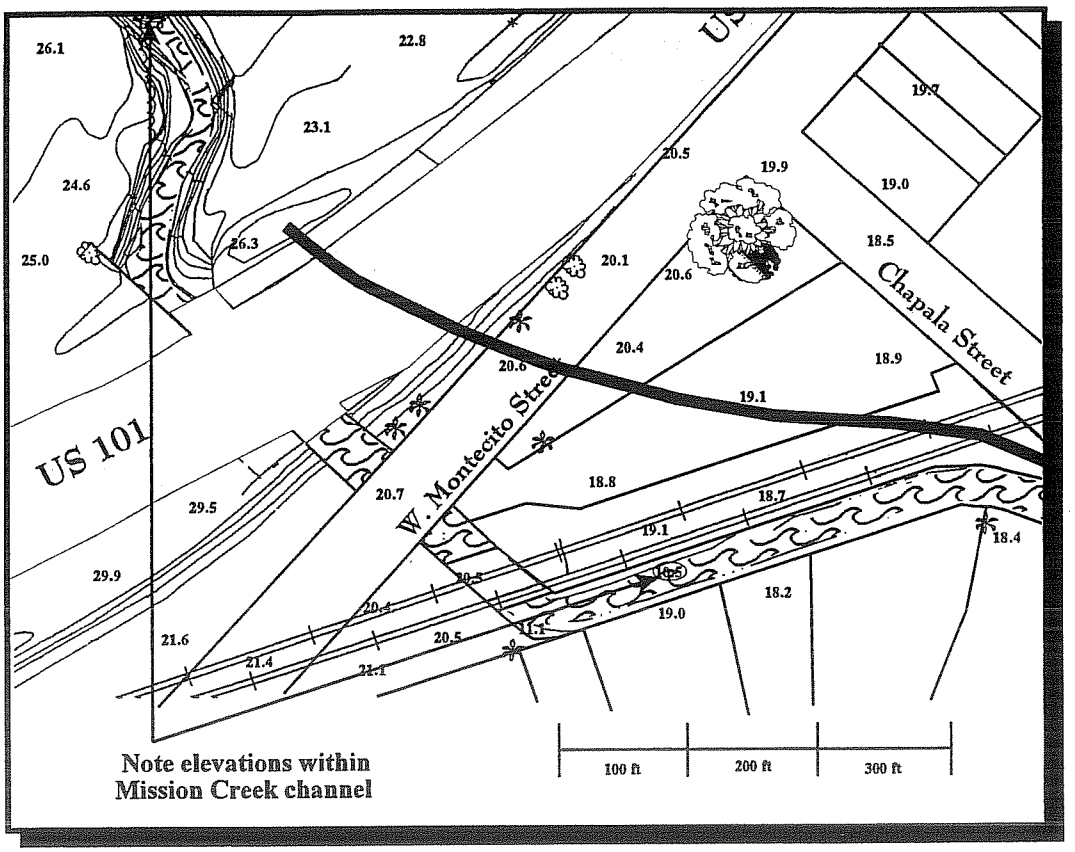



**Fig. 10-8.** Vicinity of the Moreton Bay Fig, at the southwest corner of Chapala and West Montecito Streets, the "oxbow" of Lower Mission Creek, and the approximate location and size of the box culvert (heavy, dark line) which would bypass the oxbow. Numbers sprinkled throughout the map give spot elevations in feet above sea level. Most property boundaries and other distracting features have been omitted, except where they aid in depicting the immediate surroundings of the Fig Tree and the channel of Mission Creek. The bridge at Gutierrez Street is shown in the upper left corner, and a scale in the lower right.

The sandy loam soil at this site evidently provides sufficient water and micronutrients for sustained growth. Soil samples taken from augured holes 40 inches deep on the east side of the tree show a progression toward pure sand (Rogers, 1995). Given the way most deciduous trees of this growth form develop, the bulk of its root system would lie within the drip line of the

canopy, and possibly reach to a considerable depth. Within the last decade, freeway construction along the north side of Montecito and placement of a sewer line that required a trench 8 feet deep on the west side of Chapala disturbed secondary roots but none of significant size, according to the Arborist for Santa Barbara, Mr. Dan Condon (Britton and Froehlich, 1991).

The tree was planted on ground now about 20 feet above sea level (Fig. 10-8). The tree may have been planted intentionally on a slight hummock, because spot elevations both to the northeast and to the south and southwest of it (ranging from 19.7 to 18.9 feet, and 19.1 to 18.8 feet, respectively) incline away from the tree. A natural slope, slight though it may be, exists between the fig tree and the channeled and angular segments of Mission Creek. In the channel segment immediately south of the Union Pacific Railroad tracks and distinctive for being lined with cut sandstone blocks, the bottom of Mission Creek lies at an elevation of 10.5 feet. This is 2.1 feet lower than its elevation, 12.6 feet, halfway between the Gutierrez Street bridge and the beginning of the oxbow upstream of US 101. Based on these elevation differences, the major portion of water supply from which the fig's roots draw must originate from a water table at least 10 feet below the present ground surface. Close to its buttress roots, the water table is said to lie between 15 and 18 feet deep (Britton and Froehlich, 1991).

Given the lay of the land near the oxbow, subsurface water may pass through native soils on the eastern side of Lower Mission Creek in a general pattern from the northwest toward the southeast. The fig tree, on its slight hummock, likely draws water from the subsurface flow passing on the northeast side of the tree.

### 10.2.6 **Staging Sites for Equipment and Temporary Stockpiles of Materials**:

Three locations along the creek would become temporary staging areas. Whether each would function throughout the duration of the project construction has not yet been determined.

That nearest the ocean would be located between the railroad tracks and Yanonali Street. It is currently a vacant lot with bare dirt and significant vegetation.

