

## **APPENDIX G**

### **SUMMARY**

#### **PURPOSE OF THE ANALYSIS**

Section 404 of the Clean Water Act requires project proponents to obtain a permit from the U.S. Army Corps of Engineers (Corps) for activities that involve placement of dredged or fill material into waters of the United States (33 USC 1344). While the Corps of Engineers does not issue permits to itself under this provision of law, for Corps projects which affect the water of the United States, the Corps nevertheless evaluates its projects as if this permit requirement applied. The Clean Water Act requires the Corps, when considering a project, to follow the requirements of the U.S. Environmental Protection Agency, Specification of Disposal Sites for Dredged or Fill Material, 40 CFR Part 230, Section 404(b)(1). For water-dependent and non-water dependent projects, the Guidelines prohibit discharges of dredged or fill material into waters of the United States if a practicable alternative to the proposed project exists that would have less adverse impacts on the aquatic ecosystem, including wetlands, and does not have other significant environmental consequences (40 Code of Federal Regulations [CFR] 230 [a]). This alternatives analysis for the Upper Guadalupe River Feasibility Study Environmental Impact Report/Environmental Impact Statement (EIR/EIS) and other available data will provide input to facilitate the permitting decision, pursuant to EPA's Guidelines, for the Corps.

#### **DESCRIPTION OF THE PROPOSED PROJECT**

The Guadalupe River Flood Control Project is proposed by the Corps to control flooding along the Guadalupe River within the City of San Jose. The Guadalupe River currently cannot contain either the 50- or 100-year flood. To increase the capacity of the Guadalupe River, channel modifications are proposed along six sections, or reaches, of the Guadalupe River that cover approximately 5.5 miles. Modifications also are proposed on adjacent portions of two tributaries, Canoas Creek and Ross Creek. Channel modifications proposed by the two alternatives, the Bypass Channel plan and the Channel Widening plan, include constructing bypass channels (Bypass Channel plan only), widening the channel, adding benches, lining portions of the channel with gabions and cribwalls, and constructing floodwalls and levees.

#### **RESULTS OF THE ALTERNATIVES ANALYSIS**

The Corps has evaluated several alternative means of achieving flood control on the upper Guadalupe River. Alternatives were explored in terms of economic feasibility, flood control effectiveness, and environmental acceptability per Corps planning guidance. Screening proceeded from the consideration and elimination of general plans that were clearly inferior according to the screening criteria to the detailed consideration of two practicable alternatives, the Bypass Channel plan and the Channel Widening plan, which, along with the no-action alternative, were identified for further evaluation in the Corps' Feasibility Study and EIR/S (this document). The Bypass Channel plan evaluated herein is part of a larger project currently proposed by the Santa Clara Valley Water District (SCVWD). The SCVWD's Draft EIR/S (Parsons Engineering Science 1997) addressing that project is the primary source of information for the analyses contained in this document.

## **Wetland Impacts for the Bypass Channel and Channel Widening Plans**

Field surveys were conducted on April 16 and 22, 1996 to verify the results of a previous field evaluation that identified waters of the U.S. Total jurisdictional waters amount to 38 acres, including 4.85 acres of wetlands and 33.15 acres of other waters of the U.S. Correspondence regarding the wetlands delineation is included in Attachment 1.

The following is a summary of pre-mitigation and post-mitigation impacts on wetlands for the Bypass Channel plan and the Channel Widening plan.

### **Bypass Channel Plan**

**Pre-Mitigation Impacts.** The Bypass Channel plan would result in the permanent removal or temporary disturbance of approximately 0.89 acre of jurisdictional wetlands and 9.93 acres of other waters of the United States. A portion of the impact on the wetlands (not quantified) would be the result of temporary disturbance or minor grading. Narrow strips of seasonal wetland affected in many such areas are expected to reestablish naturally, because natural recovery of seasonal wetland vegetation has been observed on some banks and bars on the lower Guadalupe River. Impacts on portions of the other wetlands (particularly in Reaches 10B, and 12) will be permanent.

Most or all of the impacts on other waters of the United States will be temporary occurring only during construction. Following construction, ordinary high waters will occupy equal or greater areas in every reach and will remain in essentially their original locations (except in the middle of Reach 10B, where the low flow channel will shift slightly eastward).

