Section 3.6
Air Quality

Introduction

This section identifies and evaluates issues related to air quality.

The "Affected Environment" discussion below describes the current setting of the action area. The purpose of this information is to establish the existing environmental context, or background, against which the reader can then understand the environmental changes caused by the action. The environmental setting information is intended to be directly or indirectly relevant to the subsequent discussion of impacts. For example, the setting describes the air pollutants of most concern in the region because the action could contribute to polluted conditions.

The environmental changes associated with the action are discussed under "Environmental Consequences." This section identifies impacts, describes how they would occur, and prescribes mitigation measures to reduce significant impacts.

Affected Environment

Environmental Setting

Climate/Meteorology

Cool rainy winters and warm dry summers characterize the climate of Mare Island. Similar to the rest of the Bay Area, the Vallejo region is classified as a Marine West Coast climate type with Mediterranean characteristics. The average rainfall ranges from 17 to 20 inches per year. Winter temperatures are generally 40º to 60º F, and summer temperatures are generally 55º to 80º F. The prevailing wind direction in Vallejo is from the west. Typical wind speeds are less than 5 miles per hour (mph) in the fall and winter and approximately 10 mph in the spring and summer.

The wind direction in the action area is from the west. The hills to the east of Pier 35 and the berm near the housing and academic facilities provide an effective windshield for the eastern side of Mare Island. Despite this windshield, the dispersion of pollutants is relatively effective in the region because of the topographic, atmospheric, and climatic characteristics of the area.

The concentration of a given pollutant in the atmosphere is determined by the amount of the pollutant emitted and the atmosphere's ability to transport and dilute the pollutant. The major determinants of air pollution transport and dilution are wind, atmospheric stability, terrain, and insulation (i.e., exposure to sunlight).

Existing Air Quality Conditions

The action area is located in the San Francisco Bay Area Air Basin (SFBAAB). For the purpose of this analysis, existing air quality conditions in the basin and the action area are characterized using the standards and terminology ascribed by regulatory agencies, such as the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB).

EPA has identified specific pollutants (called criteria pollutants) that are of concern with respect to the health and welfare of the general public. The criteria pollutants are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone, particulate matter 10 microns or less in diameter (PM10), and lead. EPA has established the National Ambient Air Quality Standards (NAAQS) for these pollutants. Similarly, CARB has established California Ambient Air Quality Standards (CAAQS), which are more stringent than the NAAQS. Table 3.6-1 lists the national and state standards for criteria pollutants.

In July 1997, EPA promulgated stricter standards for ozone and particulate matter 2.5 microns or less in diameter (PM2.5). Attainment of the new 8-hour ozone standard would not be required until after the 1-hour standard is achieved. Up to 15 years are allowed for attaining the new PM2.5 standard. The PM10 standard also was revised, but the existing PM10 standard remains in effect until attainment is achieved. In April 2004, the EPA determined that the Bay Area had an attainment record for the national 1-hour ozone standard. EPA must approve a redesignation request, currently under development, in order for the Bay Area to be redesignated to attainment status for the 1-hour standard. In June 2004, the Bay Area was designated as a marginal nonattainment area of the national 8-hour ozone standard.

The BAAQMD, in cooperation with the Metropolitan Transportation Commission and the Association of Bay Area Governments, is preparing the Bay Area Ozone Strategy. The Ozone Strategy will address national and state air quality planning requirements. The Ozone Strategy will include a redesignation request and a maintenance plan for the national 1-hour ozone standard and a triennial revision to the Bay Area strategy to attain the California State 1-hour ozone standard.

Table 3.6-1. Ambient Air Quality Standards Applicable in California

			Standard (parts per million)		Standard (micrograms per cubic meter)		Violation Criteria	
Pollutant	Symbol	Average Time	California	National	California	National	California	National
Ozone	O_3	1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
		8 hours	NA	0.08	NA	157	NA	If exceeded on more than 3 days in 3 years
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
(Lake Tahoe only)		8 hours	6	NA	7,000	NA	If equaled or exceeded	NA
Nitrogen dioxide	NO_2	Annual average	NA	0.053	NA	100	NA	If exceeded
		1 hour	0.25	NA	470	NA	If exceeded	
Sulfur dioxide	SO_2	Annual average	NA	0.03	NA	80	NA	If exceeded
		24 hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.25	NA	655	NA	NA	NA
Hydrogen sulfide	H_2S	1 hour	0.03	NA	42	NA	If equaled or exceeded	NA
Vinyl chloride	C_2H_3Cl	24 hours	0.010	NA	26	NA	If equaled or exceeded	NA
Inhalable particulate matter	PM10	Annual geometric mean	NA	NA	20	NA	If exceeded	NA
		Annual arithmetic mean	NA	NA	NA	50	NA	If exceeded
		24 hours	NA	NA	50	150	If exceeded	If average 1% over 3 years is exceeded
	PM2.5	Annual geometric mean	NA	NA	12	NA	If exceeded	NA
		Annual arithmetic mean	NA	NA	NA	15	NA	If exceeded
		24 hours	NA	NA	NA	65	NA	If average 2% over 3 years is exceeded

Table 3.6-1. Continued

Pollutant	Symbol	Average Time	Standard (parts per million)		Standard (micrograms per cubic meter)		Violation Criteria	
			California	National	California	National	California	National
Sulfate particles	SO_4	24 hours	NA	NA	24	NA	If equaled or exceeded	NA
Lead particles	Pb	Calendar quarter	NA	NA	NA	1.5	NA	If exceeded no more than 1 day per year
		30 days	NA	NA	1.5	NA	If equaled or exceeded	NA

Notes:
All standards are based on measurements at 25ºC and 1 atmosphere pressure.
National standards shown are the primary (health effects) standards.
NA = not applicable.

The existing air quality conditions in the action area can be characterized by local monitoring data for criteria pollutants. PM10, CO, and ozone are the pollutants of greatest concentration in the county and are therefore the pollutants of most concern for the purposes of this analysis. Concentrations of these pollutants are measured at several monitoring stations in Solano County. Table 3.6-2 presents air quality monitoring data from the last three years for which data are available. As seen in Table 3.6-2, ozone and PM10 levels in the area have violated the state and federal ozone standards and state PM10 standard during the last three years. However, the federal and state CO standards have not been violated.

Based on the violations measured by monitoring stations, areas such as the SFBAAB are classified by the State of California and EPA as either *attainment, nonattainment,* or *not classified* with respect to state and federal ambient air quality standards. Nonattainment classifications are sometimes further refined with designations of *serious* or *severe*. With respect to state standards, the SFBAAB is in serious nonattainment for ozone, nonattainment for PM10, and attainment for CO. With respect to federal standards, the SFBAAB is unclassified for PM10, attainment for CO, and moderate nonattainment for ozone (with a 2006 attainment deadline). Also, EPA has designated Solano County portions of the SFBAAB as being not classified for PM10 and not classified/attainment for CO.

Description of Pollutants

The discussion below focuses on ozone, CO, and PM10 because

- levels of PM10 and ozone in the Fairfield-Vallejo area have violated state or federal standards within the last three years and
- projected increases in population, vehicle trips, and vehicle miles traveled could result in excessive CO concentrations in the project area.

Ozone

Ozone is a public health concern because it is a respiratory irritant that also increases susceptibility to respiratory infections. Ozone also causes substantial damage to leaf tissues of crops and natural vegetation, and it damages many materials by acting as a chemical oxidizing agent.

Ozone, the main component of photochemical smog, is primarily a summer and fall pollution problem. Ozone is not emitted directly into the air, but is formed through a complex series of chemical reactions involving sunlight and chemical compounds (known as ozone precursors, including reactive organic gases [ROG] and oxides of nitrogen [NO_x]). The period required for ozone formation allows the reacting compounds to spread over a large area, producing a regional pollution problem. Ozone precursors, ROG and NO_x, are emitted by mobile sources and by stationary combustion equipment. However, ozone problems are the cumulative result of regional development patterns, rather than the result of a few emission sources.

