4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

4.1 AIR QUALITY

Air quality in the immediate project area and surrounding regional environment of the San Francisco Bay Area Air Basin (SFBAAB) would be affected by emissions from construction of the Channel Widening and Bypass Channel Plan alternatives. The following section includes a description of the affected air quality resource, impacts estimated from the proposed alternatives, and mitigations that would lessen significant project impacts.

4.1.1 Regulatory Setting

Air quality regulations were first promulgated with the *Federal Clean Air Act of 1969*. This act established the national ambient air quality standards and delegated the enforcement of air pollution control regulations to the states. In California, the Air Resources Board (ARB) enforces air regulations, but delegates the responsibility of stationary emission source regulation to local air pollution agencies. In the project area, the Bay Area Air Quality Management District (BAAQMD) is responsible for air pollution source regulation. Appendix A of this EIS/R contains a complete description of rules and regulations that apply to the project alternatives.

4.1.2 Existing Conditions

Description of Resource

Air quality at a given location is often described by the concentrations of pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter (mg/m^3). The significance of a pollutant concentration is determined by comparing its concentration to an applicable national and/or state ambient air quality standard. These standards represent allowable atmospheric concentrations that protect public health and welfare and include a reasonable margin of safety to protect the more sensitive individuals in the population. National standards established by the EPA are termed the National Ambient Air Quality Standards (NAAQS) and are defined as the maximum acceptable concentrations that may not be exceeded more than once per year, except the annual standards, which may never be exceeded. State standards established by the ARB are termed the California Ambient Air Quality Standards (CAAQS). The CAAQS are defined as the maximum acceptable pollutant concentrations that are not to be equaled or exceeded. The NAAQS and CAAQS are presented in Appendix A, Table A-1. The main pollutants considered in this analysis include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and respirable particulate matter (PM_{10}).

Region of Influence (ROI)

The project area is located in Santa Clara County, which is part of the SFBAAB, which includes the counties of Santa Clara, San Mateo, San Francisco, Marin, Napa, Contra Costa, Alameda, and the southeast portion of Sonoma and the southwest portion of Solano counties. The SFBAAB covers an area of approximately 5,540 square miles. Identifying the ROI for air quality requires knowledge of the types of pollutants emitted, the emission rates and release parameters of the pollutant source, the source proximity to other pollutant sources, and local and regional meteorological conditions. The ROI for emissions of inert pollutants (pollutants other than O_3 and its precursors) is generally limited to a few miles downwind from a source.

The ROI for O_3 can extend much farther downwind than for inert pollutants. Ozone is a secondary pollutant formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors. Ozone precursors are mainly the reactive organic gas (ROG) portion of volatile organic compounds (VOC) and nitrogen oxides (NO_x). In the presence of solar radiation, the maximum effect of ROG and NO_x emissions on O_3 levels usually occurs several hours after they are emitted and many miles from the source. Ozone and O_3 precursors transported from other regions can also combine with local emissions to increase local O_3 concentrations. Therefore, the ROI for O_3 from proposed construction activities could include a large portion of the SFBAAB.

Climate and Meteorology

The climate of the project area is classified as Mediterranean, characterized by warm, dry summers and mild, wet winters. The major influence on the regional climate is the Eastern Pacific High pressure system. Seasonal variations in the position and strength of this system are a key factor in producing weather changes in the area.

The Eastern Pacific High attains its greatest strength and most northerly position during the summer, when it is centered west of northern California. In this location, the High effectively shelters California from the effects of polar storm systems originating from the North Pacific. Large-scale downward motion associated with the High produces an elevated temperature inversion along the West Coast. The base of this inversion usually occurs from 1,000 to 3,000 feet above mean sea level and limits vertical mixing and thereby traps air pollutants in the lower atmosphere. Marine air confined below the base of the inversion often condenses into fog and stratus clouds due to contact with the cool Pacific Ocean. Stratus clouds are a mainstay of regional weather during the warmer months of the year from roughly May through October. These clouds often form offshore and move in through the Golden Gate and over the Peninsula during the evening hours toward the project area. As the land heats up during the following morning, clouds generally burn off over the coastline, then move back onshore the following evening.

With the approach of winter, the High begins to weaken and shift to the south, allowing polar storms to pass through the region. These storms produce periods of cloudiness, strong shifting winds, and precipitation. Storm conditions are usually followed by periods of clear skies, cool temperatures, and gusty northwest winds as storm systems move eastward. The number of days with precipitation varies greatly from year to year, resulting in a wide range of annual precipitation totals. The annual average precipitation total for the San Jose Airport is about 14 inches (BAAQMD 1985). Rainfall in the project region increases toward the higher terrain of the Guadalupe River watershed. About 90 percent of rainfall in the region occurs from November through April.

The July average daily maximum and January average daily minimum temperatures at the project area are 82^{o} F and 40^{o} F, respectively (BAAQMD 1985). Temperature extremes increase inland, as the moderating effects of the San Francisco Bay waters lessen.