A site approximately in the middle of the project may also be used for another purpose at the end of construction. This is the vacant lot adjacent to the oxbow and owned by CalTrans. A chainlink fence encloses it on the west and prat of the north side, with a commercial building and parking lot comprising the rest of the north side. It ends at the edge of the creek on the east and south. The surface of that lot has annual grasses throughout and apparently gets mowed on occasion. Some ornamental trees grow in the northeast corner. A single large willow grows above the bank of the creek in the southeast portion of the lot.

A paved parking lot behind the church located at the corner of Canon Perdido and Castillo Streets would become the upstream staging site. It provides a convenient access ramp to the creek bed. The parking lot abuts the creek on the west. Aside from that edge where non-native plants have been cultivated, no trees or vegetation exists on this lot.

## 10.3 CITY OF SANTA BARBARA GENERAL PLAN AND POLICIES FOR BIOLOGICAL RESOURCES:

Evaluation of environmental effects caused by construction of flood control structures on Mission Creek shall not be at odds with general goals established by the City of Santa Barbara. Evaluations of consistency with each of the City of Santa Barbara's plans and policies for biological resources are provided in Section 4.2.3.4 of this EIS/EIR.

To reiterate them:

### 10.3.1 Conservation Element Biological Resources Goal:

- Enhance and preserve the City's critical ecological resources in order to provide a high quality environment necessary to sustain the City's ecosystem.
- The habitat of rare and endangered species shall be preserved.
- Intertidal and marine resources shall be maintained or enhanced.
- Programs shall be developed to maintain a productive urban biotic community.

### 10.3.2 Conservation Element Biological Resources Policy and Implementation Strategy:

- A set of land-use suitability guidelines shall be developed for use in land planning and the environmental review process.
- Where not preempted by the Federal Flood Insurance Program, land-use regulations will be developed for the creek influence zones of Mission, Sycamore, San Roque, and Arroyo Burro Creeks.

  a. Assign the task of conducting a biological study of the creek influence zones to the Community Development Department. This study is to determine the general land uses within the zone which would be compatible with the maintenance of the existing biologic communities of the creeks, and is not intended to consider the development of public recreation facilities with the creeks.

  b. Enact a flood control and creek ordinance which would include provisions to restrict channelization in natural creek bottoms and structural developments within the 100-year floodplain in natural creek areas.

10.3.3 **Location of Coastal Program Water and Marine Environmental Policies**:

- The City, through ordinance, resolutions, and development controls shall protect, preserve, and where feasible restore the biotic communities designated in the City's Conservation Element of the General Plan and any future annexation to the City, consistent with the PRC Section 30240.

- The riparian resources, biological productivity, and water quality of the coastal zone creeks shall be maintained, preserved, enhanced, and where feasible restored.

- Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) Necessary water supply projects, (2) Flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) Developments where the primary function is the improvement of fish and wildlife habitat.

## 10.4 EVALUATION OF FLOOD CONTROL ALTERNATIVES IN RELATION TO BIOLOGICAL RESOURCES:

R 10.4.1 **Implications of Design Alternatives, both Structural and the No Action Alternative**:

This Feasibility Study examines several structural Alternatives intended to increase lower Mission Creek's ability to carry storm water flows directly to Santa Barbara Harbor, rather than having them spill out of the existing channel. The degrees of flood control benefits and environmental effects differ among the Alternatives. Every structural Alternative evaluated in the EIS/EIR would initially reshape the existing stream channel and its banks. None can be accomplished without digging the existing streambed, the toe of the banks at the edge of the stream, and the banks which now confine the streambed. Digging must diminish such ecological values as presently characterize the creek by removing the physical features of the creek bed and adjacent banks. It is these very features which confer ecologically useful attributes and the extant habitat properties to Mission Creek. Those features would disappear as excavation proceeds. Some Alternatives would require less digging than others and environmental effects would differ among them therefore.

The details of mechanical excavation, shifting of materials, construction of walls and banks, design shape and size of the finished streambed and its newly made banks, and environmental components which constitute the complete project description of each Alternative

are presented elsewhere (Chapter IV, §F, Tables 8 and 9 of the Main Report, and Section 3 of this document). Each structural Alternative is intended to function for a period of 50 years.

Structural Alternative Nº 12 has been identified as that which would return the greatest amount of flood control and environmental benefits per dollar spent. It is the recommended Alternative. The environmental consequences of two other structural Alternatives, Nºs 6 and 8, are also evaluated. Sections 3.4 and 3.5 of this document explain the rationale for focusing on these three and excluding eight other structural Alternatives from further analysis.

The Feasibility Study also examines the consequences of not building any form of flood control, i.e. the No Action Alternative. No excavation of existing streambed or its banks would occur as explicit elements of Alternative Nº 1. The decision to adopt Alternative 1 leads also to environmental effects which need to be evaluated over the same life time considered for structural plans. In effect, the No Action Alternative amounts to an expectation of conditions in the future in the absence of implementing any of the structural Alternatives, so called as "the future without project".

All Alternatives would entail some level of periodic maintenance to retain the conveyance capacity of this portion of Mission Creek. The environmental effects of future maintenance constitute a distinct part of the overall evaluation.

The analyses of various environmental effects of specific structural Alternatives have been weighed against the future without project. Differences between the alternatives measure the net changes caused by that specific Alternative. Where that net change turns out to be negative, the project design would have overall impacts and appropriate mitigation to rectify that effect would be considered. In contrast, a net change of positive value reflects an improvement to environmental conditions attributable to the design of the project. Comparisons are drawn primarily between Alternative12 and Alternative1.

Analyses of environmental effects make use of a simple convention. The HEP analysis (Appendix C) evaluates the projected changes in habitat quality by separating the proposed project into three separate reaches. They are identified by finished width of the streambed as designed for Alternative 12:

- reach 1 - 43 feet wide, from Canon Perdido Street to Haley Street, riverine in nature;
- reach 2 - 50 feet wide, from Haley Street to Highway 101, riverine, and;
- reach 3 - 60 feet wide, from Yanonali Street to Cabrillo Boulevard, estuarine properties.