State and federal standards for ozone have been set for a 1-hour averaging time. The state 1-hour ozone standard is 0.09 parts per million (ppm), not to be exceeded. The federal 1-hour ozone standard is 0.12 ppm, not to be exceeded more than three times in any 3-year period. The federal 8-hour standard is 0.08 ppm.

Table 3.6-2 indicates that the Fairfield-Vallejo region, including the action area, has experienced occasional violations of the state and federal ozone standards during the 3 most recent years for which data are available (1998–2000).

Carbon Monoxide

CO is a public health concern because CO combines with hemoglobin and thereby reduces the rate at which oxygen is transported in the bloodstream. Because CO binds to hemoglobin 220–245 times more strongly than oxygen, even low concentrations of CO can significantly affect the blood oxygen concentration. Both the cardiovascular and central nervous systems can be affected when 25–40 percent of the hemoglobin in the bloodstream is bound to CO rather than to oxygen. Effects on humans range from slight headaches to nausea to death. State and federal ambient air quality standards for CO have been set at levels intended to keep CO from combining with more than 15 percent of the body's hemoglobin (EPA 1978, California Air Resources Board 1982). CO is essentially inert to plants and materials.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 ppm by volume, and the federal 1-hour standard is 35 ppm. The state and federal 8-hour standards are both 9 ppm. State standards represent values not to be exceeded; federal standards are values not to be exceeded more than once per year.

Table 3.6-2 indicates that there have been no violations of the state and federal CO standards in the region during the 3 most recent years for which data are available (1998–2000).

PM10

Health concerns associated with suspended particulate matter focus on particles small enough to reach the lungs when inhaled. Few particles larger than 10 microns in diameter reach the lungs. Smaller suspended particles or droplets, designated as PM10, can lodge in the lungs and contribute to respiratory

Table 3.6-2. Ambient Air Quality Monitoring Data from Solano County Monitoring Stations

Pollutant Standards	1998	1999	2000
Ozone—Fairfield			
Maximum 1-hour concentration (ppm)	0.121	0.129	0.096
Number of Days Standard Violated			
CAAQS (1-hour) > 0.09 ppm	9	9	1
NAAQS (1-hour) > 0.12 ppm	0	1	0
Ozone—Vacaville: Elmira Road			
Maximum 1-hour concentration (ppm)	0.137	0.140	0.100
Number of Days Standard Violated			
CAAQS (1-hour) > 0.09 ppm	10	8	2
NAAQS (1-hour) > 0.12 ppm	2	1	0
Ozone—Vallejo: 304 Tuolumne St.			
Maximum 1-hour concentration (ppm)	0.119	0.113	0.079
Number of Days Standard Violated			
CAAQS (1-hour) > 0.09 ppm	3	4	0
NAAQS (1-hour) > 0.12 ppm	0	0	0
Carbon Monoxide—Vallejo: 304 Tuolumne St.			
Maximum 8-hour concentration (ppm)	5.3	5.49	5.11
Maximum 1-hour concentration (ppm)	7.2	6.6	6.5
Number of Days Standard Violated			
CAAQS (8-hour) $\geq$ 9.0 ppm	0	0	0
NAAQS (8-hour) $\geq$ 9.0 ppm	0	0	0
CAAQS (1-hour) $\geq$ 20 ppm	0	0	0
NAAQS (1-hour) $\geq$ 35 ppm	0	0	0
Particulate Matter (PM10)—Vallejo: 304 Tuolumne St.			
Maximum 24-hour concentration ($\mu g/m^3$)	71.3	83.7	53.0
Second Highest 24-hour concentration ($\mu g/m^3$)	40.9	62.0	45.8
Average geometric mean concentration ($\mu g/m^3$)	14	16	13
Average arithmetic mean concentration ($\mu g/m^3$)	17	19	15
Number of Days Standard Violated[1]			
CAAQS (24-hour) > 50 $\mu g/m^3$	6	18	6
NAAQS (24-hour) > 150 $\mu g/m^3$	0	0	0
Particulate Matter (PM10)—Vacaville: Merchant St.			
Maximum 24-hour concentration ($\mu g/m^3$)	56.0	66.0	47.0
Second Highest 24-hour concentration ($\mu g/m^3$)	46.0	62.0	44.0
Average geometric mean concentration ($\mu g/m^3$)	15	17	16

Table 3.6-2. Continued

Pollutant Standards	1998	1999	2000
Average arithmetic mean concentration ($\mu g/m^3$)	17	19	18
Number of Days Standard Violated[1]			
CAAQS (24-hour) > 50 $\mu g/m^3$	6	18	0
NAAQS (24-hour) > 150 $\mu g/m^3$	0	0	0

[1] Calculated violations based on measurements taken every 6 days.

CAAQS = California Ambient Air Quality Standards.

NAAQS = National Ambient Air Quality Standards.

ppm = parts per million.

$\mu g/m^3$ = micrograms per cubic meter.

Sources: California Air Resources Board 2002, Environmental Protection Agency 2002.

problems. The smallest particles inhaled are deposited in the lungs and can cause permanent lung damage. Fine particles also can have a damaging effect on health by interfering with the body's mechanism for clearing the respiratory tract or by acting as a carrier of absorbed toxic substances. Finally, particulates can retard plant growth, reduce visibility, soil buildings and other materials, and corrode materials.

PM10 arises from sources such as agricultural activities, industrial emissions, dust suspended by vehicle traffic, diesel soot, abrasion of tires and brakes, construction, operations, and dust carried by windstorms. It is also formed in the atmosphere from reactions of NO_2 and SO_2 with ammonia.

State and federal PM10 standards have been set for 24-hour and annual averaging times. The state and federal 24-hour standards are 50 and 150 micrograms per cubic meter ($\mu g/m^3$), respectively. The state annual standard is 30 $\mu g/m^3$ as an annual geometric mean, and the federal annual PM10 standard is 50 $\mu g/m^3$ as an annual arithmetic mean. (*Geometric mean* equals the *n*th root of the product of *n* observations. *Arithmetic mean* is the sum of the total observations divided by the number of observations.) Federal and state 24-hour standards may not be exceeded more than 1 day per year, and annual standards are not to be exceeded.

Table 3.6-2 indicates that the region has experienced occasional violations of the state PM10 standard and no violations of the federal PM10 standard during the 3 most recent years for which data are available (1998–2000).

Odor

Objectionable odor is smell ranging from odiferous to nauseating. The principal dimensions of an odor are its detection threshold, intensity, and character. The identification and degree of its objectionable nature is very subjective and varies from individual to individual. There are no sources of odor within the limits of the action area, except for the natural smells of the salt marsh.

Toxic Air Contaminants

In addition to the criteria pollutants listed above (ozone, CO, and PM10), toxic air contaminants are also regulated by EPA and the designated state or local air quality agency or district.

Sensitive Receptors

BAAQMD defines sensitive receptors as facilities most likely to be used by the elderly, children, the infirm, or people with particular sensitivity to air pollutants. Sensitive receptors in the project vicinity consist of occupants of the housing and academic facilities on Mare Island; residents of Sandy Beach; recreational users

of the golf course; and boat users in Carquinez Strait, San Pablo Bay, and Mare Island Strait.

Regulatory Setting

Federal Regulations

Clean Air Act

The federal Clean Air Act was passed in 1970 and amended twice afterward (including in 1990). The act establishes the framework for modern air pollution control, and delegates primary responsibility for regulating air quality to EPA. EPA develops rules and regulations to preserve and improve air quality, as well as delegating specific responsibilities to state and local agencies.

Specifically, the Clean Air Act and amendments direct EPA to establish ambient air standards for six pollutants: ozone, CO, lead, NO_2, particulate matter, and SO_2. The standards are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety, and the latter to protect environmental values, such as plant and animal life.

As discussed earlier, areas that do not meet the federal NAAQS (Table 3.6-1) are called nonattainment areas. For nonattainment areas, the Clean Air Act requires states to develop and adopt State Implementation Plans (SIPs), which are air quality plans showing how air quality standards will be attained. SIPs, which are reviewed and approved by EPA, must demonstrate how the federal standards will be achieved. Failing to submit a plan or secure approval could lead to denial of federal funding and permits for such improvements as highway construction and sewage treatment plants. In cases in which a SIP is submitted by the state but fails to demonstrate achievement of the standards, EPA is directed to prepare a Federal Implementation Plan.

