

Section 3.3

Water and Sediment Quality

Introduction

This section identifies and evaluates issues related to the quality of the water and sediment in the action area.

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 current composition of the pond sediments is described in the setting because the action could change sediment quality.

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

Hydrology and Water Quality

The proposed action is located in the San Francisco Bay Area, which has cool, wet winters and warm, dry summers. The majority of the annual precipitation (rain) falls between November and March, with approximately 30 inches of rainfall per year. For the action area, the 10-year 24-hour estimated precipitation amount (i.e., the maximum amount expected in any 24-hour period during a 10-year timeframe) is approximately 3.5 inches. The 100-year 24-hour precipitation amount is approximately 5 inches (Western Regional Climate Center 1973).

Hydrology

Surface Water

Surface waters on Mare Island are composed of tidal and nontidal wetlands. Historically, sediment loads from the Napa, Sacramento, and San Joaquin Rivers settled out along the western shoreline of Mare Island. Extensive tidal marsh and mudflats formed from this sediment contribution. Construction of Dike 12 on the southern portion of the island in 1907 served to expand the mudflats along the western shoreline.

The disposal ponds were built on the historical salt marsh and accreted land. The pond surface in seven ponds is managed (by annual or more frequent disking) to prevent the recolonization of wetland plants and animals. However, seasonal ponding occurs in almost all of the ponds due to irregularities in bottom topography created by annual pond management activities and due to a broken (stuck in closed position) weir in one pond.

Groundwater

Three water-bearing zones (shallow, intermediate, and deep) are also found on the island. Shallow groundwater is present within the layers of artificial fill (~~that~~ varies in thickness from 0.5 to approximately 8 feet) and the natural unconsolidated deposits. However, shallow groundwater is discontinuous and was not found at the pond boundaries (it may occur within the ponds if there are any coarse-grained pockets present). Intermediate and deep groundwater zones are associated with the intermediate and lower sand units at the site. Shallow groundwater flow tends to be fairly consistent with respect to direction. In the vicinity of the disposal ponds, groundwater tends to flow toward San Pablo Bay. Intermediate and deep groundwater typically flows west or northwest.

The artificial fill unit in the disposal ponds consists primarily of silts, clays, and sands, with some areas of gravel, cobble, and debris. As dredged material was hydraulically discharged to the ponds, sediment and debris ~~was~~ were initially distributed within the pond based on particle size, settling properties, and discharge locations. Coarse-grained material (gravel, cobble, debris) fell out in the immediate vicinity of the discharge point because of its greater density. Finer-grained material was more widely distributed in the ponds because of its ability to stay suspended in the water column and undergo differential settling based on hydrologic patterns set up by the energy from the discharge pipe, water depth, and wind and weather patterns. The finest material (i.e., silts) settled out last, usually during quiescent periods (e.g., after cessation of dredged material discharge). Subsequent grading by heavy equipment to maintain drainage within the ponds served to mix these materials together. The areas where coarse-grained material deposited may have greater permeability in terms of groundwater infiltration and flow; however, these pockets are expected to be small due to the grading for drainage and borrowing of dredged material to construct berms. Consolidated silts and clays have much lower permeability and may act as an aquitard (a relatively impermeable barrier) where they form a contiguous layer in the pond.

Groundwater can be encountered in the ponds at ground surface to about 6.4 feet below ground surface (bgs); however, few wells actually encountered shallow groundwater. Groundwater in the shallow water-bearing zone exhibits some seasonality in elevation, varying more than 6.1 feet in an annual hydrologic cycle. Flow direction may also vary between wet and dry seasons, but typically travels towards San Pablo Bay.

As part of the H-1 landfill remediation, a subsurface slurry wall was constructed to isolate groundwater associated with the landfill ~~has been isolated~~ from the surrounding area (including the dredged material disposal ponds). Groundwater quality monitoring has been conducted since installation of the wall, and these data will be used by the agencies to assess the performance of this remedy. ~~and no longer has any potential influence on shallow groundwater quality.~~

Groundwater tends to show little tidal influence. Groundwater monitoring wells are located in the action area, and only the wells nearest the shoreline (within 50 feet) show significant changes in elevation (fluctuations of more than 0.1 feet). Overall, tidal movement is not expected to alter groundwater flow patterns or groundwater elevations within the Dredged Material Disposal Facility (DMDF).

Flooding

Low-lying portions of Mare Island within the action area are subject to flooding during extremely high tides or extreme flows on the Napa River. Flood likelihood is assessed against an area's mean lower low water (MLLW) level. MLLW is a base level that varies locally according to long-term measurements of tidal heights. A flood inundation study, based on existing data, was conducted for the Mare Island Master Plan (U.S. Navy 1989) which considered the potential effects of tides, storms, and high river flows on flooding on Mare Island. (The study did not assess the potential effects of wave runup, land subsidence, or global sea level rise.) This study indicated that areas below 8.8 feet above the MLLW may be subject to inundation during 100-year flood events. In the Mare Island area, MLLW is approximately 2.6 feet below mean sea level (msl). As mapped in the Naval Reuse Environmental Impact Report/Environmental Impact Statement (Navy and City 1998), the disposal ponds are protected from 100-year floods by levees; however, the access roads and pipeline alignments in the southern portion of the action area would be located within the 100-year floodplain.

The U.S. Army Corps of Engineers (Corps) has estimated 10-, 100-, and 500-year high tides at various stations around San Francisco Bay (Bay). A study indicates that the 10-year high tide in the Mare Island area is 8.3 to 8.4 feet above MLLW, the 100-year high tide is 8.8 to 8.9 feet above MLLW, and the 500-year high tide is 9.1 to 9.2 feet above MLLW, not taking into account additional effects of high river flows, tsunamis, wave runup, land subsidence, or sea level rise (Navy and City 1998). The record high tide on February 13, 1938 was approximately 9.4 feet above MLLW. Wave runup on the order of several feet is not uncommon for storms in the region. These factors would increase flooding potential during periods of high tides.

Sea Level Rise and Land Subsidence. A rise in sea level or land subsidence (relative sea level rise) would exacerbate flooding in low-lying areas of Mare Island. Sea level has been rising since the close of the last ice age, and the rise in sea level has accelerated in the past 25 years.

Estimates of sea level rise from now to the year 2100 range from 1 to 11 feet. It is anticipated that, although the rate of rise in the next 15 years will be gradual and close to historic rates, the rate may accelerate dramatically in subsequent years (San Francisco Bay Conservation and Development Commission 1987). Estimates indicate a rise in sea level of about 1.3 feet in the Mare Island area by 2036. The U.S. Environmental Protection Agency's (EPA's) projection of sea level rise indicates that, by 2006, there is a 50 percent chance that sea level will rise 6.24 inches by 2050 and another approximately 6 inches by 2075 (EPA 1995).