10.4.2 **Alternative 1: No Action Alternative (Future Without Project Conditions)**:

R The following analysis assumes that there would be no changes of City policies (§10.2) related to development along creeks.

R Habitat quality in the future would be influenced considerably by property owners' concerns for erosive damage to their land, just as in the past when such protective behavior resulted in virtually every portion of the creek within the project area being subject to various

methods of bank stabilization. Often, the edges (or more than that even) of the streambed have been incorporated into those stabilization efforts as well. It seems a prudent action to undertake as a property owner, for there appears to be less erosion as a result. Unintentionally, though, a revetment fashioned at one location on the creek frequently redirects the stream in an unforeseen way; it starts eroding a section of bank and toe which had not previously been eroding. The property owner at the new erosional site reacts in the same way and as finances allow builds additional revetement. The hydraulic cause and effect sequence, erosion arrested in one location then inducing erosion somewhere else followed by yet more hardening of banks and streambed to forestall that erosion, begins anew. Since each individual effort removes plants, then leaves the surface less habitable for re-establishment of vegetation, and possibly fills portions of the streambed through the need to safeguard the toe of the banks, habitat quality would tend to decrease in a patchy and locally irregular manner over time. In the event no flood control project were built here, the decisions to make irregular and shifting investments in bank protection without an overall understanding of broader hydraulic effects would continue unchanged. As an unintended result habitat quality would be expected to decline from existing conditions.

R 10.4.2.1 **Impact Analyses**:

R The following analyses of potential environmental impacts from flood control measures recognize for all Alternatives two separate types of habitat, namely the aquatic environs of the stream bottom itself, and the extant vegetation along the banks of Mission Creek. Additionally, individual native trees have been included. These trees represent isolated patches of what historically would have been the canopy of riparian plant community. As the trees are widely separated, their functional importance in establishing the canopy layer of a plant growth is much reduced. They have been treated as isolated individuals whose loss must be made up, but whose ecological import has been factored into the overall habitat quality of bank vegetation.

R **Aquatic habitat**: With spatially haphazard and temporally irregular removal of some plants followed by more or less undisturbed further growth, conditions of both the stream bottom itself and the toe of the banks which extend to the stream's margins along Lower Mission Creek could be expected to fluctuate somewhat in habitat value over a run of years. Eventually, this irregular rise and fall of habitat values, in which property owners spend money and time to remove channel blockages and armor the toe against scouring currents, would lead to more extensive patchwork efforts while natural processes steadily undermine those efforts. Aquatic habitat quality should diminish slowly over a span of several years in the absence of coordinated flood control and stream bank erosion solutions.

R In addition, maintenance needs by the County to retain the channel's current conveyance capacity would periodically affect aquatic habitat in Mission Creek. Historic rainfall patterns and the consequent accumulation of sediments should not change in any foreseeable way. Maintenance would be indicated when a section of the channel has lost about 15% of its capacity.

In 1997, approximately 350 $yd^3$ of sediments were cleaned from the streambed between Canon Perdido Street and the freeway, for instance. A rough pattern of de-silting about once every three years has prevailed recently, and should not be different in the future. Historically, this level of aggradation has occurred only in the portions of the creek upstream of the estuary. No sediment removal has been needed in the estuary itself. The analysis assumes sediments and all the plants growing in them would be removed from at least 10% but not more than 25% of the creek bed upstream from the freeway in those occasional years when the channel has lost at least 15% of its conveyance capacity. The needs for more diligent maintenance in some years compared to others ought to cause somewhat erratic fluctuations of aquatic habitat value, probably following overriding climatic cycles. A sequence of winters when comparatively little rain falls could result in less vigorous maintenance activities. In consequence, overall quality of aquatic habitat would probably rise as more plants become established in the channel and small scour pools become quasi-permanent. A single season of heavy rains could necessitate more thorough removal of debris, sediments, and existing plant growth. The result would be a temporary diminution of habitat quality. In the long view, these fluctuations would take on a somewhat cyclical pattern.

R Although reaches 1 and 2 are both riverine in character, projected habitat quality would change more in the first reach than the second (Fig. 10-9). This difference can be ascribed mainly to a lower proportion of existing disturbances to the streambed between Canon Perdido and Haley Street (reach 1), than the second reach where a considerable part of reach 2 has concrete on the bottom or against the sides and a comparatively uniform monotony of creek substrate. In effect, there is already less to degrade between Haley Street and the freeway so the same level of preventive hardening of stream edge and toe would cause a smaller reduction to habitat quality than it would upstream in reach 1. Similarly, periodic cleaning of the channel bottom would remove from reach 1 more features which contribute to its overall habitat quality than would happen in reach 2 where concrete surfaces and toe protection outweigh natural streambed.

R Comparatively little fluctuation would occur within the estuary, as well. Reach 3 seems to have come already to a steady state in which such stream bottom and toe protections as were once necessary have largely accomplished their purpose, and in part because stream currents slow down inherently as they begin to push against tidal influxes through this reach. Finally, the apparent equilibrium of seasonal deposition and then erosion of sediments in the estuary means no loss of habitat quality due to channel maintenance, which would not be required in reach 3.

Over the 50 years considered, average ecological values for reaches 1, 2, and 3 are projected to be 0.36 HU, 0.11 HU, and 0.19 HU, respectively. When added, they give a net value of 0.66 HU. These projections indicate a slight, and possibly negligible change from existing aquatic habitat conditions: 0.4 HU in reach 1, 0.13 HU in reach 2, and 0.20 HU in reach 3. Long-term decreases would occur in reaches 1 and 2, where periodic channel maintenance and more private investments in bank and creek stabilization are anticipated. The projected net decrease, 0.07 HU over 50 years, is slight and possibly would not even be perceptible.

