4.3 WATER RESOURCES (FLOODING, WATER QUALITY)

4.3.1 Regulatory Setting

Clean Water Act of 1972

The Clean Water Act (CWA) was established to restore and maintain the chemical, physical, and biological integrity of the nation's waters. One of the most significant federal statutes affecting both surface water and groundwater quality is that portion of the CWA that established the National Pollutant Discharge Elimination System (NPDES) permitting program. The NPDES requirements, as set forth in Section 402 of PL 92-500 (as amended), are designed to regulate point source discharges into waters of the United States. This program is implemented by the State Water Resources Control Board (SWRCB) in the State of California through the Regional Water Quality Control Boards (RWQCBs). Compliance with NPDES regulations will be required as part of the proposed project. Specifically, an NPDES permit will be required for project construction. Additionally, Section 404 authorizes the Corps to issue permits for and regulate the discharge of dredge or fill material into waters of the United States, which would include the Guadalupe River.

State and Regional Water Quality Control Plans

Under provisions of the state Porter-Cologne Water Quality Control Act and the CWA, the San Francisco Bay RWQCB (as a regional office of the SWRCB), regulates water quality in the San Francisco Bay region, which includes the project area. The regional boards are authorized to monitor surface and groundwater quality and to require permits for the discharge of wastewater to all navigable waters.

The SWRCB adopted statewide water quality control plans for Inland Surface Waters and Enclosed Bays and Estuaries in April 1991 (SWRCB 1991). The plans include guidelines for pollutants for which EPA or the state have developed criteria and that can reasonably be expected to impact beneficial uses. For each pollutant, numerical water quality objectives based on EPA 304(a) criteria are established for the protection of human health or aquatic life. Acute and chronic toxicity objectives and narrative objectives are also established. These plans supplement the Basin Plan for the San Francisco RWQCB region.

The Rivers and Harbors Act

The Rivers and Harbors Act was enacted by Congress in 1899 to protect interstate commerce in navigable waters through the regulation of streams and rivers. Sections 9 and 10 of the Act related to protecting navigable waters. Section 9 requires an applicant to obtain a permit to construct a dike or dam in navigable waters of the United States. Under Section 10, the Corps regulates projects or construction of structures in or over any navigable waters of the United States, including the excavation from or deposition of material in any such waters. The Corps' navigable water jurisdiction of the Guadalupe River extends upstream beyond the feasibility study area.

4.3.2 Existing Conditions

Rainfall

In the Santa Clara Valley, 90 percent of the normal annual rainfall occurs in the 6-month period from November through April, with January having the highest average monthly rainfall. Annual precipitation in the Guadalupe River basin averages about 26 inches per year and varies from less than 14 inches near the San Francisco Bay to over 50 inches in the headwaters area of the Santa Cruz Mountains. Table 4.3-1 shows rainfall amounts from recorded and statistical events at rain gauge station throughout the feasibility study area vicinity. Rainfall in the higher elevations of the drainage basin is often considerably greater. On January 31, 1963, the one-day rainfall recorded at the Millberry station, a privately operated facility, at elevation 1,841 feet was 10.25 inches. Because the station is privately managed, the reliability of the record is uncertain.

Surface Water Hydrology

Water Resources

The Guadalupe River drainage basin covers approximately 170 square miles at elevations ranging from 0 to 3,790 feet above sea level (NGVD datum). The headwater tributaries to the main river include Guadalupe, Calero, and Alamitos Creeks (see Figure 4.3-1). The Guadalupe River channel begins at the confluence of Guadalupe and Alamitos Creeks and flows northward approximately 14 miles through heavily urbanized portions of Santa Clara County, eventually discharging into the San Francisco Bay. Ross and Canoas Creeks are two tributary streams that enter the river within the project study area. A third tributary, Los Gatos Creek, enters the river downstream of the project study area. Information pertaining to the drainage area, tributaries, and reservoir storage of the Guadalupe River watershed is provided in Table 4.3-1.

Table 4.3-1. Drainage Area Data for the Guadalupe River

Stream Name	*Drainage Area (square miles)*	*Reservoir Name*	*Storage Capacity (acre-feet)*
Guadalupe River	170	Calero Reservoir	10,050
Guadalupe River south of I-280	95	Almaden Reservoir	1,780
Canoas Creek	19	Guadalupe Reservoir	3,740
Ross Creek	10	Lake Elsman	6,280
Alamitos Creek	38	Lexington Reservoir	20,250
Guadalupe Creek	15	Vasona Reservoir	400
Los Gatos Creek	55		

Source: COE 1977; Parsons Engineering Science 1997

Notes: The Guadalupe River drainage ends at Alviso Slough at San Francisco Bay.
The upper Guadalupe River drainage ends at I-280.
Calero, Almaden, and Guadalupe Reservoirs discharge to the upper Guadalupe River.
Elsman, Lexington, and Vasona Reservoirs discharge to Los Gatos Creek, below the study area.