**Post-Mitigation Impacts.** The Bypass Channel plan would result, with the implementation of mitigation measures, in no net loss of wetlands or other jurisdictional waters of the United States. The Bypass Channel plan would actually create additional wetland habitat beyond that required for mitigation (1.54 acre net increase within the study area [some of this acreage would be used by the SCVWD to mitigate wetland losses caused by their proposed project in adjacent reaches up- and downstream of the study area]). Mitigation for wetlands and other jurisdictional waters of the United States includes the following measures:

- Establish at least 0.89 acre of constructed jurisdictional wetlands to provide no net loss of wetlands within the project area, including construction of new wetlands in Reaches 10B and 12.
- Restore as much as possible of the temporarily disturbed wetlands on-site.
- Use native plant species such as grasses, sedges (*Carex* spp.), and water-plantain (*Alisma* spp.), that are flexible enough to be minimally disturbed by channel maintenance activities and minimize obstruction of flood flows.
- Use jurisdictional wetland delineation criteria as a basis for success criteria for constructed wetlands.
- Provide at least 9.93 acres of constructed and restored other waters (at least a 1:1 replacement ratio) to compensate for other waters that are either disturbed or eliminated during project construction.

### **Channel Widening Plan**

**Pre-Mitigation Impacts.** The Channel Widening plan would result in the permanent removal or temporary disturbance of approximately 0.28 acre of jurisdictional wetlands and 2.64 acres of other waters of the United States. A portion of the wetland impact (not quantified) would be the result of temporary disturbance or minor grading. Narrow strips of seasonal wetland affected in many such areas are expected to reestablish naturally, because natural recovery of seasonal wetland vegetation has been observed on some banks and bars on the lower Guadalupe River.

**Post-Mitigation Impacts.** Reliable acreage figures for the increase in wetlands and waters of the U.S. under the Channel Widening plan are not available due to the difficulty in determining which portions of the low bench constructed under

that plan would become wetlands or waters of the U.S. Mitigation measures for the Channel Widening plan parallel those described previously with regard to ensuring no net loss of jurisdictional wetlands and waters of the U.S.

## **CHAPTER 1. INTRODUCTION**

### **PURPOSE OF THE ANALYSIS**

Section 404 of the Clean Water Act requires project proponents to obtain a permit from the U.S. Army Corps of Engineers (Corps) for activities that involve placement of dredged or fill material into waters of the United States (33 USC 1344). While the Corps of Engineers does not issue permits to itself under this provision of law, for Corps projects which affect the water of the United States, the Corps nevertheless evaluates its projects as if this permit requirement applied. The Clean Water Act requires the Corps, when considering a project, to follow the requirements of the U.S. Environmental Protection Agency, Specification of Disposal Sites for Dredged or Fill Material, 40 CFR Part 230, Section 404(b)(1). For water-dependent and non-water dependent projects, the Guidelines prohibit discharges of dredged or fill material into waters of the United States if a practicable alternative to the proposed project exists that would have less adverse impacts on the aquatic ecosystem, including wetlands, and does not have other significant environmental consequences (40 CFR 230 [a]).

Before approving a project, the Corps requires it be shown that there are no practicable, less damaging alternatives. The purpose of this report is to provide the Corps and EPA with information regarding the availability of practicable alternatives to the proposed project that are not analyzed in detail in the EIR/EIS and to summarize the analysis contained in the EIR/EIS regarding those alternatives that may be considered practicable after preliminary stages of screening. The Corps is responsible for making the formal determination of compliance with the 404 (b)(1) Guidelines. This alternatives analysis for the Upper Guadalupe River Feasibility Study EIR/EIS and other available data will provide input to facilitate the permitting decision of the Corps.

### **SECTION 404 (B)(1) GUIDELINES**

EPA's Guidelines (40 CFR 230 et seq.), the Corps regulatory guidelines (33 CFR 320 et seq.), and the National Environmental Policy Act (NEPA) and NEPA Guidelines (40 CFR 1500 et seq.) are the substantive environmental criteria used by the Corps to evaluate permit applications. When the Corps evaluates a request for a permit, an analysis of practicable alternatives is the primary screening mechanism used to determine the appropriateness of permitting a discharge. The Corps' evaluation also includes a public interest review and a review for NEPA compliance.

Under EPA's Guidelines, an alternative is considered practicable if it is "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the project purpose" (40 CFR 230.10 [a][2]).