General Conformity

In accordance with Section 176(c), EPA adopted the final conformity rule for general federal actions on November 30, 1993, which is codified as Title 40, Code of Federal Regulations (CFR), Part 51, Subpart W; and 40 CFR 93 Subpart B. The 40 CFR 93 Subpart B applies to federal agencies until states revise their SIPs to adopt a conformity rule at least as stringent as EPA's rule (40 CFR 51 Subpart W).

According to 40 CFR 93 Subpart B, determining conformity is essentially a two-step process: (1) applicability analysis and (2) conformity analysis. Applicability analysis is performed according to Subpart 93.153 wherein *de minimis* thresholds based on the region's nonattainment status and regional emission levels are established for total project direct and indirect pollutant

emissions. Conformity analysis is not required for projects where the total direct and indirect emissions caused by the federal action are less than the respective thresholds.

A general conformity determination is required by 40 CFR 51(W) and 40 CFR 93(B). The general conformity regulation requires that federal agencies sponsoring non-transportation-related activities show that the emissions associated with those activities conform to SIPs if emissions have certain characteristics. To be subject to the requirement,

- the emissions must occur in areas designated as in nonattainment for one or more of the NAAQS and
- those emissions must exceed certain *de minimis* threshold levels (40 CFR 93.153[1]).

The rule excludes programs specifically included in a transportation plan or program that is found to conform under the federal transportation conformity rule, (40 CFR 153 [a]) and certain other projects that are exempt or presumed to conform (40 CFR 93.153 [2]).

The project study area is located in an air basin classified as a nonattainment area for the federal ozone standards. As required by the Clean Air Act, states and the designated air districts establish SIPs to demonstrate that nonattainment areas have a viable plan to reach attainment. Section 176(c) of the Clean Air Act requires that federal actions conform to the most recent federally approved SIP. Conformity to an implementation plan means that

- a project will conform to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards and
- a project will not (a) cause or contribute to any new violations of any standard in any area, (b) increase the frequency or severity of any existing standard violation in any area, or (c) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area. The determination of conformity shall be based on the most recent estimates of emissions, as determined by the metropolitan planning organization or other agency authorized to make such estimates.

For the action area, *de minimis* values for conformity analysis and the 10 percent Solano County area inventory levels are presented in Table 3.6-3.

Table 3.6-3. *De Minimis* and 10 Percent Area Inventory Levels for CO and VOC for the San Francisco Bay Area Air Basin

Pollutant	De Minimis Value (tons/year)	10 percent Area Inventory Level (tons/year)
CO	100	1,278
VOCs	100	4,380

VOC = Volatile organic compound.

The definitions of total direct and indirect emissions for conformity purposes distinguish emissions according to timing and location rather than the type of emission source. Direct emissions occur at the same time and place as the federal action. Indirect emissions include those that may occur later in time or at a distance from the federal action. In addition, the conformity rule limits the scope of indirect emissions to those that can be quantified and are reasonably foreseeable by the federal agency at the time of analysis, and those for which the federal agency can practicably control through its continuing program responsibility.

The total direct and indirect project emissions were calculated and compared to the thresholds in Table 3.6-3. Based on this analysis, the project emissions would conform in accordance with 40 CFR 93. This analysis supports the conformity determination for the proposed action and demonstrates that the activities associated with this action would comply with Section 176(c) of the Clean Air Act, as amended.

State Regulations

In California, EPA has delegated authority to prepare SIPs to CARB, which, in turn, has delegated that authority to individual air districts. CARB maintains oversight authority in air quality planning, develops programs for reducing emissions from motor vehicles, develops air emission inventories, collects air quality and meteorological data, and approves the SIP. In addition, CARB establishes state air quality standards, which are more stringent than federal standards.

Responsibilities of air districts include overseeing stationary source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality–related sections of environmental documents required by the California Environmental Quality Act (CEQA).

California Clean Air Act

The California Clean Air Act (CCAA) of 1988 substantially added to the authority and responsibilities of air districts. CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement Transportation Control Measures (TCMs). It focuses on attainment of the state ambient air quality standards, which, for certain pollutants and averaging periods, are more stringent than the comparable federal standards.

CCAA requires designation of attainment and nonattainment areas with respect to state ambient air quality standards. It also requires that local and regional air districts expeditiously adopt and prepare an air quality attainment plan if the district violates state air quality standards for CO, SO_2, NO_2, or ozone. These Clean Air Plans are specifically intended to attain these standards and must be designed to achieve an annual 5 percent reduction in district-wide emissions of each nonattainment pollutant or its precursors. No locally prepared attainment plans are required for areas that violate the state PM10 standards.

CCAA requires that the state air quality standards be met as expeditiously as practicable but, unlike the federal Clean Air Act, does not set precise attainment deadlines. Instead, the act establishes increasingly stringent requirements for areas that will require more time to achieve the standards.

CCAA emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. It gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish TCMs. CCAA does not define *indirect and area-wide sources*. However, Section 110 of the federal Clean Air Act defines an indirect source as

> a facility, building, structure, installation, real property, road, or highway which attracts, or may attract, mobile sources of pollution. Such term includes parking lots, parking garages, and other facilities subject to any measure for management of parking supply….

TCMs are defined in CCAA as "any strategy to reduce trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing vehicle emissions."

Recently enacted amendments to CCAA impose additional requirements designed to ensure an improvement in air quality within the next 5 years. More specifically, local districts with moderate air pollution that do not achieve "transitional nonattainment" status by December 31, 1997 must implement the more stringent measures applicable to districts with serious air pollution

Local Regulations

Bay Area Air Quality Management District

BAAQMD has recently prepared two air quality plans designed to bring the SFBAAB into attainment with ozone standards. The 1999 Ozone Attainment Plan was designed to bring the SFBAAB into attainment with federal ozone ambient air quality standards. In addition, on December 20, 2000, BAAQMD adopted the 2000 Clean Air Plan (CAP) (Bay Area Air Quality Management District 2000). The current CAP represents the third triennial update of the 1991 CAP. It contains additional rules and regulations designed to bring the SFBAAB into attainment of California ozone ambient air quality standards.

The Bay Area did not attain the federal ozone standard by the 2000 deadline stipulated in the 1999 Ozone Attainment Plan. As a result, EPA disapproved the 1999 Ozone Attainment Plan and required preparation of a new plan providing for an updated VOC and NO_x emissions inventory and new transportation conformity budgets. In response, BAAQMD developed the San Francisco Bay Area 2001 Ozone Attainment Plan for the 1-Hour National Ozone Standard (2001 Plan).

The 2001 Plan was formally adopted by BAAQMD, the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG) on October 26, 2001. In November 2001, CARB also approved the 2001 Plan and submitted it to EPA for review and approval. The 2001 Plan is currently in EPA review (California Air Resources Board 2002). Also in November 2001, to support the on-road motor vehicle emission inventory and transportation conformity budgets in the 2001 Plan, CARB transmitted the San Francisco Bay Area–EMFAC2000 model to EPA for approval for the Bay Area. As of this writing, only the Mobile Source Emissions Budgets have been approved for conformity, and EPA has not taken action on the plan as a whole.

The deadline for attainment of the federal ozone standard under the 2001 Plan is 2006. The 2001 Plan contains a control strategy that incorporates seven new stationary source measures, five new transportation control measures, and 11 further-study measures. The 2001 Plan also includes a commitment to strengthen the Smog Check Program and to a new assessment of attainment status based on available data for the Bay Area. The Bay Area 2001 Ozone Attainment Plan for the national 1-hour ozone standard (adopted October 24, 2001) included two commitments for further planning: (1) a commitment to conduct a mid-course review of progress toward attaining the national 1-hour ozone standard by December 2003 and (2) a commitment to provide a revised ozone attainment strategy to EPA by April 2004.