The SCVWD operates five reservoirs in the drainage basin: Calero, Almaden, Guadalupe, Lexington, and Vasona reservoirs (see Figure 4.3-1). Lake Elsman is privately operated by the San Jose Water Company. The Calero, Almaden, and Guadalupe reservoirs are in the headwater streams to the upper Guadalupe River, while Lake Elsman and Lexington and Vasona reservoirs are along Los Gatos Creek. These reservoirs are operated for water supply storage and groundwater recharge purposes. None are used for flood control purposes, although they can provide incidental flood control benefits.

In addition to collecting surface runoff, Calero Reservoir is also the terminal storage reservoir for water that is imported into the drainage basin from the San Luis Project.

Figure 4.3-1 Guadalupe River Watershed and 100-Year Flood Event

Active erosion and sedimentation are continual problems due to unstable banks along the river and the natural tendency of water courses to change course over time. These conditions can result in bank failures and debris blockages, with a related increased potential for flooding. Erosion can also increase the risk of damage to structures located adjacent to the river banks. Bank erosion along the Guadalupe River is attributed to high flow velocities that scour and cut away at the banks. The most severe erosion problems are within Reaches 7 through 9, from Willow Street to Curtner Avenue, with much of the sediment load washing downstream and being deposited in the reach between I-880 and U.S. 101, downstream of the study area. Sediment deposition also occurs within Reach 12 due to the accumulation of sediments generated from upstream sources. The average annual sediment yield from the upstream portion of the Guadalupe River basin to the study area has been estimated at about 1,600 tons per year per square mile of watershed.

Sediment transport modeling of the upper Guadalupe River (PWA 1996) concluded that dams upstream of the study area and urbanization within the watershed have both significantly reduced the natural runoff sediment load of the upper Guadalupe River. The model indicated that the reaches upstream experience very little river bed elevation changes, while the lower reaches of the study area experience some slight scour during flooding. This would support the conclusion that the river is relatively sediment-starved, despite occasional and localized sediment deposition in the study area.

Direct storm runoff in the drainage basin is extremely variable and has been modified by the construction of reservoirs and diversions as well as development in the drainage basin. An estimate of the average annual runoff between 1931 and 1960 was 35,500 acre-feet, based on data from the U.S. Geologic Survey (USGS) gauging station near downtown San Jose. The wettest recorded year occurred in 1938 when 123,000 acre-feet of runoff was measured.

Discharges under various frequencies for five locations within the project study area are provided in Table 4.3-2. The 100-year discharge calculated for the Guadalupe River channel ranges between 11,400 and 14,600 cfs within the study area. Under existing conditions, the river does not have the capacity to convey even moderate flood flows without the occurrence of flooding in the downstream reaches. Some areas of the river cannot hold a 10-year discharge.

Table 4.3-2. Design Discharges for the Upper Guadalupe River Feasibility Study

	Discharge (cfs)				
Location	*10-Year*	*20-Year*	*50-Year*	*100-Year*	*500-Year*
Guadalupe River upstream of Ross Creek	3,800	6,300	9,100	11,400	17,800
Guadalupe River upstream of Canoas Creek	4,600	7,300	9,700	12,400	19,000
Guadalupe River downstream of Canoas Creek	6,500	9,000	11,200	14,600	21,800
Canoas Creek at Guadalupe River	2,000	2,500	3,000	3,300	3,600
Ross Creek at Guadalupe River	—	1,550	1,950	2,350	3,100

Source: COE 1989; COE 1993; Parsons Engineering Science 1997.
cfs = cubic feet per second.

Flooding

Flood control projects have been fairly extensive on the Guadalupe River, but insufficient within the project study area to contain many flood events. In the river segment from San Francisco Bay upstream to I-280, the Corps and SCVWD have constructed, or are in the process of completing, three separate flood control projects to improve the river channel capacity to carry a 100-year flood discharge and to raise the levees in order to meet the freeboard standards (i.e., distance between the water surface and the top of the levee) for the flood insurance program of the Federal Emergency Management Agency (FEMA).