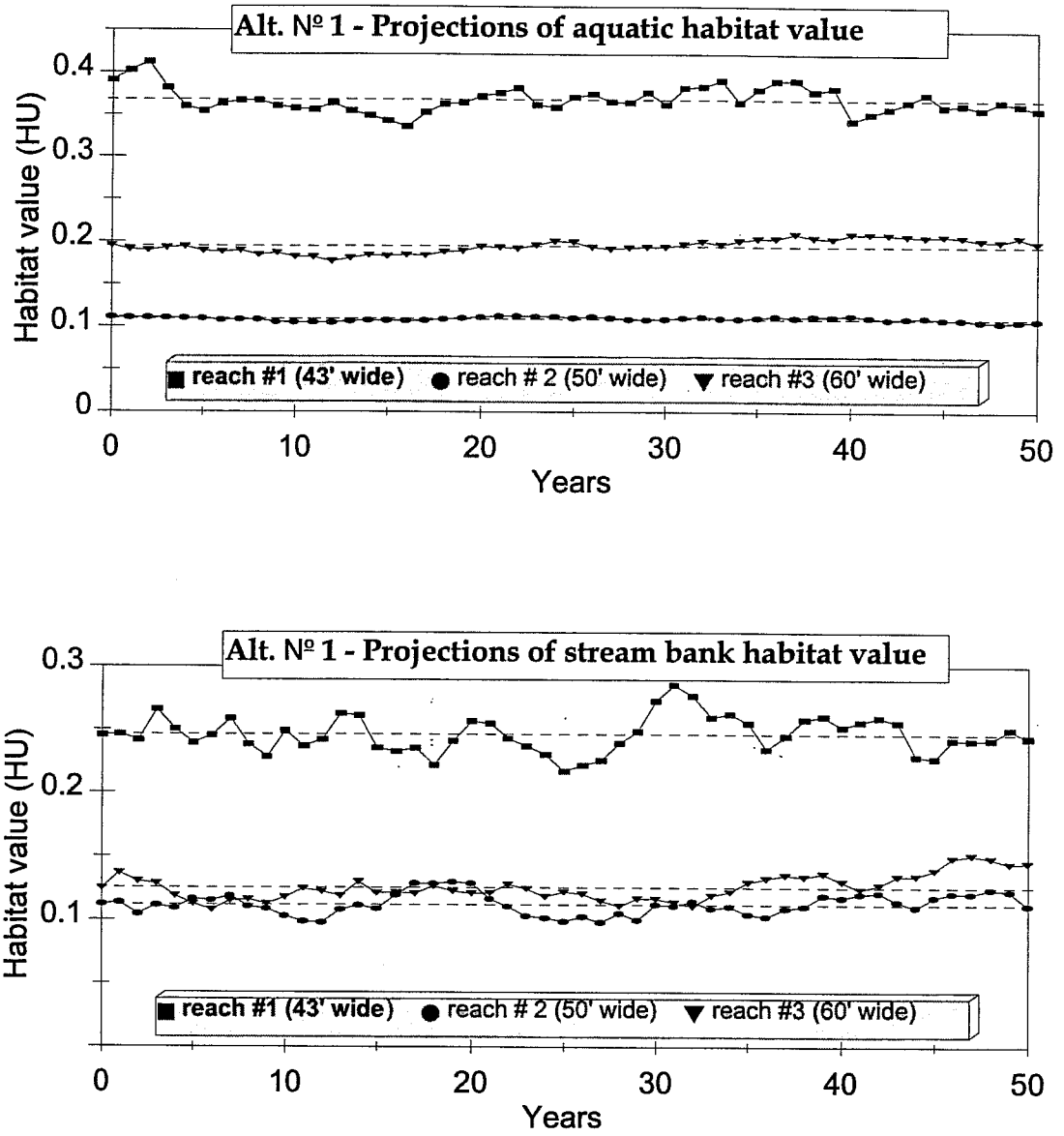



Fig. 10-9. Results of HEP analysis (Appendix C) which describe habitat values expected for the future without project. Aquatic habitat appears in the upper panel, stream bank habitat in the lower, and each panel shows how habitat units (HU) for each reach might change from year to year. Dotted lines are the average habitat value of each reach respectively over the 50 year period.

R **Stream bank habitat**: A similar pattern of fluctuations in stream bank habitat would be expected in the future if no flood control project were implemented. Removal of existing bank vegetation certainly occurs at times, especially when a property owner repairs existing revetments or elects to protect a length of natural stream bank beginning to erode. The largest fluctuations would be expected to occur in reach 1 (lower panel of Fig. 10-9), again where the existing banks are less disturbed compared to the wider reaches downstream. The amount of such clearance cannot be estimated realistically for any specific bank location. In fact, most of that vegetation removed for any purpose would soon reestablish itself, given the nature of this generally coarse and opportunistic growth, so any signs of all but the most recent removal would quickly be hidden by new growth. Indeed, most losses of existing stream bank vegetation would cause temporary effects, and would probably be regarded as negligible.

R During the life time of the proposed project, habitat quality of stream banks in reaches 1, 2, and 3 would average 0.24 HU, 0.11 HU, and 0.12 HU, respectively. Adding the averages for the three reaches gives a net value equal to 0.47 HU. The difference between that expectation and the current value, 0.48 HU, would be altogether insignificant.

R **Endangered species**: The timing of privately financed stabilization at a site on the creek is a matter of speculation, at best. Most likely, individual property owners along reaches 1 and 2 would make such alterations in the dry season of the year simply because the work would be less prone to weather damage. In the estuary, high tides driven by winter storms could conceivably damage existing revetments and repairs to them might be made immediately if regarded as urgent, or possibly later in the summer. Both necessities would have slight potential to affect both listed fish species: steelhead in the rainy season months, and tidewater gobies in the summer or fall.

Established procedures of channel maintenance by the County, if continued, would have no foreseeable impact to either steelhead or tidewater gobies. There would be no adverse consequences and no benefits to these Federally protected species.