The proximity of the Eastern Pacific High and a thermal low pressure system in the Central Valley region to the east produces a prevailing west to northwest air flow along the central and northern California coast for most of the year. This condition is a major factor in minimizing air quality impacts from almost 6 million people that live in the region. The northwest to southeast orientation of the Santa Clara Valley confines the wind flow in the project area. Northwest winds generally prevail during the daytime hours and southeast winds occur at night.

During the cooler months of the year, the Eastern Pacific High can combine with high pressure over the Great Basin to produce extended periods of light winds and low-level temperature inversions. This condition frequently produces poor atmospheric dispersion that can produce elevated levels of inert pollutants, such as CO and PM_{10}. Ozone standards traditionally are exceeded when this condition occurs during the warmer months of the year.

Baseline Air Quality

The EPA designates all areas of the United States as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. A nonattainment designation means that a primary NAAQS has been exceeded more than three discontinuous times in 3 years in a given area. Pollutants in an area are often designated as unclassified when there is a lack of data for the EPA to form a basis of attainment status. The SFBAAB is in attainment for NO_2, O_3, and SO_2 and in nonattainment for CO. The SFBAAB was redesignated from nonattainment to attainment of the O_3 standard in 1995 by the EPA (now referred to as a maintenance area for O_3). The CO nonattainment areas within the SFBAAB are limited to the Vallejo-Fairfield-Napa and San Jose metropolitan areas. The San Jose CO nonattainment area encompasses the project site and is produced by the combination of excessive mobile source emissions and the high frequency of surface-based temperature inversions during the winter months in the Santa Clara Valley. Since an exceedance of the CO NAAQS has not occurred in the SFBAAB since 1991, the BAAQMD has requested that the EPA redesignate the region as attainment for CO (BAAQMD 1993). The SFBAAB is also designated as in attainment for the annual PM_{10} standard and unclassified for the 24-hour PM_{10} standard (BAAQMD 1995).

The ARB designates areas of the state as either in attainment or nonattainment of the CAAQS. An area is in nonattainment if the CAAQS has been exceeded more than once in 3 years. At the present time, the SFBAAB is in nonattainment of the CAAQS for O_3 and PM_{10}. The SFBAAB is designated as a "serious" nonattainment area for O_3 by the ARB. The ARB redesignated the SFBAAB as attainment for CO in 1994.

San Francisco Bay Area Air Basin Emissions

Table 4.1-1 displays an estimate of air emissions that occurred within the SFBAAB in 1995. These data are projections from the SFBAAB 1990 base year emission inventory and incorporate factors such as population growth, lower emitting motor vehicles, and the implementation of current and proposed emission control measures (BAAQMD 1995). Transportation sources are one of the largest contributors to air pollutants in the SFBAAB. Motor vehicles account for approximately 45 percent of the ROG, 66 percent of the CO, 44 percent of the NO_x, and 10 percent of the SO_2 emitted in the SFBAAB (BAAQMD 1995). Table 4.1-1 also shows the total emissions for Santa Clara County.

4.1.3 Environmental Effects

Impact Significance Criteria

Criteria to determine the significance of air quality impacts are based on federal, state, and local air pollution standards and regulations. Impacts would be considered significant if project emissions (1) increase ambient pollutant levels from below to above a NAAQS or CAAQS or (2) substantially contribute to an existing or projected air quality standard violation. Any emissions of PM_{10} during construction are considered significant and require implementation of feasible fugitive dust control measures (BAAQMD 1995). Additionally, project impacts would be potentially significant if proposed construction or operational activities exceeded the emission thresholds that trigger a conformity analysis under Section 176(c) of the 1990 Clean Air Act Amendments (1990 CAA) (100 tons per year for CO or 50 tons per year of VOC, as identified in Appendix A).

Table 4.1-1
1995 Emission Inventory for the San Francisco Bay Area Air Basin
(tons/day)

	ROG	*CO*	*NO_x*	*SO_x*	*PM_{10}*
Residential	63	198	26	1	17
Commercial	82	94	0	0	7
Industrial	90	94	89	63	14
Infrastructure	1	9	34	1	1
Construction	13	213	54	5	61
Transportation	262	1792	245	31	321
Agricultural and Natural	23	24	6	0	41
Total - Bay Area Air Quality Management District	**535**	**2,425**	**454**	**102**	**462**
Total - Santa Clara County	**122**	**598**	**95**	**6**	**119**

Source: BAAQMD 1995.

Channel Widening Plan

Construction

Air Quality

Air quality impacts associated with construction of the Channel Widening Plan would occur from combustive emissions due to heavy equipment usage and PM_{10} emissions in the form of fugitive dust due to ground disturbance and earthmoving activities. Impacts due to combustive emissions from these sources would be less than significant, since most construction emission sources would be mobile and intermittent in nature and pollutant impacts from these sources would not be large enough in a localized area to cause or contribute to any exceedance of an ambient air quality standard. Emissions of fugitive dust due to ground disturbance and earthmoving activities would be potentially significant, but feasibly mitigated. Proper implementation of BAAQMD fugitive dust control measures during construction of the Plan would reduce the impact of these emissions to less than significant. The BAAQMD fugitive dust control measures are presented in section 4.1.4. All other air quality impacts from the Plan would be less than significant. Air quality impacts from the construction of the Channel Widening Plan would be short-term and only last for the duration of construction activities.