If a project is not water dependent (i.e., does not require access to or siting in special aquatic sites to fulfill the basic purpose) and the project proposes a discharge into a special aquatic site, EPA's Guidelines presume that a less environmentally damaging practicable alternative exists, unless the project applicant can clearly demonstrate otherwise (40 CFR 230.10 [a][2]). Special aquatic sites include sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes. Thus, if a project is not water dependent and proposes to discharge dredged or fill material into a special aquatic site, the project applicant must clearly refute the regulatory presumption that a less environmentally damaging practicable alternative exists to obtain a permit for the project.

EPA's Guidelines suggest a sequential approach to project planning in which mitigation measures are considered only after the project applicant shows that no practicable alternative is available to achieve the basic purpose with less environmental impact. After it has been determined that no practicable alternative is available, EPA's Guidelines require that appropriate and practicable steps be taken to minimize potential adverse impacts on the aquatic ecosystem (40 CFR 230.10 [d]). Such steps may include actions controlling discharge location; material to be discharged, or fate of material after discharge or method of dispersion; and actions related to technology, plant and animal populations, or human use (40 CFR 230.70-230.77).

## **CHAPTER 2. PURPOSE OF AND NEED FOR PROJECT**

### **PROJECT PURPOSE AND NEED**

The objective of the Feasibility Study is to identify a feasible project providing flood protection along the upper Guadalupe River while fulfilling federal interest requirements and meeting the needs of the non-federal sponsor (SCVWD).

### **PUBLIC NEED FOR FLOOD CONTROL**

A one percent or 100-year flood is the largest flood normally considered in flood control planning. Along the upper Guadalupe River, such a flood could cause the inundation of approximately 7,200 residential units, six public schools, 340 acres of commercial and industrial properties, and 114 acres of agricultural land located near the river and portions of two tributaries, Ross Creek and Canoas Creek. The Bypass Channel plan would contain the 100-year flood, preventing these damages and also substantially reducing the need for mandatory flood insurance that currently is required for areas prone to flooding during a one percent flood. A two-percent or 50-year flood would cause somewhat lesser, but still substantial damages. The Channel Widening plan would contain the 50-year flood.

Severe flooding occurred in Santa Clara County as a result of storms in January 1995. On January 9, 1995, the amount of rainfall recorded in the County ranged from 1 to 4.55 inches in 24 hours. The rainfall intensities in January were up to a 5% (20-year) return period (i.e., a flood of this magnitude has a statistical change of occurring once in every 20 years). The mayor of the City of San Jose declared a state of emergency, and the President of the United States declared Santa Clara County a federal disaster area. Estimated flood damage was \$2.2 million for the County, with more than 150 homes damaged by flooding or downed trees. During this storm, mudslides and torrents of rain resulted in the closure of sections of several major highways, including SR 87, and forced evacuation of the area. Among the hardest hit areas were those flooded by the Guadalupe River.

The Guadalupe River spilled over its banks on the night of January 9, 1995, at three locations in central San Jose. During this storm, water depth in some areas reached 15 feet. The Guadalupe River forced its way into homes and pushed 50 feet along sidewalks. Water was overtopping banks, seeping through embankments, and cascading onto the roadway that had become a flood channel. Approximately 25 acre-feet (8 million gallons) of water inundated SR 87, resulting in the closure of the southbound lanes of the highway for two days and the northbound lanes for three days.

Flooding also occurred during storms in March 1995. On March 10, the Guadalupe River and Los Gatos Creek combined to produce the highest flow on record. The flow rate in March was estimated at 10,500 cubic feet per second (cfs), with a 25-year return period. Because streets were flooded, residents and workers in office buildings were forced to evacuate. Between 200 and 300 houses and buildings were flooded from four separate breakouts along the Guadalupe River. The mayor of the City of San Jose declared a state of emergency on March 10, 1995. On March 13, 1995, the President of the United States declared a state of national emergency. SR 87 was closed for the second time in two months. Preliminary damage estimates exceeded \$5 million.

## CHAPTER 3. GENERAL METHODOLOGY OF ALTERNATIVES ANALYSIS

### INTRODUCTION

The Section 404(b)(1) Guidelines are the substantive criteria used in evaluating projects that would discharge dredged or fill material into waters of the U.S. Review for conformance with the Guidelines is an essential component of the Corps' project evaluation. The objective of the alternatives analysis is to identify practicable alternatives that meet the basic project purpose and also to describe the environmental impacts associated with each practicable alternative. The Corps' process, referred to as Plan Formulation, is summarized in Chapter 2 of this EIS/R and in more detail in the Draft Report on the Feasibility Study (COE 1998).