Future large storm events of such a level as may require immediate preventative maintenance or repairs along the stream would also probably flush both steelhead and tidewater gobies entirely out of Mission Creek. Emergency maintenance or repair actions by private landowners or the County may conceivably affect steelhead which happen to have re-entered Mission Creek in the storm's aftermath. While a possibility, such an impact to steelhead would occur so infrequently as to be virtually unpredictable, and therefore not reasonably attributable to the No Action Alternative. Tidewater gobies would most likely have been flushed downstream to the lagoon, or beyond, by any storm event that would trigger such need. This species would not likely sustain any impact from emergency maintenance procedures.

R **The Moreton Bay Fig**: The dripline of the tree is about 200 feet from the closest private property, southwest of the tree and on the opposite side of the sandstone channel. Ornamental landscaping and private walls rise a few feet west of the channel's walls. Even if homeowners were to modify the back edges of their property completely, that physical separation and distance would preclude any genuine effect upon the tree. No sizeable vegetation of any kind grows on the left hand bank of the sandstone channel and, hence, could never be subject to periodic grooming by any entity.

R Maintenance by the County to clean sediments and vegetation from the sandstone channel would also occur at a substantial distance from the tree and major elements of its root system. Maintenance requirements for the banks along the sandstone channel would presumably not involve anything more than re-setting sandstone blocks along the existing alignment of its walls.

Adoption of the No Action alternative would cause no impact of any foreseeable kind to the Moreton Bay Fig.

### 10.4.3 **Alternative 12: 3400 CFS Capacity with Oxbow Bypass, Stabilized Sides Using a Predominant Combination of Planted Riprap, Vertical Wall, Habitat Expansion Zones, and Wetland Construction (Recommended Alternative)**:

#### 10.4.3.1 **Impact Analyses**:

R **Aquatic habitat**: Implementation of Alternative 12 would necessitate excavation of the existing streambed in its entirety. During construction all existing physical features which give the creek bed its present character would be erased by removal of hardened surfaces, scour pools at the approach to bridges and where concrete placed in the creek has been undercut, natural sediments, all plants rooted in the streambed, and the instream fauna which cannot leave aquatic environs. These impacts would start near the lower end of the estuary, then progress upstream as work ends in successive portions of the project area. A hiatus of all construction activities in the creek bed would occur during the winter months, December through March, so the shift of impacts upstream would not happen steadily.

The degradation of aquatic habitat due to construction would be exactly equivalent to the existing habitat value of the future without project, namely 0.73 HU. Construction impacts cannot be avoided, but design features inherent in Alternative 12 and mitigation measures to be implemented (developed in §10.4.3.4 and 10.3.4.5, below) would negate these impacts entirely and render them effectively temporary in nature.

R Construction of toe walls, in part to shore up sloped banks where native trees and shrubs would be planted, would also physically and ecologically separate aquatic habitat from stream bank habitat. The HEP evaluation accounts for this impact by assigning lower habitat suitability indices to each individual structural mitigation feature than would otherwise be appropriate for them were this design to be built in a streambed without walls (see Table 10-6 and Appendix H).

Future maintenance of the flood control project will be necessary. In a way analogous to the need for periodic maintenance of the creek given the future without project — namely removal of sediments , obstructive growth of plants in the streambed, and accumulated debris — the project design requires maintenance as well. Unlike Alternative1, the recommended plan would allow as much growth of non-obstructive plants within the streambed as can be accommodated without interfering in achievement of the channel's design capacity. This procedure, termed a "mosaic pattern" of managing plant growth (please consult Appendix H, the Mitigation Monitoring Plan) preserves a portion of the habitat values which would accrue from one year to the next. Sediment removal will become necessary from time to time, as determined by weather patterns and local factors elsewhere in the watershed. Based on historic maintenance needs of the creek this should happen about every third year, on average. For Alternative12, the analysis of effects due to future maintenance assumes all the excess sediments and plants growing in them would be removed from the creek bed upstream from the freeway in those occasional years when the channel has lost at least 15% of its conveyance capacity. A cycle of aquatic habitat quality would mark Alternative12; rising when winter rains have not brought on the need to clean sediments from the channel and plant growth has been steady, but dropping sharply after the channel has been de-silted.

R **Stream bank habitat**: Implementation of Alternative 12 also would necessitate excavation which reaches the outside edge of the project's right of way. The recommended design depends on complete excavation of existing stream banks laterally from the current position of the toe to the limit of the right of way, expansion of the streambed, placement of channel walls, and filling and compaction of soils and similar materials to create the recommended combination of toe walls and vegetated riprap slope (Chapter 5, §A of the Main Report). Alternative 12 would cause temporary impacts associated with construction activities to stream bank habitat, aquatic habitat, and any wildlife present in the immediate area. It would remove virtually all existing vegetation on stream banks. The aggressive pest species, giant reed, castor bean, tree tobacco, and sweet fennel in particular, would thus be removed from the project reach. These impacts would gradually shift upstream as lower sections of bank and channel are completed.

R A portion of the native trees now growing along the banks probably would be removed during bank excavation, depending on detailed construction plans yet to be prepared. This loss would include a sycamore about half way between de la Guerra and Ortega Streets, part or all of the cluster of sycamores (3 trees, or a tree with 3 trunks) growing on the left hand bank upstream of Bath Street bridge, a coast live oak at Ortega Street bridge on the left, and arroyo willows and white alders at scattered locations. In total, between 12 and 15 extant trees have to be removed to accomplish the recommended design.

The degradation of stream bank habitat due to construction would be exactly equivalent to the existing habitat value of the future without project, namely 0.48 HU. Construction impacts of this level cannot be avoided, but design features inherent in Alternative 12 and mitigation

measures to be implemented (developed in §10.4.3.2-4, below) would negate these impacts entirely and render them effectively temporary in nature. Native trees to be planted would substantially offset the unavoidable loss of existing trees.