Operation

Routine flood control maintenance activities would generate long-term air quality impacts associated with vehicle and equipment use. Although erosion control in the feasibility study area would be decreased and sediment removal would probably stay at current levels, vegetation removal could increase related to maintenance of mitigation plantings. Clean-up activities associated with flood events would decrease. Together, these effects would generally result in no more than a minimal increase in emissions in the project area from current flood control activities. Operational air quality impacts associated with the Channel Widening Plan would therefore be considered less than significant.

Bypass Channel Plan

Construction

The magnitude of construction activities and resulting air quality impacts associated with the Bypass Channel Plan would be greater than those identified for the Channel Widening Plan. However, with proper implementation of BAAQMD fugitive dust emission control measures, impacts from fugitive dust would remain less than significant. All other air quality impacts from the Bypass Channel Plan would be insignificant. Air quality impacts from the construction of the Plan would be short-term and only last for the duration of construction activities.

Operation

Similar to the Channel Widening Plan, operational impacts associated with the Bypass Channel Plan would occur from routine flood control maintenance activities. Vegetation management would increase in some areas (e.g., vegetation clearing along ramps, and portions of benches and bypasses) while decreasing in other areas. Emissions from these activities would increase only slightly along the portions of the Guadalupe River affected by the Plan from current maintenance activities. Cleanup activities associated with flood events would decrease. These effects would generally result in no more than a minimal increase in emissions in the project area from current flood control activities, and a minimal impact associated with increased sediment removal. Operational air quality impacts associated with the Bypass Channel Plan would therefore be considered insignificant.

Conformity Determination

Since the project area is currently designated as a maintenance area for O_3 and nonattainment for CO, a project alternative would trigger a conformity analysis under Section 176(c) of the 1990 CAA if its emissions exceeded (1) 100 tons per year of CO or 50 tons per year of VOC or (2) 10 percent of the total SFBAAB inventories for VOC or CO (19,528 and 16,863 tons per year, respectively). The Bypass Channel Plan was chosen for analysis over the Channel-widening Plan, since this project alternative would produce the greatest amount of emissions. The analysis focused on short-term construction impacts, as long-term operational impacts from the project would only occur from occasional maintenance activities and would produce minor amounts of emissions. Construction emissions were based on construction equipment fuel usage data provided by the COE (personal communication, William DeJager). The results of the analysis determined that short-term construction emissions of VOC and CO from the Bypass Channel Plan would

amount to 0.9 and 11.6 tons per year, respectively, and would not exceed their applicable de minimis thresholds. These emissions would also be well below 10 percent of the SFBAAB emission inventories for these pollutants. Consequently, further conformity analysis is not required and the proposed emissions would conform to the most recent federally-approved SIP, as required by Section 176(c) of the 1990 CAA. Since construction emissions from the Channel Widening Plan would be less than those that would occur from the Bypass Channel Plan, the Channel Widening Plan also would not trigger a conformity analysis. Details of the project conformity determination are provided in Appendices B and C of this EIS/R.

No-Action Alternative

Under the No-Action Alternative, the Channel Widening and Bypass Channel Plans would not be constructed and air quality impacts associated with these actions would not occur. However, an unquantifiable amount of pollutant emissions would result from clean-up equipment subsequent to flood events. While the amount of cleanup would vary depending upon the magnitude of flooding, the associated air quality impacts would be insignificant.

4.1.4 Mitigation Measures

Channel Widening Plan

Since the Channel Widening Plan would disturb ground areas of more than 4 acres in size, generating PM_{10} emissions, the following enhanced fugitive dust emission control measures identified by the BAAQMD would be required during construction activities to ensure that dust impacts remain less than significant. These measures should not conflict with the goals of the biological restoration program:

1. Water all active construction areas at least twice daily.

2. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of space from the top of the holding area.

3. Apply water three times daily on all unpaved access roads, parking areas, and staging areas at construction sites.

4. Sweep daily (preferably with water sweepers) all paved access roads, parking areas, staging areas at construction sites, and adjacent public streets if soil material is visible.

5. Hydroseed or apply soil stabilizers (non-toxic) to inactive construction areas.

6. Enclose, cover, water twice daily, or apply soil stabilizers (non-toxic) to exposed stockpiles (dirt, sand, etc.).

7. Limit traffic speeds on unpaved roads to 15 mph.

8. Replant vegetation in disturbed areas as quickly as possible.

9. To minimize combustive emissions from construction equipment, internal combustive engines should be idled at a minimum and properly maintained and operated.

Bypass Channel Plan

Implementation of the mitigation measures identified in section 4.1.4 would ensure that air quality impacts from the Bypass Channel Plan would remain less than significant.

4.1.5 Unavoidable Significant Adverse Impacts

No unavoidable significant air quality impacts would occur from construction or operation of the Channel Widening or Bypass Channel plans.