The area between Benicia and Sonoma Creek has shown a subsidence rate ranging from no subsidence to 0.0055 feet per year. Over 100 years, the 0.0055 feet per year figure would equate to about 6 inches of subsidence. Subsidence at Mare Island may be less than at Benicia.

The combined effects of subsidence and sea level rise would increase the 100-year flood elevations from the current 8.8 feet above MLLW to more than 10 feet above MLLW by 2036. The addition of 2 feet of wave runup results in a potential effective flood elevation of about 12 feet above MLLW (14.6 feet above msl) at bayfront areas of Mare Island.

Water Quality

Surface Water Quality

The surface water quality in the action area is characterized by several large bodies of water surrounding Mare Island. The Napa River, Mare Island Strait, Carquinez Strait, and San Pablo Bay are classified as impaired under Clean Water Act (CWA) Section 303(d). The Napa River is considered impaired because of sedimentation, pathogens, and nutrient loads. The water quality in both Carquinez Strait and San Pablo Bay is considered limited because of the presence of exotic species and the following substances: chlordane, dichlorodiphenyltrichloroethane (DDT), diazinon, dieldrin, dioxins and furans, mercury, polychlorinated biphenyls (PCBs), dioxin-like PCBs, and selenium. The majority of these contaminants are identified as resulting from nonpoint-source pollution, although ballast water, industrial point sources, municipal point sources, resource extraction, atmospheric deposition, agriculture, and natural sources are also cited for certain contaminants.

Surface water quality for ponded water in the disposal ponds varies depending on the amount of rainfall. Constituents in the pond water become more concentrated with extended evaporation periods and more dilute with periods of rainfall. As part of the Mare Island remedial investigation, Tetra Tech/EMI collected a single set of water quality samples in summer 1997 (WESTON 2002b). Most ponds were dry at that time, but standing water was found in Pond 4N. Because of the

lack of surface water in the disposal ponds, sediment elutriates (water decanted from a laboratory soil/water mixture) were used to estimate water quality when the ponds are inundated. Inorganic constituents (arsenic, copper, lead, mercury, nickel, and zinc) exceeded chronic marine ambient water quality criteria as established by EPA in less than 25 percent of the samples. Exceedance factors (sample concentration divided by the applicable criterion) ranged from 6 (lead, zinc) to 73 (copper). Maximum concentrations were associated with sediment elutriates from Pond 3W, which has since been remediated to remove metal “hot spots,” as defined by exceedances of EPA Region IX Preliminary Remediation Goals (PRGs—risk-based concentrations that are preliminary remediation goals for individual chemicals).

Organic compounds (specifically PCBs, alpha and beta-BHC [hexachlorocyclohexane], 4-methylphenol, and two phthalates) were only detected in one or two samples (primarily in Pond 4N). Pond 4N received drainage from the historical landfill that ~~is currently being~~ has since been remediated and from freshwater wetlands adjacent to the landfill that are treated seasonally to control mosquitoes. Water quality criteria are not available for most of these contaminants, with the exception of the phthalates. Exceedance factors for ~~those contaminants~~ phthalates were on the order of 3 times their respective criteria.

Groundwater Quality

Groundwater investigations were conducted as part of the Mare Island remedial investigation (~~Tetra Tech/EMI-2000~~ WESTON 2002b). Water quality samples were collected during multiple sampling events between 1992 and 1998.

A review of the available groundwater data and information was conducted to identify any effects on the groundwater beneath disposal ponds and the adjacent tidal marsh. Groundwater sampling data from permanent monitoring wells, piezometers, and grab sample (single groundwater sample collected for the purpose of siting a well) locations collected prior to the construction of the slurry wall surrounding the landfill were reviewed as discussed in the following paragraphs.

Of the two permanent monitoring wells and 22 groundwater grab samples that were collected from the disposal ponds and adjacent tidal marsh locations in the shallow water-bearing zone, only three grab samples from the disposal ponds (1 and 3W) revealed constituents (vanadium, selenium, antimony, and hexavalent chromium) at levels exceeding their respective groundwater screening criteria. Although detected above applicable screening levels, the levels of these individual metal constituents were not observed to be significantly higher than ambient background levels for these elements. A limited number of inorganic and organic constituents were detected in the two permanent monitoring wells at low levels, but were not consistently detected in routine monitoring events and are not considered representative of groundwater quality.

Samples exceeding the screening criteria were collected southwest and north of the historical landfill area that borders the ponds. Review of the distribution of hexavalent chromium in the shallow water-bearing zone indicated that this

contaminant was limited to one location that may have been affected by sources in or adjacent to the historical landfill, which is immediately upgradient. This conclusion is supported by the fact that hexavalent chromium was not detected in an immediately downgradient grab sample.

The presence of antimony, vanadium, and selenium at two other sampling locations can also be attributed to upgradient sources. These three constituents have been historically detected in shallow groundwater at significantly higher levels in several monitoring wells and grab samples collected in and around the landfill area. The landfill area is located directly upgradient from the disposal pond grab sample locations. Additionally, shallow piezometer groundwater samples collected in the same general area as the grab sample locations did not detect any constituents in excess of applicable screening criteria.

Based on the analytical results of all groundwater samples collected from in and immediately around the historical landfill area, the impermeable silty clay, which separates the artificial fill and shallow water-bearing zone from deeper water-bearing sand units, appears to have effectively prevented the downward migration of contaminants from landfill sources. This conclusion is supported by pump test data from the landfill area, which confirmed a lack of hydraulic connection between the shallow water-bearing zone and the intermediate/deep zones, and the overall distribution of target compounds in the three water-bearing zones. No contaminants of concern were identified for the intermediate and deep water-bearing zone groundwater during the remedial investigation for the historical landfill (WESTON 2002a).

Based on available data and information, it can be reasonably concluded that the disposal ponds do not appear to have affected the underlying groundwater. Also, they do not appear to be the source of the limited amount of metals detected in scattered groundwater samples from areas directly down gradient of the landfill. Construction of a low permeability slurry wall around the H-1 landfill ~~has served~~ will serve to further isolate the landfill from the ponds and ~~has thus limited~~ limit the transport of any constituents from higher concentration locations in the vicinity of the landfill to areas with lower concentrations (in the ponds).

More recent data collected to establish baseline conditions prior to operation of the D MDF further confirms that groundwater quality has not been degraded from either the H-1 landfill or historical operations with the ponds. Only metals have been detected in the four quarterly rounds of sampling, and the maximum concentration for all chemicals—except mercury and copper—have been below marine chronic criteria. Mercury and copper slightly exceed their respective criteria (the maximum mercury concentration in the shallow groundwater was 0.07 ug/L [the criterion is 0.05 ug/L] and the maximum copper concentration was 3.2 ug/L [the criterion is 3.1 ug/L]).