R **Endangered Species — Steelhead of the southern evolutionary unit:**

**Construction between Cabrillo Boulevard and Yanonali Street.** The most likely potential cause of adverse effects to steelhead will lie in the necessity to dry the streambed and toe of banks prior to construction. The plans for flood control construction would minimize this possibility through a combination of timing the work to give the best match to the life history patterns of steelhead migration, on-site monitoring for and supervised relocation of fish, and means to de-water only half the creek at any one time, thus always allowing steelhead unfettered movement in half the estuary. Nonetheless, netting and moving fish would affect them in a temporary and adverse manner. Please refer to the Mitigation Monitoring Plan for a summary of project related mitigation and monitoring.

**Construction between the oxbow and Canon Perdido Street.** Direct mechanical injury of fish or indirect but adverse effects such as impaired respiration caused by greatly increased turbidity could have impacts to steelhead while construction is underway in these upper waters of the project area. Measures to avoid or minimize unavoidable impacts include scheduling construction work outside the migration period, on-site monitoring for and supervised relocation of young salmonids encountered unexpectedly, temporary barricades at the upstream end of sections under construction to exclude smolt sized fish, or temporary use of a pilot channel through the current construction area screened at its upper end to block smolt-sized fish. Any fish netted and relocated would sustain adverse but temporary effects.

**Routine channel maintenance.** During winter storms, the creek presently scours pools at bridge abutments, e.g. the upstream side of that at Bath Street and that at Highway 101. These pools may persist through the dry season when sufficiently large and sheltered in the shade of the bridge itself. Although an unlikely event, young salmonids who get washed downstream before they are ready to swim to sea and are not yet strong enough to return to waters higher upstream would try to survive in such pools. As a precaution during the annual maintenance cycle, any young trout holding out in such refuges would be subject to supervised relocation. Steelhead netted and moved for their own well being would sustain adverse but temporary effects nonetheless.

R **Endangered Species — Tidewater goby:**

**Construction between Cabrillo Boulevard and Yanonali Street.** The most likely potential cause of adverse effects on tidewater gobies will lie in the necessity to build a temporary construction exclosure to dry the streambed and toe of banks prior to mechanical excavation. The scheme for flood control construction and its tentative scheduling would minimize this effect during the prime goby reproductive season through a combination of timing the work, on-site monitoring for and supervised relocation of fish, and means to de-water only half the creek at any one time. Nonetheless, netting and moving gobies in an approved manner would affect them temporarily and possibly adversely.

Release of tidewater gobies and other animals taken in seines from the drying exclosure into a suitable area, presumably of Mission Creek, may mean dumping assorted species together in quite unnatural densities and groupings of species. Until these refugees have dispersed, an unwitting interspecific melee could lead to gobies being confused and then eaten in numbers higher than would be typical.

Even after the water exclosure has been erected to dry half the creek, gobies would still have access to unrestricted water in the other half of the channel. However, it is conceivable that mechanical vibration originating from earthmoving equipment operating in the dry side of the exclosure could be transmitted through the ground and water. Such vibrations could be sufficiently irritating, or perhaps just sufficiently novel, as to dissuade gobies from swimming upstream past the construction area into higher reaches of the estuary, as they might be accustomed to do. Construction activities in the estuary could restrict their foraging to an area downstream of the vibration and potentially smaller in surface area of the bottom and overall volume than would otherwise be the case. That such a disruption of normal behavior may occur seems plausible. Should this happen, it would constitute an adverse effect on the population, although one of temporary duration.

Construction on the banks would remove what little vegetation now grows along the estuary. To the extent that plant growth provides important sources of food, e.g. aquatic insect larvae which themselves depend on nutrients washing into the estuary, removal of these plants could, perhaps, have a direct effect on the nutrition of gobies within the estuary.

Removal of existing shrubs between State Street and Cabrillo Boulevard may alter the microhabitat and behavior of gobies in this region of the creek. A change of this nature may be construed as having an adverse effect on gobies. The effect would also be temporary.

Design plans would leave the creek's channel wider than it is currently and confined between concrete walls whose surfaces are smoother than the existing spectrum of revetments. These structural changes could induce changes to flowing water, especially in the boundary layer where tidewater gobies might swim preferentially. Such potential changes in lotic characteristics of the creek could affect tidewater gobies adversely.

**Construction between the oxbow and Canon Perdido Street.** As construction during the second year of the project resumes upstream of the oxbow and then shifts steadily upstream from there, silt curtains will be deployed below the immediate area of construction to reduce suspended sediments in the water. In all likelihood, these fences probably will not trap all sediments and some will be carried downstream to the estuary. The distance over which untrapped sediments would have to travel and probably settle out (a minimum of about 1000 feet between the oxbow and Yanonali Street) before ever reaching the estuary should minimize effects on gobies. However, if sediment concentrations are still high by the time water reaches the estuary, gobies there could experience some impairment of respiration. This potential adverse effect should wane as mechanized work advances steadily upstream from the oxbow toward the project's upper limit.

Secondarily, silt fences may also trap potential food items that would otherwise wash downstream and become part of tidewater gobies' diet. A change in movement of organic detritus, also potentially attributable to silt fences located farther upstream, could starve insect larvae or snails which gobies normally feed on, thereby indirectly affecting tidewater gobies. Disruption of the food web in the estuary due to construction upstream which alters the movement of sediment and organic debris downstream may constitute an indirect effect to tidewater gobies in Mission Creek.

**Routine channel maintenance.** Once finished, the project will require annual maintenance to maintain design channel conveyance. Historically, fine sediments have never accumulated in the estuary to a depth which necessitates that they be removed. Larger runoffs during the winter months effectively remove all of the silty deposits which settle there during the summer and fall. Sediment budgets should not change appreciably with the project. As a result, no impact to tidewater gobies is anticipated from periodic maintenance procedures.

Building the recommended design for flood control on Lower Mission Creek probably will entail unavoidable and incidental impacts to both steelhead and tidewater gobies. However, design features inherent in Alternative 12 , mitigation measures and environmental commitments to be implemented (developed in §10.4.3.2-4, below) would result in substantial and permanent improvements of aquatic habitat value compared to the future without project. Mitigations proposed focus on microhabitat benefits for gobies, heterogeneity of stream flow conditions during upstream and downstream migration by steelhead, and overall aquatic habitat value. Effects of these mitigations and environmental commitments would fully offset the level of incidental impacts upon both fish species.