### ALTERNATIVES ANALYSIS

General categories of flood damage prevention measures were analyzed to determine whether they met the project objectives. If project objectives for flood control were met, a category would be explored further to assess whether it was practicable and would result in fewer adverse environmental impacts. The general categories analyzed included both structural and nonstructural measures, among them the following (COE 1998):

- Construct New Upstream Reservoir(s)
- Modify Existing Reservoirs
- Channelization
- Bypass Channel
- Levees
- Floodwalls
- Channel Clearing
- Floodplain Regulation
- Relocation of Existing Structures in the Floodplain
- Flood Warning System

Individual flood reduction measures in these categories were combined to provide preliminary alternative plans for the study area (COE 1998).

### Screening Criteria

The screening criteria used were economic feasibility, flood control effectiveness, and environmental acceptability, as per Corps planning guidance. Alternatives that clearly did not meet the screening criteria were eliminated from consideration whereas those that did were refined and subject to more detailed cost, engineering, and environmental analyses. As a result of this process, two feasible alternatives, the Bypass Channel plan, providing 100-year flood protection, and the Channel Widening plan, providing 50-year flood protection were identified and, along with a No-Action alternative, subject to detailed analysis in the Feasibility Study EIR/S (this document). The Bypass Channel plan is a subset of the SCVWD's preferred plan for flood control on the upper Guadalupe River, which is evaluated in a separate EIR/S (Parsons Engineering Science 1997).

## CHAPTER 4. SCREENING EVALUATION RESULTS

### FORMULATION OF CONCEPTUAL ALTERNATIVE PLANS

The consideration of general plans early in the study process is summarized in Chapter 2 of this document and described in more detail in the Feasibility Study Draft Report (COE 1998). Measures considered but rejected, and reasons for their rejection, are as follows:

#### Nonstructural Measures

*Flood Forecast, Warning and Evacuation.* This measure was rejected because of the difficulty in predicting floods and the uncertain success of evacuation. Due to the nature of the watershed, floods can be expected to happen too quickly for this measure to be effective.

*Temporary or Permanent Closures of Structure Openings.* This measure would not have adequately protected the wood-frame structures that would be inundated during floods.

*Raising Existing Structures.* This measure was eliminated due to the costs associated with raising a large number of structures in the floodplain.

*Small Walls and Levees Around Existing Structures.* This alternative was determined to be economically infeasible.

*Rearranging or Protecting Damageable Property Within a Structure (Floodproofing).* This alternative was eliminated because the costs of relocating property to less accessible areas were too high.

*Purchase or Removal of Existing Structures and/or Contents from the Floodplain.* This measure was eliminated because, if implemented for the floodplain as a whole, it would have been socially disruptive, causing losses of tax revenues, and not alleviating residual impacts to remaining infrastructure and buildings that would still have to be cleaned up following floods.

#### Structural Measures

*Upstream Reservoirs.* Consideration was given to constructing new upstream reservoirs on Guadalupe Creek and Alamitos Creek. This approach was rejected as being too costly and having unacceptable environmental impacts.

*Offstream Storage.* An offstream storage pond was considered but rejected because of the high cost of land and the limited effectiveness of such a pond in reducing peak flows.

*Channel Modification.* The costs and benefits associated with several alternative types of channel modification have been considered (see Chapter 2.2 of this document; COE 1998). Among the alternatives rejected because of costs and/or environmental impacts were a concrete covered bypass channel; full channelization of the river; and the construction of floodwalls or levees the full length of the river.

Additional discussion of alternative plans incorporating the above measures that were considered and rejected is provided in Jones & Stokes (1996).

#### Formulation of Candidate Plans

The formulation of alternative candidate plans proceeds by identifying “breakout” areas where channel capacity is limited; and by formulating the least costly measures of protection that are socially and environmentally acceptable (Chapter 2.3 of this document; COE 1998). Measures providing a specified level of protection are then combined into comprehensive plans, which are subject to cost-benefit and environmental analyses (COE 1998). This process resulted in two structural plans, the Channel Widening plan and the Bypass Channel plan, along with the No-Action alternative, being carried forward for detailed analysis in the Feasibility Study.