In April 2004, EPA made a final finding that the Bay Area has attained the national 1-hour ozone standard. Because of this finding, the previous planning commitments in the 2001 Ozone Attainment Plan are no longer required. The finding of attainment does not mean the Bay Area has been reclassified as an attainment area for the 1-hour standard. The region must submit a redesignation

request to EPA in order to be reclassified as an attainment area. Therefore, the portion of the Ozone Strategy addressing national ozone planning requirements will include (1) a redesignation request and (2) a maintenance plan to show that the region will continue to meet the 1-hour ozone standard.

In addition, the California Clean Air Act requires the BAAQMD to update the Clean Air Plan for attaining the state 1-hour ozone standard every three years. The BAAQMD Board of Directors adopted the most recent update in December 2000. The portion of the Ozone Strategy addressing state ozone planning requirements will include the triennial update to the region's strategy to attain the state 1-hour ozone standard. In September and October 2004, the BAAQMD convened a series of community meetings throughout the Bay Area to describe the draft control measures proposed for the Ozone Strategy and to invite public input. The draft Ozone Strategy, including proposed control measures, is expected to be released for public review in 2005.

City of Vallejo

Locally, Vallejo has adopted an air quality element as part of the City's General Plan. The air quality element includes several policies to support the City's air quality goals, which include the reduction of air quality effects associated with future development in Vallejo and a contribution toward improving regional air quality.

Environmental Consequences

Standards for Determining Significance under NEPA

National Environmental Policy Act (NEPA) criteria for determining significance are listed in 40 CFR 1508.27, but are considered more broad and less stringent than CEQA criteria, set forth below. Also, the CEQA criteria below incorporate NEPA standards. For these reasons, identification of impacts as significant under CEQA is treated herein as sufficient for identifying impacts considered significant under NEPA. Mitigation measures set forth to minimize CEQA significant impacts are presumed to also mitigate NEPA significant impacts. These assumptions are made only for the purpose of identifying the magnitude of particular impacts; this document complies with NEPA requirements and uses the CEQA analysis only as a source of supporting information.

Criteria for Determining Significance under CEQA

The State CEQA Guidelines and BAAQMD's CEQA guidelines were used to determine whether the proposed action would have significant air quality effects. According to the State CEQA Guidelines, a project may be considered to have a significant environmental effect if it would

- conflict with or obstruct implementation of air quality plan,
- violate air quality standards,
- contribute a cumulatively considerable net increase of a criteria pollutant in a nonattainment area,
- expose sensitive receptors to substantial pollutant concentrations, or
- create objectionable odors affecting a substantial number of people.

BAAQMD's *CEQA Guidelines for Assessing the Air Quality Impacts of Projects and Plans* (Bay Area Air Quality Management District 1999) establishes significance criteria based on daily emissions, or on annual emissions from the operation of projects, and the effects of projects on traffic conditions.

The air quality effects of a project located in BAAQMD jurisdiction are considered significant if they would do any of the following.

- Emit 15 tons or more per year (tpy) of PM10, NO_x, ROG, or VOC.
- Emit 100 tons or more per year of CO or SO_x.
- Cause a net increase in pollutant emissions of 80 pounds per day (ppd).
- Cause a net increase in CO emissions exceeding 550 ppd, reduce roadway LOS of intersections operating at LOS E or F, cause a reduction of intersection LOS to E or F, or increase traffic volumes on nearby roadways by 10 percent or more, and violate state CO standards as determined by the modeling of CO emissions. The level of significance of CO emissions from mobile sources is determined by modeling the ambient CO concentration under project conditions and comparing the resultant 1- and 8-hour concentrations to the respective state CO standards of 20.0 and 9.0 ppm.

Methods and Assumptions for the Effect Analysis

BAAQMD has jurisdiction over air quality issues within the SFBAAB portion of Solano County. As such, projects in that area are assessed using BAAQMD's significance criteria.

Construction Impact Assessment Methods

BAAQMD does not require quantification of construction emissions. Instead, it requires implementation of effective and comprehensive feasible control measures to reduce PM10 emissions (Bay Area Air Quality Management District 1999). PM10 emitted during construction activities varies greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, and weather conditions. Despite this variability in emissions, experience has shown that there are several feasible control measures that can be reasonably implemented to reduce PM10 emissions during construction. These control measures are aimed at controlling PM10 emissions and are summarized in Table 3.6-4. According to BAAQMD, if all control measures indicated in Table 3.6-4 are implemented (as appropriate, depending on the size of the action area), air pollutant emissions from construction activities are considered less than significant (Bay Area Air Quality Management District 1999). Accordingly, the control measures have been incorporated into the proposed action as environmental commitments listed in Chapter 2.

Although the BAAQMD CEQA Guidelines do not specifically require quantification of construction emissions, because this is a large project with potentially significant constructions emissions and because the conformity analysis for NEPA requires the review of indirect emissions including vehicle exhaust and fugitive emissions associated with construction, construction emissions have been quantified. Constructions emissions were estimated using EPA Ap-42 emission factors, emissions factors ,and data from the EMFAC 2002 emission factor model and information prepared for the SCAQMD (South Coast Air Quality Management District 1993, Midwest Research Institute 1995).

Construction of the project would generate emissions of ROG, NO_x, CO, SO_x, and PM10. Construction-related emissions would include fugitive PM10 dust from levee construction and crust management activities and exhaust emissions resulting from worker commute trips and mobile and stationary construction equipment. A large portion of the heavy-duty construction equipment would be diesel-fueled.

Operational Impact Assessment Methods

Operational emissions for the project were estimated using the applicable emission standards in California Code of Regulations, Title 13 for the portable equipment, including the pumps and engines associated with the hydraulic unloader. A variety of hydraulic unloading equipment, barges and tugboats may use the facility, and actual emissions would vary with the size and duration of unloading activities. However, representative equipment was used to estimate emissions including a diesel powered hydraulic unloader with a typical engine size rated at about 2,500 HP, and a 500 HP engine for auxiliary power and support. Similar unloading equipment has been used for past dredging projects throughout the Bay Area.

For the purposes of this analysis, several operational assumptions were made involving the size of equipment, the duration of operations on a daily and annual basis, and the quantity of material to be handled. Hydraulic off-loading and mechanical off-loading are the two basic operating scenarios evaluated in this analysis.

Hydraulic Off-Loading

The off-loader pump is assumed to have a 2,500-HP diesel generator, although an electric pump may be used when required. The off-loader would be operated an average of 10 hours per day to off-load 8,000 cy. The hydraulic off-loader work platform would also have a 500-HP diesel generator for auxiliary power and there could be a 6.5-HP generator for lighting on Pier 35.

An estimated average of 421,100 cy would be hydraulically off-loaded annually, and off-loading would occur an estimated average of 50 days per year over the 20-year project life. Typically, individual projects or disposal events would produce an estimated 8,000 cy per day, although under good working conditions (soft material, deep bank, no down time), disposal could be as much as 9,000 to 12,000 cy per day. Depending on the scow size, 1 to 3 barges would be brought to the hydraulic off-loader west of Pier 35 daily during disposal events and a tug would assist with arrival and departure maneuvering. Over the 20-year project life, large disposal events could result in up to 1.5 million cubic yards (mcy) being off-loaded over 188 days during the year. This event would represent the maximum potential annual emissions. These assumptions represent on-going emissions from operations over the life of the project. The 1.5 mcy placement event is considered a large event for the DMD and substantially exceeds the 20-year annual average for placement. However, this figure was used in the emissions calculations to represent maximum potential emissions from project.

The project description also includes a one-time placement event of up to 2.9 mcy during the 20-year project life. However, this event is unlikely to occur and is speculative at this time. Furthermore, these emissions would not represent recurring emissions that the operation emission thresholds were developed to control. In the event that the 2.9 mcy placement event does occur, the emissions would be nearly twice the emissions presented in the operations emissions scenario. The dredging operations associated with this large placement event would require separate CEQA analysis and consultation with the BAAQMD. A mitigation measure is included to address these potential large placement events.