~~Data collected as part of the groundwater investigation were also used to determine whether any beneficial uses for groundwater from the site could be identified. Based on high total dissolved solids, brackish conditions, and low production/recharge rates, the groundwater underlying the disposal ponds does not meet the San Francisco Bay Regional Water Quality Control Board's criteria~~

~~for beneficial use for various water supply options (municipal and domestic, industrial process, industrial service, and agricultural) or recharge to fresh water surface waters.~~

Sediment Quality

Regional Setting

The Long-Term Management Strategy (LTMS) EIS/EIR identified reduction of in-bay open-water disposal as a key factor in the restoration and long-term protection of San Francisco Bay's natural resources and human health. The use of the Mare Island historical disposal ponds for the confinement of sediment from San Francisco Bay is proposed as part of the regional management of dredged material that may be suitable or unsuitable for open-water disposal.

Typical material that could be disposed of at the Mare Island facility includes sediment dredged for navigation and operation of public and private channels, waterways, and slips or berths. Sediments requiring remediation under state and federal regulations could also be considered for confined disposal, if they were not hazardous waste and did not contribute to the degradation of water quality following disposal.

Sediment from future dredging projects will tend to reflect the historical activities and practices that took place in the immediate area from which the sediment is dredged. The level of contamination in San Francisco Bay ranges from slightly above ambient conditions to being classified as hazardous waste. It is currently estimated that as much as 95 percent of the material tested is suitable for unconfined aquatic disposal (SUAD), less than 5 percent is unsuitable for unconfined aquatic disposal (NUAD), and less than 1 percent is hazardous (Laurel Marcus & Associates et al. 2000).

The dredged material that may be disposed of at the Mare Island facility is anticipated to be a combination of sediments that are unsuitable for open-water disposal and cleaner materials. However, no hazardous wastes would be accepted at the site.

Action Area

Originally, the area occupied by the disposal ponds was part of the tidal wetlands created by deposition of large sediment loads from the Napa and Sacramento Rivers in San Pablo Bay. Construction of Dike 12 along the southern shore of the island in 1908 accelerated the deposition of material along the western shoreline of Mare Island, creating extensive mudflats and vegetated tidal wetlands.

The U.S. Navy has dredged the berths and pier front along Mare Island Strait since 1892 to maintain access to its slips and berths at the Mare Island Naval

Shipyard. Dredged material was initially disposed in the Carquinez Strait. In the 1930s, the U.S. Navy began hydraulically transporting dredged material from the strait to two large bermed impoundments along the western shoreline. Over time, this disposal facility was expanded westward into the accreted wetlands.

As dredged material was discharged to the ponds, it was allowed to settle for several days or weeks before the overlying water was discharged in the tidal wetlands west of the ponds via weirs or small discharge pipes. Discharges were regulated to minimize the amount of suspended solids discharged to the Bay (i.e., to have no visible plume). As ponds were filled to capacity with settled solids, they were allowed to dry. Dewatered sediments were reused as construction material when raising the pond berms or creating new berms.

The U.S. Navy ceased disposal of dredged material in 1994. Seven of the ponds (2N, 2M, 2S, 4N, 4M, 4S, and 7) continue to be managed by WESTON to prevent recolonization of the pond surface by wetland plants and animals, in anticipation of continued use as dredged material disposal ponds. The remaining ponds (1, 8, 9, 3W, and 3E) have been allowed to revert to seasonal wetlands. Ponds 8 and 9 are the site of a large tidal wetland constructed by the Navy for salt marsh harvest mouse habitat. The U.S. Navy has transferred the majority of these properties to the State Lands Commission (SLC) or the City of Vallejo as part of the Base Reuse and Closure Act (BRAC) process. The SLC has leased the seven ponds to the City of Vallejo for the development of a future commercial dredged material disposal facility. The SLC had originally intended to transfer Ponds 1, 3W, and a portion of 3E to the USFWS; however, it is now considering transferring the area to the City for other uses as yet to be determined. Sediment quality in the ponds reflects the quality of material that was dredged from the U.S. Navy's berths and slips along Mare Island Strait. As part of the remedial investigation of the former naval shipyard (Tetra Tech/EMI 2000, WESTON 2002b) and several earlier studies, both surface (more than 100 samples) and subsurface (more than 300 samples) sediments from disposal ponds and dredged material from the levees (about 30 samples) have been collected from the project area. These samples were analyzed for inorganic and synthetic organic constituents. A summary of the chemical characteristics of the material that was historically disposed of at Mare Island presented in Table 3.3-1.

Regulatory Setting

A variety of federal, state, and local agencies have jurisdiction over the action area. Regulations of agencies and statutory authorities relevant to water quality and flooding are outlined below.

Federal Regulations

Clean Water Act

The CWA (Title 33 United States Code [USC] Sections 1251–1376), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” Important applicable sections of the act are as follows.

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 states that, for any activity that may result in a discharge to waters of the United States, applicants for federal permits must obtain certification from the state that the discharge will comply with other provisions of the act. Certification is provided by the Regional Water Quality Control Board.
- Section 404 establishes a permit program for the discharge of dredged or fill material (including decant waters) into waters of the United States. This permit program is administered by the Corps. Discharge of dredged and fill material into waters of the United States is discussed in detail in Section 3.4, “Biological Resources.”

Table 3.3-1. Characteristic Values for Mare Island Dredged Material

	Dredged Material 50 th Percentile	Dredged Material Upper 99 th Percentile
Inorganic Elements (mg/kg)		
Arsenic	15	37.9
Cadmium	0.7	7.2
Chromium	94	217
Copper	76	249
Lead	39	292
Manganese	872	4,818
Mercury	0.49	1.4
Nickel	100	149
Selenium	1.2	3.4
Silver	0.54	3.7
Zinc	156	595
Organic Compounds (mg/kg)		
Total PAHs	0.1	0.8
Total DDTs	0.005	0.6
Total PCBs	0.03	0.5
Total Chlordanes	0.0004	0.007
Dieldrin	0.0004	0.005

mg/kg = milligrams per kilogram.

PAH = polycyclic aromatic hydrocarbon

DDT = dichlorodiphenyl-trichloroethane

PCB = polychlorinated biphenyls.

Note: Total criteria are based on a sum of the detected values.

Source: ~~Weston~~ WESTON 2002 RI database.

Federal Flood Insurance Program

The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 were enacted to reduce the need for large, publicly funded flood control structures and disaster relief. The approach of these acts is to restrict development on floodplains.

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplain. FEMA issues Flood Insurance Rate Maps (FIRMs) for communities

participating in the insurance program. These maps delineate flood hazard zones in the community.

Executive Order 11988

Executive Order 11988 (Floodplain Management) addresses floodplain issues related to public safety, conservation, and economics. It generally requires federal agencies constructing, permitting, or funding to

- avoid incompatible floodplain development,
- be consistent with the standards and criteria of the National Flood Insurance Program, and
- restore and preserve the natural and beneficial floodplain values.

State Regulations

State Water Resources Control Board and Regional Water Quality Control Boards

The State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions throughout the state. The Regional Water Quality Control Boards conduct planning, permitting, and enforcement activities. The action area is located in the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB).