The Guadalupe River causes downstream flows in tributary creeks to back up (a "backwater effect"). In the case of Ross Creek, water from the river can actually flow up the creek for a short distance (a "backflow effect"). The banks of Ross Creek are low compared to the Guadalupe River, so during a 100-year flood, backflow would occur in Ross Creek. Backflow is also expected to occur on Canoas Creek during the 100-year flood, worsening flooding effects.

During a 20-year flood event (i.e., having a 5 percent chance of occurring in a given year), floodwaters overflow from the west bank of the river in Reach 8, between the Western Pacific Railroad and Willow Glen Way, then flow downstream toward I-280. Floodwaters also overflow the east bank in Reach 7, downstream of the Union Pacific Railroad, and flow downstream between the river channel and Highway 87 before reentering the channel at Virginia Avenue. Backwater effects cause Ross and Canoas creeks to overflow their banks and flood local streets. Flooding from Ross and Canoas creeks flows north and rejoins the river in Reaches 6 and 7.

The 50-year floodwaters (i.e., a flood event having a 2 percent chance of occurring in a given year) overflow from the east bank in Reach 7, downstream of Alma Avenue, and flow toward I-280. Floodwaters also overflow from the west bank in Reaches 7 and 8, at Willow Street and between the Union Pacific Railroad and Willow Glen Way, then flow downstream to I-280. Additionally, bank overflow occurs immediately upstream of Branham Lane. Backwater effects cause Ross Creek to flood with overflows from the north bank flowing through the floodplain toward I-280. Canoas Creek also overflows its north bank and inundates subdivisions from Blue Jay Road to Almaden Expressway and Highway 87. The estimated flooded area resulting from a 50-year event is depicted in Figure 4.3-2.

During the 100-year flood event (i.e., having a 1 percent chance of occurring in a given year), the floodplain inundates an area approximately 2,310 acres in size. The area flooded during a 100-year event is depicted in Figure 4.3-1. A more detailed view of a 100-year flood event of Reaches 7 through 12 is depicted in Figure 4.3-3. By comparison with the 50-year flood (see Figure 4.3-2), the area of inundation is slightly greater for most areas affected, with much more flooding occurring in the southeastern portion of the study area. The 500-year floodplain is similar to the 100-year floodplain, but with a greater area of inundation, covering approximately 2,960 acres. Under these conditions, floodwaters overflow the east bank in Reach 7, downstream of Alma Avenue, as well as in Reaches 11 and 12, around Branham Lane. Overflow of the east and west banks also occurs in Reaches 7 and 8 as it does under the 50-year flood event. Both Canoas and Ross creeks overflow both their north and south banks, although the north bank overflows are more important, especially for Ross Creek. These floodwaters flow through the floodplain toward I-280.

Fig 4.3-2 Upper Guadalupe River 50-Year Floodplain

Fig 4.3-3 Upper Guadalupe River 100-Year Floodplain

Water Quality

Water quality data for the Guadalupe River are collected by the USGS at the closest sampling station to the project area, located approximately 100 feet north of the confluence with Los Gatos Creek. Additionally, the SCVWD recently performed a study as part of their Nonpoint Source Pollution Control Program to estimate the annual loads of metals and organics to San Francisco Bay by watershed within the Santa Clara Valley. The study showed that the Guadalupe River watershed contributes an estimated 30 to 40 percent of the pollutant loads discharged to the Bay from Santa Clara County. Data from the study are presented in Appendix H, Table H-1. USGS sampling of water quality parameters includes dissolved oxygen (DO), turbidity, and pH, as well as concentration of trace inorganics such as metals. A sampling of historical USGS water quality data for the time period ranging from 1949 to the present is also presented in Appendix H, Table H-2.

Recent data indicate that the river water is nearly saturated with DO, pH of the water is slightly alkaline, and the water is very hard (i.e., high calcium carbonate concentration). Turbidity in the river water (measured in Nephelometric Turbidity Units [NTUs]) is highly variable, increasing greatly during the winter months. Active erosion sites are present along the river channel and erosion occurs throughout the project area, which accounts for the increased turbidity during the rainy season. Water quality data show some evidence of metals and other trace pollutants. Organic and inorganic contaminant concentrations present in the river can come from a variety of sources within the watershed including agricultural production upstream, commercial and industrial activities (e.g., leaking underground storage tanks, spills, other discharges, etc.), land development, urban runoff, and transportation activities. The solubility and transport of these constituents vary with river flow and seasonal conditions. As part of the SCVWD NPS Program, a survey was conducted of the Guadalupe River watershed to identify any unauthorized outfalls to the river and its tributaries that may be contributing to the total pollutant load in the river. Tables H-3 and H-4 list the permitted and unpermitted outfalls to the Guadalupe River identified, respectively. Table H-5 lists the outfalls identified for Ross and Canoas Creeks. The unpermitted outfalls identified are the subject of current investigations by the SCVWD (Parsons Engineering Science 1997).