Mechanical Off-Loading

Dredged materials would be mechanically off-loaded from scows to sealed dump trucks using one 50-ton crane with clamshell dredge or similar device. The crane would be either land-based stationed ~~truck-mounted and work~~ from the pier or barge-mounted and stationed ~~work~~ adjacent to the dredged materials barge. A

Table 3.6-4. BAAQMD Feasible Control Measures for Construction Emissions of PM10

Basic control measures to be implemented at all construction sites
Water all active construction areas at least twice daily.
Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
Enhanced control measures to be implemented at construction sites larger than four acres in area.
Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)
Limit traffic speeds on unpaved roads to 15 mph.
Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
Replant vegetation in disturbed areas as quickly as possible.
Optional control measures, which are strongly encouraged for construction sites that are large in area, located near sensitive receptors, or for any other reason may warrant additional emissions reductions.
Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.
Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas.
Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.
Limit the area subject to excavation, grading and other construction activity at any one time.
Source: Bay Area Air Quality Management District 1999.

small work boat would be present to deploy silt curtains around the scow to minimize dredged material loss.

The crane is assumed to have a 365-HP diesel engine. The pier would include a 6.5-HP diesel generator for lights. Assuming that a 3-cy clamshell bucket and 20-cy ~~15- to 16-cy~~ dump trucks filled up to 16-cy are used, it would take approximately 14 ~~24~~ hours to off-load the dredged material into the dump trucks.

An estimated average of 42,750 cy would be mechanically off-loaded annually, and off-loading would occur an average of about 25 ~~14~~ days per year (18 days at 2,400 cy/day plus 7 contingency days) during the ~~20-year~~ project life. ~~(a total of 285 days over the life of the project).~~ Over the ~~20-year~~ project life, it is possible that an ~~-~~above average year would occur that could result in 150,000 cy mechanically off-loaded over 90 ~~50~~ days.

Typically, individual small projects or disposal events that would be off-loaded at Pier 34 would produce an estimated 2,400 ~~3,000~~ cy per day (based on the estimated annual average of 42,750 cy). Typical scows have a carrying capacity of 1,000 to 3,000 cy ~~for small jobs~~. For this analysis, it is assumed that two ~~three~~ barges would be brought to Pier 34 daily during disposal events, and a tugboat would assist with arrival and departure maneuvering.

Six ~~Up to eight~~ trucks w~~c~~ould be used to off-load mechanically dredged material. The loading time is assumed to be 5 minutes, assuming a 3-cy clam-shell bucket, ~~16~~ 20-cy dump truck capacity filled to 16 cy, and 1-minute loading cycle. Trucks would idle while loading or in the holding area. The trucks would travel at low speeds (i.e., 10 mph) while traveling between the pier and Pond 7. A total of 150 ~~188- 200~~ truck trips would occur over an approximately 14 ~~24-~~hour period. ~~For the purpose of this analysis, a maximum of 200 truck trips was used to calculate total emissions.~~

Effects

Effect 3.6-1: Increase in Construction-Related Emissions

Construction activities during levee-raising years (10- to 20-year period) would be accomplished using many types of construction vehicles and equipment. The actual number of vehicles and equipment in use on a given day would vary greatly as work at different portions of the site progresses.

Based on the project description, the levee-raising activities are expected to involve a maximum of 1.53 million cubic yards of earthwork for levee construction. The activity is estimated to involve three bulldozers, seven rubber-tired scrapers, one backhoe, three sheep's feet, one water truck used for controlling dust and conveying compaction water, and one pick-up truck. The actual number of water-spreading pieces of equipment would depend on how much compaction water could be directly applied through hoses and pipes.

Various other motor vehicles and equipment may also be in use intermittently at times during the levee-raising operation.

The simplest way to determine whether the anticipated volume of construction would cause significant air quality effects is to work backward from the significance threshold. The volume of construction that would be required to approach the air quality significance thresholds was calculated and then compared to the expected volume of construction. Table 3.6-5 presents the emissions expected if up to 1.53 mcy of levee construction were conducted per year. Not only do these emissions fall short of the significance thresholds, but construction using up to 1.53 mcy of material per year is unlikely, and would mean that little or no further levee raising would be necessary. Details of emissions calculations are provided in Appendix O. As also illustrated in Table 3.6-5, CO and VOC emissions from the maximum levee construction scenario would also be below the NEPA *de minimis* thresholds.

Construction emissions associated with levee raising would be short term, and would cease once levees are raised to their final height. Also, environmental commitments outlined in Chapter 2 would be implemented to reduce fugitive dust (PM10). These commitments are based on the BAAQMD recommendations listed in Table 3.6-4.

Table 3.6-5. Disposal Pond Construction Air Pollutant Emission Calculations

	Pollutant Emissions (Tons/Year)				
	CO	VOC	NO_x	SO_x	PM10
Significance criteria for Conformity	100	100	100	100	100
De minimis threshold	100	100	-	-	-
10 percent Solano County area inventory	1,278	4,380	-	-	-
Uncontrolled emissions from maximum levee construction of 1.53 mcy	48.62	8.48	95.66	6.28	99.96

No Action

There would be no construction-related air quality effects under this scenario. No mitigation is required.

Alternatives 1, 2, and 3

Construction-related effects would be temporary and periodic. This effect is potentially significant. Implementation of the following environmental commitments to reduce fugitive dust (PM10) would reduce this impact to a less than significant level. These measures are listed below and described in greater detail under "Environmental Commitments and Mitigation Measures" at the end of this Air Quality section.

- Environmental Commitment C-1: Implementation of BAAQMD Control Measures during Construction Activities.
- Environmental Commitment C-2: Ensure Levee Raising Activities Do Not Occur during the Same Year as Large Disposal Events.

Effect 3.6-2: Increase in Operation-Related Emissions

Operation emissions for the project include both indirect mobile source emissions and direct portable equipment emissions. Mobile emissions associated with project operation would be generated by haul trucks under the mechanical off-loading scenario and workers commuting; however, because the project would employ only a few workers, the emissions associated with commute trips would be negligible.

Hydraulic Off-Loading

The primary sources of emissions under the hydraulic off-loading scenario are the 2,500-HP engine used by the hydraulic off-loader and the 500-HP engine used by the auxiliary generator. Both of these emissions sources are subject to the registration requirements of the Statewide Portable Equipment program, which requires portable engines operated on a dredge to have a portable equipment registration and requires the appropriate on-shore air quality management district be notified when operating in their jurisdiction. In addition, recently adopted requirements of Title 13 require engines to retrofit or re-power with the more stringent 2005 Tier III engine standards containing not-to-exceed emissions factors for heavy duty diesel engines by January 1, 2005. These emissions standards are listed below in Table 3.6-6.

Table 3.6-6. Disposal Pond Operations Air Emission With Hydraulic Unloading Calculations

Hydraulic Off-Loading Operations Daily Emissions (ppd)

Emission Source	ROG	CO	NO_x	PM10
2,500-HP engine	10.5	135.0	185.2	7.7
500-HP Engine	2.1	27.0	37.0	1.5
Tug emissions	5.7	15.9	118.0	2.9
Total daily emissions	**18.3**	**178.0**	**340.2**	**12.2**
Significance threshold	80	550	80	80

Hydraulic Off-Loading Operations Annual Emissions (tons/year)

	ROG	CO	NO_x	PM10
2,500-HP engine	1.0	12.7	17.4	0.7
500-HP engine	0.2	2.5	3.5	0.1

Hydraulic Off-Loading Operations Annual Emissions (tons/year)				
	ROG	**CO**	**NO_x**	**PM10**
Tug emissions	0.5	1.5	11.1	0.3
Total annual emissions	**1.7**	**16.7**	**32.0**	**1.1**
Significance threshold	15	100	15	15

The unloading area is located within State Territorial Waters. Accordingly, the 2,500-HP hydraulic off-loader and the 500-HP generator cannot be operated absent authorization from the BAAQMD. The BAAQMD is entitled to impose more stringent requirements on the engines than are present in the existing permit, but they cannot impose *less* stringent requirements.