Beneficial Uses and Water Quality Objectives

The RWQCB is responsible for protecting the beneficial uses of water resources in the San Francisco Bay region. Beneficial uses are the desired resources, services, and qualities of the aquatic system that depend on high water quality. The RWQCB uses its planning, permitting, and enforcement authority to meet this responsibility, and has adopted the Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin (San Francisco Bay Regional Water Quality Control Board 1995) to implement plans, policies, and provisions for water quality management. Beneficial uses are described in the Basin Plan and are designated for major surface waters, their tributaries, and groundwater. The Basin Plan also contains water quality objectives intended to protect the identified beneficial uses. Water quality objectives are identified for the entire region and for specific bodies of water and beneficial uses.

Beneficial uses of the surface waters of the Napa River and Mare Island Strait include agricultural supply, cold and warm freshwater habitat, fish migration and spawning, municipal and domestic supply, navigation, preservation of rare and endangered species, water contact and noncontact recreation, and wildlife habitat. Beneficial uses of the surface waters of Carquinez Strait include commercial and recreational fishing, estuarine habitat, industrial service supply, fish migration and spawning, navigation, preservation of rare and endangered species, water

contact and noncontact recreation, and wildlife habitat. Beneficial uses of San Pablo Bay include commercial and recreational fishing, estuarine habitat, industrial service supply, fish migration and spawning, navigation, preservation of rare and endangered species, water contact and noncontact recreation, shellfish harvesting, and wildlife habitat.

Water quality objectives for all surface waters in the region have been set concerning bacteria, bioaccumulation, biostimulatory substances, color, dissolved oxygen, floating material, oil and grease, population and community ecology, pH, salinity, sediment, settleable material, suspended material, sulfide, tastes and odors, temperature, toxicity, turbidity, and ammonia.

Construction and Industrial Activity Permitting

The RWQCB administers the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program in the San Francisco Bay region for both construction and industrial activities. Construction sites disturbing one acre or more of land are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit). For qualifying projects, the project applicant must submit to the RWQCB a Notice of Intent (NOI) to be covered by the General Construction Permit before the beginning of construction. The General Construction Permit requires preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which also must be completed before construction begins. Implementation of the plan starts with the commencement of construction and continues through the completion of the project. Upon completion of the project, the applicant must submit to the RWQCB a Notice of Termination to indicate that construction is completed.

Stormwater discharges from industrial facilities are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities (General Industrial Permit). The regulations defining “storm water discharges associated with industrial activity” were published on November 16, 1990, with the EPA identifying 11 categories of industrial activities that are required to obtain permit coverage. To obtain authorization for continued and future stormwater discharge under the General Industrial Permit, each facility operator must submit an NOI. All stormwater discharges from industrial sites must meet all applicable provisions of Sections 301 and 402 of CWA. These provisions require control of pollutant discharges using the best available technology that is economically achievable and the best conventional pollutant control technology (BCT) to prevent and reduce pollutants and to meet water quality standards. These requirements are intended to ensure that stormwater discharges from an industrial site will not cause or contribute to a violation of all applicable water quality standards, which include all federal receiving water standards and all state standards under the Basin Plan. The General Industrial Permit generally requires facility operators to

- eliminate unauthorized non-stormwater discharges;

- develop, retain on site, and implement a SWPPP to identify sources of pollution and to prescribe implementation of best management practices (BMPs) to reduce or prevent pollutants in industrial stormwater discharges and authorized non-stormwater discharges; and
- perform monitoring of stormwater discharges and authorized non-stormwater discharges.

Areas of industrial activity where surface runoff must be controlled and treated include all storage areas and storage tanks, shipping and receiving areas, fueling areas, vehicle and equipment storage/maintenance areas, material handling and processing areas, waste treatment and disposal areas, dust or particulate generating areas, cleaning and rinsing areas, and all other areas of industrial activity that are potential pollutant sources. Any changes to the industrial site or activity require an update of the SWPPP and implementation of new control measures.

Waste Discharge Requirements

The State of California's Porter-Cologne Water Quality Control Act (California Water Code, Section 13000 *et seq.*) provides the basis for water quality regulation in California. The act requires a Report of Waste Discharge for any discharge of waste (liquid, solid, or otherwise), including dredged material, to land or surface waters that may impair a beneficial use of surface or groundwater. Waste discharge requirements (WDRs) resulting from the reporting process are issued by the Regional Water Quality Control Boards. WDRs also apply to the design, operations, and monitoring of the disposal facility.

The RWQCB will issue WDRs for the disposal of dredged material and discharge of resulting decant water at the Mare Island DMDF. WDRs will include chemical, physical and biological criteria that must be met at the point of discharge as well as the elements and decision criteria that will govern the long-term monitoring program for the facility. WDRs will also include acceptance criteria for the incoming dredged material.

Local Regulations

Vallejo Flood Damage Protection Ordinance

The City has enacted the Flood Damage Protection Ordinance as part of its municipal code (City of Vallejo 1992). This ordinance requires flood-proofing of any new structures or structures undergoing substantial improvements that are located in mapped flood areas. These improvements are subject to review and approval by the City's Department of Public Works.

Environmental Consequences

Standards for Determining Significance under NEPA

National Environmental Policy Act (NEPA) criteria for determining significance are listed in Title 40, Code of Federal Regulations (CFR), Section 1508.27 but are considered more broad and less stringent than California Environmental Quality Act (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

Hydrology and Water Quality

According to the State CEQA Guidelines and professional judgment, a project would result in a significant effect on water quality if it would

- violate any water quality standards or WDRs or otherwise substantially degrade water quality;
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted);
- substantially alter the existing drainage pattern of the site or area, which would result in substantial erosion, siltation, or flooding on site or off site;
- create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or FIRM or other flood hazard delineation map;
- expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of a levee or dam failure; or
- expose people or structures to a significant risk of loss, injury, or death as a result of inundation by seiche, tsunami, or mudflow.

Sediment Quality

According to the State CEQA Guidelines (for effects concerning hazardous materials and water quality) and professional judgment, a project would result in a significant effect on sediment quality if it would

- result in chemical concentrations in the sediment that are substantially different from baseline conditions, so that there is a significantly greater risk to human health and environmental receptors compared to existing risk;
- result in changes in sediment quality that would lead to violations of effluent limits (i.e., WDRs) at the point of discharge during operation of the disposal facility; or
- result in chemical concentrations in the sediment at the completion of the proposed action that would preclude beneficial reuse of the ponds following completion.

Methods and Assumptions for the Effect Analysis

Hydrology and Water Quality

Effects on Surface Water Quality

For effects related to dredged material placement, the region of influence with respect to surface water quality is the receiving water for the effluent—for the proposed action, San Pablo Bay). Degradation of receiving water quality would be considered substantial if chemical concentrations in the effluent exceeded the limits required by the RWQCB as part of the WDRs. In addition, receiving water quality would be considered substantially affected if sediment quality would degrade in the vicinity of the outfall.