Water quality of the river may also be affected by groundwater discharges. Under high groundwater conditions, groundwater flow may be directed toward the river and may transport chemicals from nearby hazardous waste sites. Some of these are currently being investigated and/or remediated and others have not yet been documented. Refer to section 4.11 for further discussion of this issue.

Groundwater

The Santa Clara Valley is a structural trough that is filled by unconsolidated alluvial fill deposits. These deposits are water-bearing and constitute a major groundwater basin. The water-bearing deposits consist of sand and gravel (the aquifers) and silt and clays (the aquitards, beds that are impediments to ground water flow). In the project study area, groundwater is generally encountered between 20 and 60 feet below the surface in unconfined aquifers or as a perched water table. In areas immediately adjacent to the Guadalupe River, the groundwater gradient historically sloped toward the river but decades of regional groundwater pumping has contributed to groundwater levels falling below the base of the river channel. Perched zones above the base of the river channel still provide some seepage into the river, even in drought conditions, but now that the main water table is below the base of the channel, the flow is predominantly away from the river.

The SCVWD has historically operated the Guadalupe and Los Gatos recharge systems within the Guadalupe River watershed to augment the groundwater supply and to reduce the threat of land subsidence caused by excessive groundwater pumping. The in-stream percolation ponds in Reach 12 were operated for many years. They have not been operated in the last two years as a permit was not obtained from the California Department of Fish and Game. The SCVWD expects to resume operation of these ponds for percolation purposes in the future. When operational, water is released during the dry season, from the various reservoirs in the Guadalupe River watershed, and the recharge systems facilitate percolation of water into the groundwater basin. Offstream recharge occurs at percolation ponds that are fed by water diverted from the creeks or by imported water pipelines and seasonal instream percolation occurs along both Guadalupe River and Los Gatos Creek. The SCVWD's artificial recharge program is carried out within the unconfined forebay of the basin which extends from the basin boundary at the foothills downstream to about Willow Street. Downstream of Willow Street, the recharge would only benefit the uppermost aquifer.

4.3.3 Environmental Effects

Impact Significance Criteria

Criteria used for determining significant impacts on water resources (flooding, water quality, and groundwater) are based on the extent the project would affect the local hydrologic environment and the resulting changes to local biota, land uses, residences and other development. Impacts on water resources are considered significant if an alternative would:

- Result in an increase in size of the 100-year floodplain in the project area, thereby increasing effects on residential and commercial developments;
- Result in degradation of surface or groundwater quality to a point of exceeding state water quality standards or objectives (e.g., RWQCB Basin Plan Objectives and state maximum contaminant levels, where applicable); or
- Violate laws and/or regulations adopted to protect or manage the water resource system in the project area.

Channel Widening Plan

Flooding

The Channel Widening Plan would provide a beneficial effect on the hydrology of the upper Guadalupe River by reducing the existing flood hazard. This beneficial effect would provide the channel with a higher capacity to contain flood flows than presently exists. The level of protection provided by the Channel Widening Plan would accommodate flows up to the size of an approximate 50-year flood. The area subject to flooding with implementation of the Channel Widening Plan is depicted in Figure 4.3-4. This includes flooded areas that would be expected following 50-year, 100-year, and 500-year flood events, respectively. The primary difference between the 50- and 100-year flood event is the area of inundation expected west of the river due to the 100-year event. The area of residual flooding in Figure 4.3-4 is due to flooding from Canoas Creek (see discussion of flooding for the Bypass Channel Plan).

The Channel Widening Plan would alter the depth, velocity, and duration of inundation within the Guadalupe River channel, increasing the volume of water retained within the channel in most reaches. Channel widening and floodwalls would affect Reaches 7, 8, 10A, 10C, and 11. By containing flood waters that would otherwise overflow the river bank and flow outside the channel, the improvements would increase the height of flood peaks within some reaches of the feasibility study area, as well as some downstream reaches. The reaches within the feasibility study area where increased volumes would occur would depend upon the specific characteristics of a given storm event. Under most events, increased volumes would be expected in Reaches 7 and 8. Reducing the depth and velocity of flows by providing additional channel capacity would likely reduce scouring and alter the sediment transport dynamics that currently exist. Backwater effects that presently occur up and into Ross and Canoas Creeks under high-flow conditions could also be altered and would reduce flooding from these tributaries.