If the diesel-powered dredge to be used is a California registered source, any associated air emissions have already been analyzed as part of the environmental clearance for the statewide dredge source registration program. In addition, emissions associate with the operation of registered and permitted equipment within the District would be included in the District emissions inventory and planning process. Use of equipment that has a valid state operating permit will thus not cause "new" emissions that exceed the significance threshold.

The uncontrolled emissions initially presented in Table 3.6-7 in the Draft EIS/EIR corresponded to a maximum placement scenario of 3,000 cubic yards per day and operations 24 hours per day for mechanical offloading at Pier 34. This placement scenario would involve 200 truck trips, crane operations 24 hours per day, and up to 3 barge calls with associated tugboat emission. However, WESTON is proposing an additional environmental commitment that would limit mechanical unloading operations to 14 hours per day (between 7:00 a.m. and 9:00 p.m.). Refer to Environmental Commitment F-1 under "12. Environmental Commitments" (Final EIS/EIR, Volume I, Chapter 2). This environmental commitment would reduce the maximum mechanical dredge placement volume to 2,400 cubic yards per day. Total truck trips would be reduced to 150 trips per day, crane operations would be reduced to 14 hours per day, and the number of barge calls would be reduced from 3 to 2 calls. This commitment would have a corresponding reduction in daily air pollutant emissions. The revised emissions calculations for mechanical offloading are shown in the modifications to the table below.

The reductions reflected in the table do not reflect expected improvements over time as the technology improves. In addition, the U. S Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have proposed new engine standards that will reduce NO_x emission factors by 50% in the next three years. The current technology and associated emission reductions are described below.

Table 3.6-7. Revised Emissions Calculations for Mechanical Off-Loading

Mechanical Off-Loading Operations Daily Emissions Uncontrolled 14 hours per day (ppd)

	Emissions (ppd)			
Emission Source	**ROG**	**CO**	**NO_x**	**PM10**
Construction Vehicle Exhaust Emissions	12.4 ~~16.6~~	105.7 ~~141.5~~	77.1 ~~103.0~~	3.1 ~~4.1~~
Fugitive PM10				50.0
Haul Truck Emissions	0.6 ~~0.8~~	4.3 ~~5.7~~	6.0 ~~8.0~~	0.2 ~~0.3~~
Worker Commute Emissions	0.0	0.0	0.0	0.0
Tug Emissions	1.4 ~~3.4~~	3.9 ~~9.4~~	28.6 ~~69.9~~	0.7 ~~1.7~~
Total Emissions (ppd)	**15.5 ~~20.8~~**	**113.9 ~~156.7~~**	**111.7 ~~181.0~~**	**54.8 ~~56.1~~**
Significance threshold	80	550	80	80

Mechanical Off-Loading Operations Daily Emissions (ppd) with Technology or Control Based Mitigation

	Emissions (ppd)			
Emission Source	ROG	CO	NO_x	PM10
Construction Vehicle Exhaust Emissions	11.6	99.1	46.2	1.5
Fugitive PM10	-	-	-	50.0
Haul Truck Emissions	0.5	3.2	4.6	0.1
Worker Commute Emissions	0.0	0.0	0.0	0.0
Tug Emissions	1.4	3.9	28.6	0.7
Total Emissions (ppd)	15.5	111.7	79.4	52.4

Mechanical Off-Loading Operations Annual Emissions (tpy)

	Emissions (tpy)			
Emission Source	**ROG**	**CO**	**NO_x**	**PM10**
Construction Vehicle Exhaust Emissions	0.4	3.5	2.6	0.1
Fugitive PM10				1.3
Haul Truck Emissions	0.0	0.1	0.2	0.0
Worker Commute Emissions	0.0	0.0	0.0	0.0
Tug Emissions	0.1	0.2	1.7	0.0
Total Emissions (tpy)	**0.5**	**3.9**	**2.8**	**1.4**
Significance threshold	15	100	15	15

No Action

There would be no direct operation-related air quality effects under this scenario. However, because regional dredging sponsors may not have use of the Mare Island facility as a repository for unsuitable or combined suitable and unsuitable dredged material, development of a facility elsewhere in the Bay Area could ultimately be required. Lack of an available disposal facility could result in negative environmental impacts on the Bay Area because barges (which emit air pollutants) may have to travel farther to dispose of the dredged materials, and trucks would have to transport unsuitable material long distances to sanitary landfills, causing an increase in air pollution in the Bay Area.

Alternative 1

Emissions of ROG, CO, and PM10 do not exceed the total daily and annual significance levels. Only the total daily and annual NO_x emissions from equipment associated with operations under the hydraulic off-loading scenario exceed the significance threshold, and the majority of these emissions are associated with equipment that is subject to ministerial review and approval through the State Portable equipment program. The equipment that would be used for placement activities at the DMDF is currently operating within the BAAQMD under a portable equipment registration. This equipment is regulated by the individual registration as well as any project specific conditions imposed by the District at the time of operation. Because this equipment is already permitted and can operate within the State of California including the BAAQMD jurisdiction, the emissions are not considered to be from a new source. The regulation for the operation of this equipment was recently updated with stricter emissions standards. Operation of this equipment is considered a ministerial approval. These emissions do not represent a new source of emissions and are currently included in planning and emissions inventories for the BAAQMD.

Furthermore, the project includes an environmental commitment (see Environmental Commitment C-3) to use electric engines and off-loading equipment when practicable. Generally, the use of electric off-loading equipment would only be practicable on very large projects. However, those are the same projects that would have the highest air quality impact and require additional controls.

The emissions of ROG, CO, and PM10 do not exceed the total daily and annual significance thresholds. Only the NO_x emissions from operation of equipment associated with mechanical off-loading also exceed the daily significance threshold. However, due to the relatively few number of days of operation and the implementation of control technology including the use of emulsified diesel, annual significance thresholds are not exceeded. The total daily and annual emissions presented in this analysis represent the worst-case or maximum placement scenarios. Actual operations are expected to occur at a rate substantially below those presented in the assumptions and analysis. Actual emissions would therefore likely be lower than those presented in the analysis. However, under the maximum placement condition, total daily emissions do exceed the significance threshold for NO_x without control. Several emissions reductions technologies are available for use in equipment associated with the

mechanical off-loading scenario to reduce the impact to a less than significant level. These measures are listed in Mitigation Measure 3.6-1.

This impact is considered potentially significant. Implementing Environmental Commitment C-3 and Mitigation Measure 3.6-1 would reduce the impact to a less-than-significant level. These measures are listed below and described in greater detail under "Environmental Commitments and Mitigation Measures" at the end of this Air Quality section.

- Environmental Commitment C-3: Use Electrically Powered Off-Loader, When Practicable.
- Environmental Commitment F-1: Restrict Mechanical Off-Loading Activities at Pier 34 to Between the Hours of 7:00 a.m. to 9:00 p.m.
- Mitigation Measure 3.6-1: Implement Measures to Reduce Exhaust Emissions of NO_x and PM10 during Mechanical Off-Loading; and.
- Mitigation Measure 3.6-2: Consult with BAAQMD for All Placement Events Greater than 1.5 mcy and for All Other Placement Events where Daily Emissions or Total Annual Emissions Exceed Established BAAQMD thresholds and Implement Approved Emissions Reduction Programs or Offsets to Reduce Placement Emissions for These Events.
- Mitigation Measure 3.6-3: Require Dredging Contractors to Use Equipment with Valid Statewide Portable Equipment Registrations or to Obtain an Operating Permit from BAAQMD.

Alternative 2

Alternative 2 would have similar maximum daily and annual operational emissions. However, the operational life of the facility would be extended. Resulting in emissions occurring over a longer period of time. This impact is considered potentially significant. Implementing Environmental Commitment C-3 and Mitigation Measure 3.6-1 would reduce the impact to a less than significant level. These measures are listed below and described in greater detail under "Environmental Commitments and Mitigation Measures" at the end of this Air Quality section.