Water quality in the ponds would vary over time and would be a function of whether or not dredged material is actively being discharged into a given pond and the quality of the dredged material. Many of the contaminants associated with dredged material, including PCBs, pesticides, and polycyclic aromatic hydrocarbons (PAHs), are considered *hydrophobic*, that is, they tend to bind to sediment particles instead of dissolving in water. Other contaminants, such as metals, are more hydrophilic (i.e., more easily dissolved into the water), particularly under aerobic (i.e., oxygenated) conditions. However, research conducted by the Corps Waterways Experiment Station regarding chemical mobility in dredged materials has shown that most chemical compounds in dredged material will maintain an association with the sediment particles. Some metals that occur in the dredged material may dissolve into the makeup water when hydraulically transported and discharged, but will reassociate with sediment during the settling and consolidation phases of dredged material management. As a result, the chemical concentrations of both hydrophobic and hydrophilic compounds in the dredged material decant water from the proposed

action would be directly related to the amount of sediment suspended in the water column.

Initial discharge of hydraulically transported dredged material would result in very turbid (typically 1,600 milligrams per liter [mg/l] of suspended solids) material being discharged into a pond. During periods of active discharge, the area in the immediate vicinity of the point of discharge would continue to be very turbid. Distant areas of the pond would be less disturbed and suspended solids would tend to settle out in these areas. It is anticipated that there would be a gradient in suspended solids concentrations horizontally across the pond and vertically through the water column, depending on the distance from the discharge weir and the depth of the ponded water. Suspended solids would settle out fairly rapidly upon discharge to a pond. Approximately 90 percent of the suspended material would settle out in the first 24 hours, and almost all the suspended material would be removed from the water column within a 2-week period. Once the water in the ponds has clarified, it would be tested to determine whether it should be released into the adjacent pond for additional settling or directed to the final discharge weir via one or more ponds. No discharge to receiving waters would occur until the effluent limits specified in the WDRs are met prior to release over the final weir.

Effluent quality from a confined disposal facility can be predicted based on the chemical and physical characteristics of the dredged material using guidance provided in Inland Testing Manual (EPA and USACE 1998). Dredged material acceptance criteria were used in a worst-case evaluation of compliance with effluent limits, using the following equation:

$$C_{\text{effluent}} = C_{\text{accept.crit.}} * \text{TSS}/10^6,$$

where

- C_{effluent} = total concentration in the pond effluent (parts per million [ppm]),
- $C_{\text{accept.crit.}}$ = the proposed acceptance criterion (milligrams per kilogram [mg/kg]) for a given chemical,
- TSS = total suspended solids concentration (50 mg/l), and
- 10^6 is a conversion factor for unit compatibility.

Results of this calculation are shown in Table 3.3-2. If all the sediments in the ponds are at concentrations equivalent to the proposed acceptance criteria, then exceedances of effluent limits for copper, lead, mercury, and total DDTs are predicted at the point of release from the disposal pond. Exceedances range from less than 2 to about 5 times the criterion (for metals) to up to 30 times the criterion (for DDT). This approach to predicting effluent quality overestimates the chemical concentrations in the decant water because it predicts the water quality at the first point of release (i.e., at the weir of the pond where disposal took place) and under worst-case conditions that may exist within the ponds. Worst-case conditions are as follows:

- dredged material is very fine-grained,
- initial settlement results in 50 mg/l TSS in the overlying water,
- material is disposed of at a rate of 70 cubic feet per second (cfs), and
- no dilution occurs at the point of discharge.

By virtue of the configuration of the six contiguous ponds, effluent from any one pond would have to pass through at least one other pond (if not two) to get to the final point of discharge in Pond 2N. This would serve to increase the retention time and further improve water quality prior to discharge to San Pablo Bay, as described below.

The flocculent column settling tests for Young Bay Mud from the Oakland Middle Harbor studies by Schroeder, Pranger and Wade (2000) report that TSS was reduced to about 15 mg/l after 2 weeks of settling. The quiescent conditions in the test column limit the final colloidal settling; field conditions would increase removal of colloids due to physical motion of the overlying water and reduce the suspended solids. In the same study, the authors stated that the TSS can be reduced to 5–10 mg/l for fine-grained material after a week of retention in a confined disposal facility.

Assuming that 10 mg/l TSS (from above) is achieved in the decant water during operations, water quality is greatly improved, as shown in Table 3.3-2. The resulting metals concentrations are below their respective criteria, and DDT about six times the standard, but within range as ambient conditions in San Pablo Bay. Table 3.3-3 reports ambient conditions based on data query of Regional Monitoring Program on-line water quality data from 1995 through 2002.

The proposed DMDF would accept material ranging from clean to levels up to near those in the acceptance criteria. “Clean” material refers to sediments that have been determined to be suitable for unconfined aquatic disposal. Water quality resulting from disposal of cleaner material is anticipated to meet all WDRs.

Conclusions

Actual effluent quality would be monitored on a regular basis, as required by the RWQCB, to ensure that effluent limits (WDRs) specified by the RWQCB are met. Monitoring would include analysis of conventional parameters (turbidity, dissolved oxygen, salinity, and temperature), chemical constituents, and the potential for biological effects based on laboratory bioassays.

Meeting effluent limits at the point of discharge is considered protective of sediment quality in the vicinity of the outfall. However, effluent may be more saline than receiving waters during some phases of operation (e.g., limited final drainage from dewatering). More saline water discharged during low tides may disrupt benthic communities in the vicinity of the outfall. To prevent this effect, effluent with salinity exceeding 30 parts per thousand (ppt) would be discharged only when the invert (bottom) of the outfall pipe is inundated by the tide (Note: 30 ppt is equivalent to the maximum salinity measured in San Pablo Bay water

column plus 5 ppt. It is highly likely that interstitial salinity in the mudflat regularly exceeds this during summer low tides.) This environmental commitment has been incorporated into the proposed action.

Table 3.3-2. Compliance with Effluent Limits for Material Meeting Acceptance Criteria

Chemical	Mare Island Sediments	Potential Effluent Quality		Proposed Effluent Limits (mg/l)
	Proposed Acceptance Criteria (mg/kg)	Effluent Quality Based on Worst-Case Conditions (mg/l)	Effluent Quality Based on Increased Retention Time (mg/l)	
Inorganics				
Arsenic	70	0.004	0.0007	0.036
Cadmium	9.6	0.0005	0.0001	0.0093
Chromium	370	0.019	0.004	0.05
Copper	270	0.014	0.003	0.0031
Lead	292	0.015	0.003	0.0081
Mercury	1.4	0.00007	0.000014	0.000051
Nickel	149	0.007	0.0015	0.0082
Silver	3.7	0.0002	0.00004	0.0019
Selenium	3.4	0.0002	0.00003	0.071
Zinc	595	0.03	0.006	0.081
PCBs/Pesticides				
PCBs	0.5	0.00002	0.000005	0.00003
Total DDT	0.6	0.00003	0.000006	0.000001
Total chlordane	0.007	0.0000004	0.00000007	0.000004
Dieldrin	0.005	0.0000002	0.00000005	0.0000019
PAHs				
Total PAH	44.8	0.002	0.0004	0.015

Note: Boxed figures indicate levels that would exceed the proposed effluent limits under worst-case conditions.