Keeping floodwaters in the upper Guadalupe River channel would increase the height of flood peaks downstream of the project area. This would be a significant impact. The downtown Guadalupe River project currently under construction and the flood control improvements proposed in Reaches A and 6 (a separate but related project proposed by the SCVWD) would fully mitigate in advance these impacts in the downstream reaches to insignificance.

Water Quality

Water Resources

Impacts on surface water quality would be primarily related to activities necessary for construction of the flood control improvements. Grading and earthwork are required for the construction of a variety of flood control improvements. The Channel Widening Plan improvements would include channel widening, bench and floodwall construction, and replacement of three bridges. The structures that would be constructed for each of the alternatives are detailed in Table 2-1. Grading and earthmoving activities over a large area, particularly within the river channel itself, would likely increase erosion and the sediment load in the existing channel. These significant impacts would be mitigated to insignificance by implementing a Storm Water Pollution Prevention Plan (SWPPP) required as part of the NPDES program. The SWPPP would include measures to assure source reduction of pollutants, erosion and sediment control measures, and best management practices for reduction of pollutant discharges from stormwater runoff.

Construction activities can conceivably release and/or mobilize existing contaminants in impact-area soils, releasing them into groundwater flows. This significant impact would be mitigated to insignificance and is discussed in section 4.11.

Turbidity (i.e., suspended sediment load), can transport metals and phosphorus that bind to sediment particles. This significant impact on water quality would be mitigated to insignificance with implementation of the SWPPP and measures discussed in section 4.2.

Maintenance associated with the Channel Widening plan would include periodic trimming, removal, or treatment with EPA-approved herbicides of vegetation that is obstructing flood flows, causing structural damage, or impeding access and maintenance (see also section 4.4.3). Herbicides may also be used to control noxious weeds that degrade riparian habitat values. Herbicides would be applied in accordance with legal (label) requirements to prevent their unintended effects on aquatic habitats, by properly trained

Figure 4.3-4 Upper Guadalupe River Residual Floodplains 50-Year Project on Guadalupe River and 20-Year Project on Canoas Creek

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and certified personnel. The herbicides used would be rapidly degraded to non-toxic by-products through biological and physical processes that would occur on plants and soil, such that they are not expected to be transported in runoff and impact adjacent aquatic habitats. Herbicide use is part of the SCVWD's maintenance plan that is the subject of a Memorandum of Understanding (MOU) with the Department of Fish and Game.

Herbicide use within the existing "natural" channel, i.e. along streambanks not subject to modification, would be reduced. Herbicide use would expand in newly constructed areas, e.g., on maintenance roads along floodway benches, and along bypass channels.

Groundwater

Dewatering, or pumping water from the river, may be required for construction of some of the proposed improvements. This would have a local, temporary, less than significant effect on groundwater flow conditions except where dewatering would occur in the vicinity of hazardous waste sites. In this case, contaminated groundwater could flow away from hazardous waste sites toward dewatering wells, a significant impact that would be mitigated to insignificance. For further discussion of hazardous waste impacts, refer to section 4.11.

Long-term groundwater hydrology within the project study area, particularly groundwater recharge, would be positively affected by the proposed flood control improvements. During the winter months, the relatively low bench height would increase the effective channel width, slowing the rate of flows within the channel and increasing the residence time for flood flows. This would increase groundwater recharge potential, a beneficial impact. Another potential beneficial impact would be the removal and/or treatment of soil and groundwater contamination that might otherwise remain in place, improving the overall soil and groundwater quality within the vicinity of the Guadalupe River. The SCVWD would require that any impacts to groundwater recharge facilities in Reaches 11 and 12 be mitigated.

Bypass Channel Plan

Flooding

This alternative would also provide a beneficial effect on the hydrology of the upper Guadalupe River by reducing the existing flood hazard. The major difference between the Bypass Channel Plan and the Channel Widening Plan is that the level of protection provided by the Bypass Channel Plan flood control improvements would accommodate flows up to the 100-year flood event, as compared to the 50-year protection provided by the Channel Widening Plan. The residual flooded area following implementation of the Bypass Channel Plan is depicted in Figure 4.3-5. The level of inundation on the east side of the river is similar to that depicted in Figure 4.3-4 (i.e., protection at the 50-year flood level), while the area west of the river would be completely protected from flooding during a 100-year storm event. The residual flooding depicted in Figure 4.3-5 for the 50- and 100-year flood conditions is due to flooding from Canoas Creek.