- Environmental Commitment C-3: Use Electrically Powered Off-Loader, When Practicable.
- Environmental Commitment F-1: Restrict Mechanical Off-Loading Activities at Pier 34 to Between the Hours of 7:00 a.m. to 9:00 p.m.
- Mitigation Measure 3.6-1: Implement Measures to Reduce Exhaust Emissions of NO_x and PM10 during Mechanical Off-Loading; and.
- Mitigation Measure 3.6-2: Consult with BAAQMD for All Placement Events Greater than 1.5 mcy and for All Other Placement Events where Daily Emissions or Total Annual Emissions Exceed Established BAAQMD Thresholds and Implement Approved Emissions Reduction Programs or Offsets to Reduce Placement Emissions for These Events.

- Mitigation Measure 3.6-3: Require Dredging Contractors to Use Equipment with Valid Statewide Portable Equipment Registrations or to Obtain an Operating Permit from BAAQMD.

Alternative 3

Alternative 3 would have similar maximum daily and annual operational emissions. However, the operational life of the facility would be extended, resulting in emissions occurring over a longer period of time. Haul truck emissions would be slightly higher than Alternative 1 due to the longer haul trip to the contiguous ponds rather than to Pond 7, as analyzed in Alternative 1. This impact is considered potentially significant. Implementing Environmental Commitment C-3 and Mitigation Measure 3.6-1 would reduce the impact to a less than significant level. These measures are listed below and described in greater detail under "Environmental Commitments and Mitigation Measures" at the end of this Air Quality section.

- Environmental Commitment C-3: Use Electrically Powered Off-Loader, When Practicable.
- Environmental Commitment F-1: Restrict Mechanical Off-Loading Activities at Pier 34 to Between the Hours of 7:00 a.m. to 9:00 p.m.
- Mitigation Measure 3.6-1: Implement Measures to Reduce Exhaust Emissions of NO_x and PM10 during Mechanical Off-Loading; and.
- Mitigation Measure 3.6-2: Consult with BAAQMD for All Placement Events Greater than 1.5 mcy and for All Other Placement Events where Daily Emissions or Total Annual Emissions Exceed Established BAAQMD Thresholds and Implement Approved Emissions Reduction Programs or Offsets to Reduce Placement Emissions for These Events.
- Mitigation Measure 3.6-3: Require Dredging Contractors to Use Equipment with Valid Statewide Portable Equipment Registrations or to Obtain an Operating Permit from BAAQMD.

Effect 3.6-3: Persistence of Barge and Truck Emissions

As discussed below, the proposed action would help to improve regional air quality by reducing barge travel time and eliminating truck transport to landfills for disposal of dredged material.

The Long Term Management Strategy (LTMS) has established that there are many regional environmental benefits to wetland disposal of dredged materials. The LTMS calls for balanced wetland and ocean disposal, and only minimal in-bay disposal. Because of the proximity of Mare Island to many dredging projects, emissions from tugboats transporting dredged material would be greatly reduced compared to other options, such as use of other disposal sites or ocean disposal. Because the material would not need to be trucked to landfills, further emission from land transportation would be avoided. Under the maximum annual scenario (whereby an unusually large, one-time project occurs), there

would be placement of 2.9 mcy of dredged material at Mare Island, which would generate NO_x emissions of less than 15 tons. This can be compared with the approximately 408.8 tons of NO_x emitted if the same amount of material is disposed of in a landfill and 355 tons if the material is disposed of in the ocean (see LTMS). Therefore, the proximity of Mare Island to regional dredging operations could produce an overall regional improvement in air quality.

No Action

This scenario would have a negative effect on the campus and housing development. The No Action Alternative would result in continued emissions from barges transporting dredged material over longer distances, as discussed. However, this effect is considered less than significant because it represents little change compared to existing conditions.

Alternatives 1, 2, and 3

This effect is considered beneficial. No mitigation is required.

Effect 3.6-4: Increase in Odor

The proposed action may generate odors during disposal and settling of dredged material. The proposed action may generate odors during disposal and settling of dredged material. Odor from sediment that is proposed for placement at Mare Island is typically generated by the presence of hydrogen sulfide that volatilizes from standing water and sediment. This production of hydrogen sulfide occurs naturally during the decay of organic material under anaerobic conditions. The dredged materials that are proposed for placement at this site are generally fine to coarse grained sands and silts which are obtained from maintenance or deepening dredge projects that are not typically from areas with large amounts of organic material. Also when sediments are dredged and otherwise handled as part of a dredging project, they are exposed to oxygen during the mixing processes and this helps convert the hydrogen sulfide that is present in the sediment to other, less odiferous compounds. Off-loading tends to further oxidize the sediments; therefore, little odor is anticipated to be generated by off-loading and dewatering processes at the Mare Island DMDF. The DMDF program includes crust management, which consists of physical modification of the drying solids to enhance evaporation or drainage, which would minimize the potential for regeneration of odor in the sediments. See Chapter 2, “DMDF Program Elements, 5. Dredged Material and Effluent Management – Solids.” It is anticipated that any odors generated from the disposal ponds would not be any more objectionable than the naturally occurring odors around the salt marsh.

No Action

There would be no odor-related effects under this scenario. No mitigation is required.

Alternatives 1, 2, and 3

This effect is considered less than significant. No mitigation is required.

Effect 3.6-5: Diesel Equipment Exhaust Health Risk

In August 1998, CARB identified particulate emissions from diesel-fueled engines (diesel PM) as toxic air contaminants. In September 2000, CARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce diesel PM10 emissions and the associated health risk by 75 percent in 2010 and by 85 percent by 2020. The plan identifies 14 measures that CARB will implement over the next several years. To the extent that the CARB measures are enacted before any phase of construction, the proposed project would be required to comply with applicable diesel control measures.

The assessment of cancer risk is typically based on a 70-year exposure period. Construction activities and off-loading and placement activities are sporadic, transitory, and short-term in nature, and once these activities have ceased, so too have emissions from the diesel equipment. Because exposure to diesel exhaust would be well below the 70 year exposure period, construction and operation of the proposed project is not anticipated to result in an elevated cancer risk to exposed persons due to the short-term nature construction-related diesel exposure. Furthermore, there are no sensitive receptors in close proximity to Pier 34 and Pier 35 where the majority of the diesel emissions would occur. Based on the substantial distances to the nearest receptors exposures would be substantially reduced. Consequently, the estimation of diesel risks associated with the operation of heavy equipment for construction and off-loading activities is considered to be less than significant.

No Action
There would be no diesel exhaust emission associated with this scenario. No mitigation is required.

Alternatives 1, 2, and 3
This effect is considered less than significant. No mitigation is required

Environmental Commitments and Mitigation Measures

Environmental Commitments

WESTON has made environmental commitments regarding air quality to avoid or minimize the effects of the action alternatives. These air quality commitments are incorporated into the project description and are detailed below.

Environmental Commitment C-1: Implement BAAQMD Control Measures during Construction Activities
BAAQMD has identified the following set of feasible control measures for construction activities. WESTON will ensure that all basic and enhanced control measures listed below will be implemented as part of the proposed action to

ensure that BAAQMD standards are met. Most of the optional control measures will also be implemented.

Basic control measures are the following.

- Water all active construction areas at least twice daily.
- Cover all trucks hauling (dry) soil, sand, and other loose material or require all trucks to maintain at least 2 feet of freeboard. Freeboard is the space between the top of the load and the top edge of the truck bed.
- Pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites
- Sweep daily, with water sweepers, all paved access roads, parking areas, and staging areas at construction site.
- Sweep streets daily, with water sweepers, if visible soil material is carried onto adjacent public streets.

Enhanced control measures (for construction sites larger than 4 acres) are the following.

- Implement all basic control measures listed above.
- Hydroseed or apply nontoxic soil stabilizers to inactive construction areas; i.e., previously graded areas inactive for 10 days or more.
- Enclose, cover, water twice daily or apply nontoxic soil binders to exposed stockpiles; e.g., dirt, sand, etc.
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

Optional control measures (for construction sites that cover a large area and are located near sensitive receptors, or which, for any other reason, may warrant additional emission reductions) are the following.