Table 3.3-3. Ambient Water Quality in the San Pablo Bay

	Ambient Water Quality Minimum Concentration	Ambient Water Quality Maximum Concentration
Inorganic Elements (mg/l)		
Arsenic	0.00119	0.00391
Cadmium	0.00001	0.00020
Chromium	0.00008	0.00879
Copper	0.00107	0.00477
Lead	0.000003	0.000991
Mercury	0.000001	0.000035
Nickel	0.00098	0.03741
Selenium	0.000035	0.000314
Silver	0.000001	0.000034
Zinc	0.0002	0.0084
Organic Compounds (mg/l)		
Total PAHs	0.0000006	0.000148
Total DDTs	0.0000001	0.000007
Total PCBs	0.0000001	0.000007
Total chlordanes	0.00000002	0.0000008
Diazinon	0.0000002	0.00004
Dieldrin	0.000000002	0.0000003

mg/l = milligrams per liter.

PAH = polycyclic aromatic hydrocarbon.

DDT = dichlorodiphenyl-trichloroethane.

PCB = polychlorinated biphenyls.

Note: Total criteria are based on a sum of the detected values.

Source: SFEI Regional Monitoring Program data query for San Pablo Bay
(www.sfei.org/RMP/report#).

Effects on Groundwater Quality

The region of influence for groundwater is the shallow groundwater zone underlying the ponds and underlying the proposed point of discharge to San Pablo Bay. Groundwater would be considered adversely affected if groundwater quality were significantly altered compared to existing conditions. Any degradation of sediment quality in the adjacent salt marsh resulting from contaminant transport via groundwater would also be considered significant.

Surface water in the ponds, when present, would percolate into the upper layer of the historical dredged material, where coarser-grained material is present. Most of this coarser material is expected to have settled near the point of historical discharge (although grading and borrowing have served to mix this material with other finer sediments). The majority of the dredged material in a given pond (both on the surface and at depth) is expected to be fine grained. In general, fine-grained material has very low permeability, once consolidated. Consolidated material tends to act as an aquitard and prevent infiltration of surface water into the groundwater. These low-permeability sediments are also expected to retard the movement of groundwater within the dredged material or through the berms (also constructed using historical dredged material).

Groundwater quality is unlikely to be altered from existing conditions because dredged material will be similar ~~or better~~ in quality to that historically discharged to the ponds. Shallow groundwater may discharge to the adjacent tidal wetlands; however, groundwater transport is anticipated to be slow, and shallow groundwater has only been infrequently encountered in the project area. In addition, sediment quality adjacent to the westernmost berms appears to be primarily influenced by the location of overflow weirs, rather than a nonpoint source such as groundwater seepage. In general, sediment quality in the tidal wetlands adjacent to the disposal ponds is high and does not represent a threat to ecological receptors, which suggests that groundwater and previous point-source discharges from the weirs does not affect sediment quality in the tidal wetlands. In addition, DTSC requires monitoring of the outboard marsh sediments near the toe of the berm as part of the Western Early Transfer Parcel agreements. Continued monitoring during the DMDF operations will be able to confirm the conceptual model that no contaminated groundwater is seeping out to the Area J Marsh, such that it represents a risk to ecoreceptors.

Sediment Quality

The study area for the analysis of sediment quality effects consists of the disposal pond area proposed for reuse. No sediments would be discharged to the adjacent tidal wetlands or to San Pablo Bay during operation of the disposal facility; therefore, it is assumed that sediment quality in adjacent environments would not be degraded. The sediment quality in the vicinity of the outfall would be protected through compliance with WDRs, and monitoring as described above.

Effects

Effect 3.3-1: Decreased Water Quality from Construction Activities

Construction activities introduce the potential for increased erosion and sedimentation, with subsequent effects on water quality and storm drain capacity. Additionally, fuels or other hazardous materials associated with construction equipment could affect water quality if released accidentally.

During site grading for levee-raising activities that will take place periodically throughout the project and during construction activities, areas of bare soil would be exposed to erosive forces. Bare soils are much more likely to erode than vegetated areas because of the lack of dispersion, infiltration, and retention properties created by covering vegetation. However, unvegetated sediment (i.e., mudflats) tends to be cohesive until disturbed. Construction activities involving soil disturbance, excavation, cutting/filling, stockpiling, and grading could result in increased erosion and sedimentation to surface waters if they occur during the rainy season. In-water activities (and potential sediment disturbances) can increase the amount of suspended solids in the water column. In addition, hazardous materials associated with construction equipment could adversely affect water quality if spilled or leaked due to improper storage.

Specific activities proposed with potential to generate construction-related water quality effects include raising existing levees; decommissioning external weirs; installing a new outfall lining, pipe extension, and diffuser on the San Pablo Bay intertidal outfall; installing mooring dolphins in Carquinez Strait; repairing roads; installing piping and appurtenances; and constructing pump facilities.

Surface waters would be directly exposed to construction-related sediments during installation of the mooring dolphins in the Carquinez Strait, as well as during high-tide periods when in-water work related to other project components is conducted, if this occurs. In addition, construction activities associated with creation of mitigation sites to offset wetlands effects (discussed in Section 3.4, “Biological Resources”) could have water quality effects like those discussed above.

No Action

No construction activity would take place under the No Action scenario. No construction-related water quality effects would result. No mitigation is required.

Alternatives 1, 2, and 3

This effect is considered potentially significant under Alternative 1 and significant under Alternatives 2 and 3 because construction activities could increase turbidity and runoff. Effects under Alternatives 2 and 3 could be of greater intensity than under Alternative 1 because of the increased amount of construction activity and soil exposure associated with increased levee heights. Implementation of Environmental Commitments A-3, A-6, and A-8 and Mitigation Measures 3.3-3 and 3.3-4 would reduce this effect 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 Water and Sediment Quality section.

- Environmental Commitment A-3: ~~Develop and~~ Implement Spill/Leak Prevention and Emergency Response Plan.
- Environmental Commitment A-6: ~~Obtain Coverage under the~~ Comply with Applicable National Pollutant Discharge Elimination System (NPDES) ~~General Construction~~ Permits.
- Environmental Commitment A-8: Hydroseed Levee Slopes and Other Disturbed Areas.
- Mitigation Measure 3.3-3: Control Turbidity during In-Water Work.
- Mitigation Measure 3.3-4: Implement Additional Water Quality Protection Measures for Construction of Outfall/Diffuser.