The major bypass channel is proposed in Reaches 7 and 8, with smaller bypass channels proposed in Reaches 9 and 11A. These bypass channels would reduce water volume and depth, as well as dampen changes in the velocity and duration of flood flows in the Guadalupe River channel within the feasibility study area.

Keeping floodwaters in the upper Guadalupe River channel would increase the height of flood peaks downstream of the project area, as discussed for the Channel Widening Plan. This would be a significant impact. The downtown Guadalupe River project currently under construction and the flood control improvements proposed in Reaches A and 6 (a separate but related project proposed by the SCVWD) would fully mitigate in advance these impacts in the downstream reaches to insignificance.

Water Quality

Water quality impacts would not differ appreciably from those described above for the Channel Widening Plan. Grading and earthwork required for constructing the Bypass Channel Plan flood control improvements would be slightly greater due to the increased level of flood protection. In addition to the channel widening and bench and levee construction, the

Bypass Channel Plan would include bypass channels, numerous bridge construction and repair locations, and other flood control structures (e.g., weir drop structure, concrete culvert apron, articulated concrete mat structure, etc. [see Table 2-1]). Project grading and earthmoving activities could increase erosion and the sediment load in the existing channel. This would be a significant impact. A SWPPP would be required for the Bypass Channel Plan as part of the NPDES program and would mitigate this impact to insignificance.

As for the Channel Widening Plan, the Bypass Channel Plan would include using appropriate herbicides to control vegetation in some areas, as necessary for access and maintenance and for noxious weed control. The herbicides used would be of low toxicity to wildlife, rapidly degraded and not expected to impact surface water quality in the river. All use would be in conformity with legal requirements and an approved MOU with CDFG regarding maintenance procedures along the river. Public notification would be provided as required regarding any potential health hazards.

Herbicide use within the existing "natural" channel, i.e. along streambanks not subject to modification, would be reduced. Herbicide use would expand in newly constructed areas, e.g., on maintenance roads along floodway benches, and along bypass channels.

Groundwater

The effects on groundwater flow and quality would be similar to those described for the Channel Widening Plan. The additional bypass channel areas would provide additional surface area for groundwater recharge when flows are high enough to enter the bypass channels. This is a beneficial impact. The SCVWD would require that any impacts to groundwater recharge facilities in Reaches 11 and 12 be mitigated.

No-Action Alternative

No construction impacts would occur under the no-action alternative. Active bank erosion would continue at various locations within the feasibility study area in the absence of channel improvements. Periodic channel clearing and bank stabilization would occur on an as-needed basis.

Figure 4.3-5 Upper Guadalupe River Residual Floodplains 100-Year Project on Guadalupe River and 20-Year Project on Canoas Creek color

4.3.4 Mitigation Measures

Flooding

The flood control alternatives would provide sufficient channel capacity to reduce the threat of flooding up to the level of protection for each alternative. No specific mitigation measures regarding flooding would be needed for either of the flood control alternatives. If the Channel Widening Plan were to be implemented, additional money would need to be included with the project's costs to address the impacts associated with the inclusion of floodwalls in Reach 8 and along Ross and Canoas Creeks.

Water Quality

Mitigation measures to reduce water quality problems related to turbidity would be addressed in the SWPPP. Wherever possible, the SWPP shall incorporate measures from the EPA's Pollution Prevention/Environmental Impact Reduction Checklist for Flood Control Projects. Additional mitigations described in section 4.2 should be included in the SWPPP and implemented to assure proper mitigation of sedimentation of the river. The project would comply with EPA-approved water quality standards as specified in the Basin Plan to protect beneficial uses of the river. The Corps shall consult with the Regional Water Quality Control Board to ensure that appropriate controls are placed on construction and maintenance activities.

Mitigation of hazardous waste impacts is addressed in section 4.11. No other specific water quality mitigation would be needed under any of the flood control alternatives.

Groundwater

Mitigation of impacts on groundwater recharge facilities is required. See section 4.11 regarding hazardous waste impacts.

4.3.5 Unavoidable Significant Adverse Impacts

There would be no unavoidable significant adverse impacts on water resources with implementation of the above mitigation measures.