- Install wheel washers for all existing trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.
- Install windbreaks, or plant trees/vegetative windbreaks at windward sides of construction areas.
- Suspend excavation and grading activity when instantaneous gusts of wind exceed 25 mph.
- Limit the area subject to excavation, grading and other construction activity at any one time.

Environmental Commitment C-2: Ensure That Levee Raising Activities Do Not Occur during the Same Year as Large Disposal Events

WESTON will coordinate levee-raising activities and large off-loading projects so that they do not occur in the same year, to ensure that regional air quality will not be affected significantly. Monitoring will be performed to ensure compliance with these control measures. This function will be the responsibility of an onsite environmental compliance technician.

Environmental Commitment C-3: Use Electrically Powered Off-Loader, When Practicable

WESTON will require the dredging sponsor to use an electrically powered off-loader, when practicable. It is generally more practicable to use an electric off-loader on larger projects. Use of an electric off-loader will be confirmed with the appropriate electricity provider to ensure the existing electricity infrastructure can accommodate the electric off-loader. Island Energy is currently the major supplier of electrical power and natural gas for Mare Island.

Environmental Commitment F-1: Restrict Mechanical Off-Loading Activities at Pier 34 to Between the Hours of 7:00 a.m. to 9:00 p.m.

Mechanical off-loading activities at Pier 34, including the transportation of dredged material to the pond(s), would be restricted to between the hours of 7:00 a.m. and 9:00 p.m. When off-loading activities occur after dark, flagman will be used for truck movements instead of backup alarms. Implementation of this measure will not only reduce noise from offloading activities, but will also eliminate nighttime noise from trucking associated with offloading.

Mitigation Measures

Mitigation Measure 3.6-1: Implement Measures to Reduce Exhaust Emissions of NO_x and PM10 during Mechanical Off-Loading

WESTON will require contractors to implement the following measures to reduce exhaust emissions on on-road and off-road equipment used for mechanical off-loading, including cranes.

- Use alternative (low NO_x) diesel fuel in construction equipment. (Note: There is an alternative fuel purveyor on Mare Island.)
- Use lean NO_x catalyst or diesel oxidation catalyst.

Mitigation Measure 3.6-2: Consult with BAAQMD for All Placement Events Greater than 1.5 mcy and for All Other Placement Events where Daily Emissions or Total Annual Emissions Exceed Established BAAQMD Thresholds ~~can not be reduced below the significance thresholds identified on page 3.6-12 through the implementation of other identified mitigation measures or environmental committments~~ and Implement Approved Emissions Reduction Programs or Offsets to Reduce Placement Emissions for These Events.

For all disposal events that exceed 1.5 mcy and for all other placement events where daily emissions for total annual facility emissions exceed the significance threshold, WESTON will consult with the BAAQMD to determine required measures to reduce the impacts to less-than-significant levels. Established thresholds include the following: emit 15 tons or more per year (tpy) of PM10, NO_x, ROG, or VOC; emit 100 tons or more per year of CO or SO_x; cause a net increase in pollutant emissions of 80 pounds per day (ppd); or cause a net increase in CO emissions exceeding 550 ppd, reduce roadway LOS of intersections operation at LOS E or F, or increase traffic volumes on nearby roadways by 10% or more, and violate state CO standards as determined by the modeling of CO emissions. The level of significance of CO emissions from mobile sources is determined by modeling the ambient CO concentration under project conditions and comparing the resultant 1- and 8-hour concentrations to the respective state CO standards of 20.0 and 9.0 ppm. WESTON shall either require the contractor to obtain an air quality permit from the BAAQMD or WESTON shall contract with the District for emission reduction credits or funding for an emission reduction program. Emission Reduction Credits shall be provided by either leasing approved credits from the BAAQMD emissions reductions credit bank or by funding an emission reduction project that will provide equivalent emission reductions as approved by BAAQMD. WESTON will implement the BAAQMD-approved emissions reduction programs or offsets to reduce placements emissions during these events to a level considered less than significant by the BAAQMD.

Mitigation Measure 3.6-3: Require Dredging Contractors to Use Equipment with Valid Statewide Portable Equipment Registrations or to Obtain an Operating Permit from BAAQMD.

In the event that electric offloading equipment is not available, WESTON shall require dredging contractors to use equipment with a valid Statewide Portable Equipment Registration or obtain a permit from the BAAQMD for hydraulic unloading equipment to be used. In the event that the equipment is subject to the Portable Equipment Registration Program and has not previously operated in the Bay Area Air Basin and is not part of the planning inventory for the Bay Area Air Basin, then WESTON or the contractor shall provide emission reduction credits to reduce the project impacts to a less-than-significant level in accordance with Mitigation Measure 3.6-2.

Summary of Effects and Mitigation Measures by Alternative

Table 3.6-8. Summary of Air Quality Effects and Mitigation Measures

	Alternative 1	Alternative 2	Alternative 3	No Action
Air Quality				
Effect 3.6-1: Increase in Construction-Related Emissions				
Quantitative Comparison	Fugitive dust will be adequately controlled	Fugitive dust will be adequately controlled	Fugitive dust will be adequately controlled	No construction emissions
Significance before Mitigation	PS	PS	PS	NE
Significance after Mitigation	LS	LS	LS	NE
Mitigation Measures				
C-1: Implement BAAQMD Control Measures during Construction Activities	X	X	X	
C-2: Ensure Levee-Raising Activities Do Not Occur during the Same Year as Large Disposal Events	X	X	X	
Effect 3.6-2: Increase in Operations-Related Emissions				
Quantitative Comparison	Emissions would be above significance thresholds	Emissions would be above significance thresholds; slightly longer operational life	Emissions would be above significance thresholds; slightly longer operational life	No additional emissions
Significance before Mitigation	PS	PS	PS	NE
Significance after Mitigation	LS	LS	LS	NE
Mitigation Measures				
C-3: Use Electrically Powered Off-Loader, When Practicable	X	X	X	
F-1: Restrict Mechanical Off-Loading Activities at Pier 34 to Between the Hours of 7:00 a.m. to 9:00 p.m.	X	X	X	
~~Mitigation Measure~~ 3.6-1: Implement Measures to Reduce Exhaust Emissions of NO_x and PM10 during Mechanical Off-Loading	X	X	X	

	Alternative 1	Alternative 2	Alternative 3	No Action
Air Quality				
~~Mitigation Measure~~ 3.6-2: Consult with BAAQMD for All Placement Events Greater than 1.5 mcy and for All Other Placement Events Where Daily Emissions or Total Annual Emissions Exceed Established BAAQMD Thresholds and Implement Approved Emissions Reduction Programs or Offsets to Reduce Placement Emissions for These Events	X	X	X	
3.6-3: Require Dredging Contractors to Use Equipment with Valid Statewide Portable Equipment Registrations or to Obtain an Operating Permit from BAAQMD	X	X	X	
Effect 3.6-3: Persistence of Barge and Truck Emissions				
Quantitative Comparison	Reduction of emissions compared to other disposal options	Reduction of emissions compared to other disposal options	Reduction of emissions compared to other disposal options	Continued emissions from existing disposal methods
Significance before Mitigation	B	B	B	LS
Significance after Mitigation	B	B	B	LS
Mitigation Measures				
None required None available	X	X	X	X
Effect 3.6-4: Increase in Odor				
Quantitative Comparison	Minimal odors	Minimal odors	Minimal odors	No additional odors
Significance before Mitigation	LS	LS	LS	NE
Significance after Mitigation	LS	LS	LS	NE
Mitigation Measures				
None required None available	X	X	X	X
Effect 3.6-5: Diesel Equipment Exhaust Health Risk				
Quantitative Comparison	Minimal risk	Minimal risk	Minimal risk	No additional risk
Significance before Mitigation	LS	LS	LS	NE
Significance after Mitigation	LS	LS	LS	NE

	Alternative 1	Alternative 2	Alternative 3	No Action
Air Quality				
Mitigation Measures				
None required None available	X	X	X	X

Notes:

SU = Significant and unavoidable.
S = Significant.
PS = Potentially significant (same as significant for CEQA and NEPA purposes).
LS = Less than significant.
NE = No effect.
B = Beneficial.