Effect 3.3-2: Decreased Surface Water Quality from Levee Failure

Under Alternatives 1, 2, and 3, existing levees would be maintained and raised over time. Levee failure could be caused by an earthquake or a design flaw, resulting in an uncontrolled release of dredged material or contaminated water to San Pablo Bay, in excess of applicable water quality standards.

No Action

No operations would occur that would have direct effects on surface waters. The levees in the action area would not be maintained over time and could become structurally unsound, potentially leading to breaches that could result in direct exchanges between San Pablo Bay waters and pond runoff that has become contaminated by exposure to old dredged materials. Catastrophic events, such as earthquakes, could lead to levee failure. Chemical concentrations currently found in the Mare Island disposal pond sediment could lead to violations of water quality standards if sufficient quantities of these sediments were re-suspended and transported to surface waters.

This is considered a potentially significant effect. Implementation of Mitigation Measure 3.2-2 would reduce this effect to a less-than-significant level. This measure is listed below and described in greater detail under “Environmental Commitments and Mitigation Measures” at the end of Section 3.2, “Geology, Soils, and Seismicity.”

- Mitigation Measure 3.2-2: Conduct Levee Inspection, Maintenance, and Monitoring.

Alternatives 1, 2, and 3

This effect is considered potentially significant. Implementation of Environmental Commitment A-3 and Mitigation Measures 3.2-1 and 3.2-2 would

reduce this effect 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 Water and Sediment Quality section and in Section 3.2, “Geology, Soils, and Seismicity.”

- Environmental Commitment A-3: ~~Develop and~~ Implement Spill/Leak Prevention and Emergency Response Plan.
- Mitigation Measure 3.2-1: Conduct Geotechnical Investigations for All Levee-Raising Activities and Implement Recommendations.
- Mitigation Measure 3.2-2: Perform Levee Inspection, Maintenance, and Monitoring.

Effect 3.3-3: Decreased Surface Water Quality from Pipeline Failure

The proposed action involves constructing or repairing a pipeline to convey dredged material from the off-loading area to the disposal ponds. A pipeline breach caused by an earthquake, normal wear, or a design flaw could result in an uncontrolled release of dredged material or slurry to any adjacent tidal or freshwater marsh areas, Carquinez Strait, or San Pablo Bay, depending on the location of a breach.

No Action

Under this scenario, no pipelines would be constructed or used. There would be no effect. No mitigation is required.

Alternatives 1, 2, and 3

This effect is considered potentially significant. Implementation of Environmental Measure A-3 and Mitigation Measures 3.2-4 and 3.2-5 would reduce this effect 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 Water and Sediment Quality section and in Section 3.2, “Geology, Soils, and Seismicity.”

- Environmental Commitment A-3: ~~Develop and~~ Implement a Spill/Leak Prevention and Emergency Response Plan.
- Mitigation Measure 3.2-4: Design and Construct Pipelines and Outfall to Industry Standards; Conduct Geotechnical Investigation.
- Mitigation Measure 3.2-5: Conduct Pipeline and Outfall Inspection and Maintenance.

Effect 3.3-4: Decreased Surface Water Quality from Stormwater Runoff

Raising the levees of the ponds would increase the surface area of the levees, thereby increasing stormwater runoff. Project features such as raised levees and

improved roadways could consist of material that is easily eroded by stormwater runoff, leading to surface water quality degradation due to increased sedimentation.

No Action

Under this scenario, stormwater runoff would be similar in quantity and character to baseline conditions. There would be no effect. No mitigation is required.

Alternatives 1, 2, and 3

This effect is considered potentially significant. Implementation of Environmental Commitments A-2, A-5, and A-8 and Mitigation Measure 3.2-2 would reduce this effect 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 Water and Sediment Quality section and in Section 3.2, “Geology, Soils, and Seismicity.”

- Environmental Commitment A-2: Implement Stormwater Management Practices.
- Environmental Commitment A-5: Implement Best Management Practices to Protect Surface Water Quality.
- Environmental Commitment A-8: Hydroseed Levee Slopes and Other Disturbed Areas.
- Mitigation Measure 3.2-2: Perform Levee Inspection, Maintenance, and Monitoring.

Effect 3.3-5: Decreased Surface Water Quality from Dredged Material Spillage during Off-Loading and Transfer

During off-loading and transfer activities, dredged material could be accidentally spilled to surface waters, either directly or indirectly through runoff. Loss of dredged material may result in increased turbidity, decreased dissolved oxygen, or possibly an exceedance of water quality standards, depending on the quantity of the release, the chemical characteristics of the dredged material, timing, and point of release.

No Action

Under this scenario, no new dredged material would be subject to spillage. There would be no effect. No mitigation is required.

Alternatives 1, 2, and 3

This effect is considered potentially significant. Implementation of Environmental Commitment A-5 would reduce this effect to a less-than-significant level. This measure is listed below and described in greater detail under “Environmental Commitments and Mitigation Measures” at the end of this Water and Sediment Quality section.

- Environmental Commitment A-5: Implement Best Management Practices to Protect Surface Water Quality.

Effect 3.3-6: Decreased Surface Water Quality from Effluent Discharges

Discharged effluent could degrade water quality in San Pablo Bay. Chemical constituents found in dredged material tend to bind to sediment particles. For these constituents, concentrations in effluent water would be limited by controlling decant water retention times so that a sufficient amount of sediment settles out before effluent is discharged.

Improper retention time management or acceptance of dredged material with constituents in excess of concentrations that could lead to WDR exceedances in effluent could lead to violations of the proposed effluent limits, with resulting effects on water quality.

No Action

Under this scenario, no effluent discharges would occur in excess of baseline conditions. There would be no effect. No mitigation is required.

Alternatives 1, 2, and 3

This effect is considered potentially significant. Implementation of Environmental Commitment A-1 would reduce this effect to a less-than-significant level. This measure is listed below and described in greater detail under “Environmental Commitments and Mitigation Measures” at the end of this Water and Sediment Quality section.

- Environmental Commitment A-1: Implement Effluent Water Quality Control.

Effect 3.3-7: Degradation of Groundwater during Operation

No known groundwater contamination has occurred as a result of historic dredged material disposal activities in the action area. Dredged materials are expected to be fine grained with a low permeability once consolidated. Consolidated material acts as an aquitard and prevents infiltration of surface water into the ground. Low permeability sediments that currently underlie the ponds are also expected to retard the infiltration of ponded water. Proposed dredged material acceptance criteria would keep contaminant concentrations in the pond bottoms similar to current conditions. Therefore, any water that may infiltrate after startup of operations should be of similar quality as water that may have infiltrated before startup. Despite these controls, a low probability remains that increased infiltration to groundwater could occur, with subsequent effects on groundwater quality.

No Action

Under this scenario, no leaching of dredged material pond water to underlying water-bearing zones would occur in excess of baseline conditions. There would be no effect. No mitigation is required.

Alternatives 1, 2, and 3

This effect is considered potentially significant. Implementation of Environmental Commitment A-4 would reduce this effect to a less-than-significant level. This measure is listed below and described in greater detail under “Environmental Commitments and Mitigation Measures” at the end of this Water and Sediment Quality section.