## **Project Descriptions**

### *No-Project Alternative*

Under the No-Project Alternative, the District would not take any direct action to reduce the flood hazard from Guadalupe River. Residents and businesses within the floodplain would continue to face potential hardships as a result of flooding. Private properties immediately adjacent to the Guadalupe River and its tributaries would continue to be at risk from streambank failure and blockage by debris. In the event of the one percent flood, approximately 2,200 acres would be inundated. Over 7,200 homes, 230 businesses, 11 public buildings, and 1,390 automobiles would be inundated by floodwaters from the Guadalupe River.

### **Channel Widening Plan Alternative**

The Channel Widening plan incorporates a widened channel—primarily along the east bank only, and the installation of low floodwalls at strategic locations along the river and along Ross Creek, providing protection against an approximate 50-year flood. Levees on Canoas Creek would be raised to a 20-year level of protection. Section 2.4.1 of this document provides a reach-by-reach description of this alternative.

### **Bypass Channel Plan Alternative**

The Bypass Channel plan incorporates a bypass channel, channel widening, levee and floodwalls designed to contain a 100-year flood along the upper Guadalupe River and Ross Creek. Levees on Canoas Creek would be improved to a 20-year level of protection. A reach-by-reach description of the Bypass Channel plan is provided in Section 2.4.2 of this document (see also COE 1998; Parsons Engineering Science 1997).

## SCREENING RESULTS

The following table presents the results of the Draft EIR/S evaluation of the Channel Widening plan, Bypass Channel plan, and No-Action alternative.

Alternative	Meets Purpose & Need?	Feasible & Available?	Environmental Impacts	Jurisdictional Constraints
Channel Widening	Partially: only provides 50-year flood protection	Yes	<p>Removal of 6.49 acres of riparian forest; excavation or filling of 0.28 acre of wetlands and 2.64 acres of other section 404 jurisdictional waters; loss of SRA cover through removal of 4,034 linear feet of overwater vegetation and 2,535 feet of undercut banks.</p> <p>Proposed mitigation would eventually result in 12.10 acres of new riparian forest habitat, fully compensating for the initial removal. Wetlands may reestablish naturally; if not, sufficient acreage would be re-created within the channel. Impacts on other jurisdictional waters would be temporary and minimized through Stormwater Pollution Prevention Plan; no net losses would occur. Initial losses of undercut banks would be reduced where possible; undercut banks would reestablish naturally over time in impacted areas. Overwater vegetation would be reestablished through mitigation plantings on benches created by this alternative.</p>	None
Bypass Channel	Yes	Yes	<p>Removal of 9.08 acres of riparian forest; excavation or filling of 0.89 acre of wetlands and 9.93 acres of other section 404 jurisdictional waters; loss of SRA cover through removal of 4,958 linear feet of over-water vegetation and 1,100 linear feet of undercut banks.</p> <p>Proposed mitigation would eventually result in 21.16 acres of new riparian forest and 2.42 acres of wetland habitat, fully compensating for the initial impacts. Impacts on other jurisdictional waters would be temporary and minimized through Stormwater Pollution Prevention Plan; no net losses would occur. Proposed mitigation for impacts on SRA cover in combination with measures to enhance fisheries habitat would compensate for SRA cover impacts over time.</p>	None
No Action	No	Yes	No change in existing conditions. Periodic flood damage would continue to occur.	None

## **CHAPTER 5. FINAL SCREENING EVALUATION RESULTS**

No comments on this preliminary 404(b)(1) analysis were received during review of the Public Draft EIR/S. The Corps will continue the evaluation of project alternatives, and will consider relevant agency and public input, as part of the 404 permit review process.

Because of the fact that it provides only a 50-year level of flood protection, the Channel Widening Plan does not fully achieve the purpose and need for the project, which is to provide economic benefits associated with flood protection. These benefits are substantially greater for 100-year than 50-year protection. Although the Bypass Channel Plan's adverse impacts are greater in magnitude than those of the Channel Widening Plan, the Bypass Channel Plan provides greater mitigation acreage to compensate for these impacts, and would likely result in greater overall net benefits to the ecosystem. As a result, the preliminary conclusion is that the Bypass Channel Plan, with mitigations identified in the EIR/S, would be the least damaging practicable alternative means of achieving the project purpose and need for flood protection.