R **The Moreton Bay Fig**: The recommended design involves making an underground culvert to capture a major fraction of stream flow during flood events. The proposed underground bypass would be formed no closer than about 35 yards southwest of the tree's trunk. Following that alignment, a distance of 50 feet would lie between the tree's dripline on its

southwestern side and the edge of the bypass culvert. Small feeder roots very likely extend at least this far from the tree. Major trunks of its root system would not.

Alternative 12 would require construction passing through the tree's peripheral root system. Excavation to build this bypass would come no nearer the tree than about 60 feet beyond its dripline. Any root damage occurring at this distance from the vital parts of the tree would have negligible physiological effect to the tree itself. As a precaution, an arborist knowledgeable about the root systems of large ornamental trees, shall monitor the initial excavation for the box culvert. Any sizable roots severed during trenching shall be treated by trimming ragged ends smoothly and then sealing with a wound sealer for trees.

The box culvert would be constructed downslope from the tree. Neither the trench needed to install it, nor the finished buried culvert itself, would disrupt subsurface movement of water toward the tree's root system. The reinforced box could actually function as a buried sill and cause a small accumulation of soil moisture on the side toward the tree. In consequence, the fig may have a readier source of water toward the southwest during dry times.

No impact of any kind would occur to the Moreton Bay fig as a consequence of implementing the recommended alternative.

R 10.4.3.2 **Beneficial effects to aquatic habitat of inherent design features**

**Hydraulic properties of Alternative 12 in regard to both endangered fish species:** The proposed designs to accommodate runoff equal to 3400 $ft^3$/sec through this region of Mission Creek necessitate structural changes of the creek bed and its banks. In turn, these will bring about hydraulic changes when compared to existing conditions. The effects of structural changes — wider streambed, soft bottom of the streambed upstream from Highway 101 and downstream of Yanonali Street, a uniform gradient of that streambed, lower water velocity at any given discharge, a shift of sedimentary deposition upstream from where bedloads now tend to settle, walls to confine the creek channel and keep the banks in place, and a culvert to bypass the oxbow channel — have been analyzed with appropriate numerical models. The analyses, methods and assumptions, and results of those models may be perused in the other compendium to this EIS/EIR: *Final Hydraulics Documentation*, Appendix B of the Technical Appendices, September 2000. Interpretations of those results appear below in regard to microhabitat requirements of steelhead and gobies, typically as representative cross-sectional evaluations. However, these interpretations are not meant to substitute for those numerical results and the reader's attention is directed to that attachment for all relevant hydraulic information.

**Wider Creek and Channel.** Greater capacity of the streambed would come, in part, through lateral expansion by excavation of existing stream banks. Expansion of the creek's width would not be uniform throughout its length. Instead, different segments would be widened by different amounts (Table 10-1).

| Table 10-1. Larger streambed as a result of flood control design | | | | | | |
|---|---|---|---|---|---|---|
| segments bounded by streets | existing creek bed width (average) | | planned creek bed width | | % increase | |
| | feet | acreage | feet | acreage | feet | acreage |
| Canon Perdido to Haley Streets: (reach 1) | 25 feet | 1.22 acres | 43 feet | 2.10 acres | 75% wider | 72% larger |
| Haley Street to Highway 101 (reach 2) | 25 feet | 0.57 acres | 50 feet* | 1.06 acres | 80 % wider, on average* | 86 % larger, on average* |
| Yanonali Street to Cabrillo Blvd. (reach 3) | 27 feet | 0.69 acres | 60 feet | 1.54 acres | 71% wider | 220% larger |
| streambed habitat | | **2.48 acres** | | **4.70 acres** | | **90% larger** |
| net change | | | | **2.22 acres** | | |

**Natural Bottom**: At present, concrete has been placed on the bottom or along the sides of the creek over at least 33% (1820 linear feet) of the streambed, or as estimated by existing streambed area, on about 20% of that (*ca.* 0.52 acres/2.3 acres = 0.2). Estimates are conservative because more could well be present but unseen because sediments cover it.

All existing hardened bottom would be removed and replaced by native sediments throughout except within the historic sandstone channel and beneath bridges already built as box culverts. In total, approximately 4450 linear feet of streambed would be surfaced with native sediments. Incorporating the three distinct widths of the final design — 43, 50, and 60 feet — the proposed design would yield approximately 4.4 acres of streambed, and all this would be without any hardened surfaces, just soft, native sediments. This would amount to an increase of nearly 2¼ acres (Table 10-1) over the current size.

The native sediments which underlay Mission Creek would become the actual stream bed after all existing hardened surfaces have been removed. Subsequent aggradation of materials derived from the Santa Ynez Mountains, primarily cobbles and coarse gravels, would restore the bottom's native irregular and varied texture. Together with finer sediments lodged among them, invertebrates and herbaceous plants would benefit incidentally.

**Longitudinal Streambed Profile**: The streambed will have a constant pitch when completed, particularly at bridges. No discontinuities in the slope of the creek's channel will occur anywhere within the project, nor at the transition to the trapezoidal section of Mission Creek upstream from Canon Perdido Street (*Final Hydraulics Documentation*, Appendix B of the Technical Appendices, September 2000). In consequence of this design feature, steelhead will not confront drop structures of any kind from either direction.

**Current velocity**: The existing stream channel has considerable topographic variability in addition to being rather narrow on average. The lateral expansion coupled with restoration of soft bottom throughout would have the overall effect of slowing the water at any given discharge. Calculations from appropriate numerical models of the stream channel (*Final Hydraulics Documentation*, Appendix B of the Technical Appendices, September 2000, **HEC-RAS output**) were made at 50 foot intervals of measured stations. Among those, seven representative cross-sections have been selected to represent the general pattern. These seven happen also to be the cross-sections for which sediment deposition budgets were calculated, as well. By location, they are shown in Fig. 10-10.

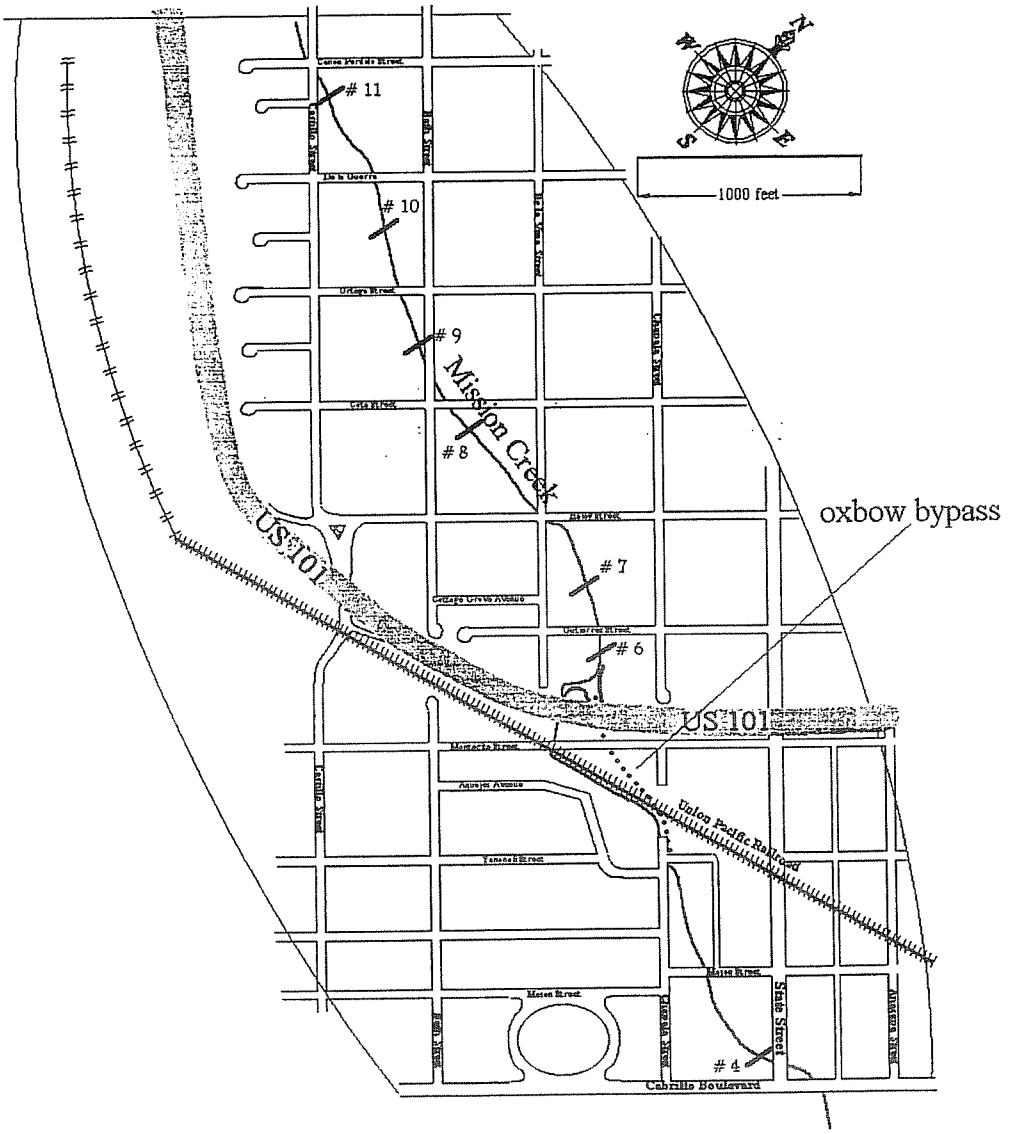



Fig. 10-10. Locations of seven typical cross sections used most currently to model hydraulic properties of the recommended design.

At two cross-sections, one of them in the estuary (4), stream velocity is expected to rise compared to existing patterns (Table 10-2). Water velocity in the center of the channel would double from about 2 to about 4 feet per sec, according to these calculations. At five of them, stream velocities are projected to be lower than the current conditions.

On average, stream velocity at a discharge equal to 640 $ft^3$/sec would by 95% of the current conditions.

Table 10-2. Water velocities as calculated (HEC-RAS model) for seven representative stream cross-sections.

| | Velocity (ft/sec) of Mission Creek when conveying 640 $ft^3$/sec | |
|---|---|---|
| representative cross section | existing channel | proposed wider channel |
| 11 | 4.55 | 6.88 |
| 10 | 8.14 | 6.17 |
| 9 | 5.15 | 3.42 |
| 8 | 10.22 | 4.68 |
| 7 | 5.57 | 4.38 |
| 6 | 9.37 | 4.38 |
| 4 | 1.92 | 3.89 |

**Sediment Budget**: Stream flow data recorded through the period of record (at USGS stream gage station Nº 11119750 on Mission Creek near Mission Street, approximately 1½ miles upstream of the top of the project) were analyzed by appropriate statistical techniques (HEC-1 Flood Hydrograph Package, see Hydraulics attachment) to give valid and comparable models of peak and average daily flows. Such numerical models, called balanced hydrographs, then were applied in conjunction with the specific hydrograph of the record flood (that of January 10, 1995 when peak discharge reached 5200 $ft^3$/sec and the 24 hour average discharge was 1400 $ft^3$/sec) to calculate projected movement of sediments.

Each calculation (Table 10-3) pertains to a single storm event, even though the present and future needs to remove sediments arise from net aggradation from the sporadic patterns of individual storms over a period of time. Projections for sediment movement at seven representative cross-sections (Fig. 10-10) have been derived at three representative levels of discharge. In a harsh year, the sediments from many storms could trigger repeated maintenance