- Environmental Commitment A-4: Conduct Groundwater Monitoring.

Effect 3.3-8: Reduction of Groundwater during Operation**No Action**

Under this scenario, no changes in groundwater quantity would occur. There would be no effect. No mitigation is required.

Alternatives 1, 2, and 3

The proposed action would not use groundwater as part of project operations, nor is the action area located in an area of substantial groundwater recharge. There would be no effect. No mitigation is required.

Effect 3.3-9: Change in Drainage Patterns

Under the proposed action, drainage patterns in the action area would remain similar to baseline conditions. No substantial new areas of impervious surface would be created that would generate additional runoff. However, perimeter containment levees would be raised so that the centerline of the levee would be offset toward the interior of the pond. The surface area created on the outboard sides of the levees would therefore represent a new source of runoff.

No Action

Under this scenario, drainage patterns would be unchanged compared to baseline conditions. No effects would result. No mitigation is required.

Alternatives 1, 2, and 3

Runoff would be of concern mainly on the eastern levee sides of the six contiguous ponds, specifically near Ponds 4S, 4M, and 4N, where unmanaged stormwater runoff originating from the outer levee slopes could flood the proposed housing development. However, the proposed housing development would be raised and would be separated from the DMDF by an existing channel leading from a large wetland, such that flooding would be unlikely. Stormwater runoff from the outer levee slopes of the remaining ponds would flow into the adjacent saltwater wetlands, as currently happens, or into the proposed mitigation

area along the western levee slopes of Ponds 2S, 2M, and 2N. Flooding of the adjacent proposed housing development represents a potentially significant effect. Under Alternatives 2 and 3, the quantity of runoff could be higher than under Alternative 1 because the larger surface area of the raised levees would collect and discharge stormwater runoff. Implementation of Environmental Commitment A-2 would reduce this effect to a less-than-significant level. This measure is listed below and described in greater detail under “Environmental Commitments and Mitigation Measures” at the end of this Water and Sediment Quality section.

- Environmental Commitment A-2: Implement Stormwater Management Practices.

Effect 3.3-10: Risk of Flooding

Under the proposed action, no housing would be placed within a 100-year flood hazard area. With respect to the ponds, existing levee elevations are between 11.5 and 23.3 feet above msl. In the vicinity of the action area, the 100-year flood elevation is approximately 14.6 feet above msl. For comparison, the proposed housing development would be at an elevation of at least 13 feet above msl. The ponds would not be subject to flood hazard. In addition, the levees would be raised as part of the proposed action, further reducing flood risk.

Areas near the action area could be subject to flooding if high water levels in the ponds overtopped the levees. Overtopping could occur if the base elevations of the ponds became higher as a result of dredged material deposition, if water levels were maintained at a high level (i.e., minimum freeboard), or if outlet structures were blocked or damaged. These situations could be exacerbated by large amounts of rainfall. In addition, other structures or activities associated with the proposed action would be located in the identified area of flood inundation. These areas include Pier 34, the roadways between the docks and the ponds, and the pipeline that would be constructed between the Pier 35 area and the ponds. Although these structures are not expected to significantly impede or redirect flood flows, they may be exposed to damage as a result of flooding, and workers may be exposed to flood hazard while working in these areas.

No Action

Under this scenario, no changes would occur that would place housing or structures within a 100-year flood hazard area, nor would people or structures be exposed to a significant risk of loss, injury, or death involving flooding in excess of baseline conditions. There would no effect. No mitigation is required.

Alternatives 1, 2, and 3

Flooding effects are considered potentially significant. Implementation of Environmental Commitment A-2 and Mitigation Measures 3.3-1 and 3.3-2 would reduce these effects to less-than-significant levels. These measures are listed below and described in greater detail under “Environmental Commitments and Mitigation Measures” at the end of this Water and Sediment Quality section.

- Environmental Commitment A-2: Implement Stormwater Management Practices.
- Mitigation Measure 3.3-1: Flood-Proof All Facilities.
- Mitigation Measure 3.3-2: Evacuate Workers in Event of Hazardous Flooding.

Effect 3.3-11: Risk from Seiche, Tsunami, or Mudflow

The topography of the action area is relatively level, with minimal risk posed by mudflow. The 200-year recurrence tsunami has been estimated to result in wave runup of 2 feet above msl in the vicinity of the action area. The majority of the action area is above this elevation; however, for areas at or below 2 feet above msl, wave runup could result in damage to structures or expose people to a significant hazard.

No Action

Under this scenario, no changes would occur that would expose people or structures to a significant risk of loss, injury, or death involving seiche, tsunami, or mudflow in excess of baseline conditions. There would be no effect. No mitigation is required.

Alternatives 1, 2, and 3

Project activities would not alter the areal distribution of these lower elevations that may be subject to potential damage from wave runup. Therefore, there would be no change from the baseline condition, and there would be no effect from project activities. No mitigation is required.

Effect 3.3-12: Reduced Sediment Quality from Contaminated Sediments

Use of ponds for containment of material unsuitable for open-water disposal is not expected to substantially alter the existing sediment quality in the ponds. Current conditions pose minimal risk to ecological receptors according to the risk assessment performed by WESTON (2002). The proposed dredged material acceptance criteria are based on the condition of the existing pond sediment, which consists of historic dredged material. Use of these acceptance criteria as the maximum acceptable chemical concentrations in dredged material would therefore maintain the current sediment quality or baseline conditions. Baseline conditions range from clean to moderately contaminated (i.e., suitable as wetland foundation or other upland beneficial reuse, and well below hazardous waste).

Upon project completion, the types of allowable uses would therefore be similar to those currently available. However, placement of material with specific characteristics (e.g., chemical concentrations not in excess of wet cover guidelines) may be necessary to support the restoration of the site as seasonal wetlands. The proposed action includes a final restoration plan that would allow

the ponds to revert to seasonal wetlands at the close of the facility. This plan is described in Chapter 2 (see “DMDF Program Elements – 9. Final Pond Restoration and Monitoring Plan”), with more detail provided in Appendix E, Final Restoration Plan. WESTON would ensure that operation of the disposal ponds in the final stages supports the end use of the site. As the ponds approach capacity during the final years of operation, only material meeting the RWQCB wetland restoration criteria that would sustain the restoration of the ponds to seasonal wetlands would be accepted. The existing materials in the ponds will be sampled to address chemical and biological requirements for wetland restoration.

However, the potential remains for contaminated dredged material to lead to reductions in sediment quality. This degradation could occur if dredged material with constituents in excess of the limits is inadvertently accepted. Also, because people and other ecological receptors (particularly shorebirds and dabbling ducks, and migratory waterfowl) may gain access to the facility, there is a potential for increased risks to human health and the environment.

No Action

Under this scenario, there would be no further placement of dredged material at the site, and the disposal ponds would revert to wetland habitat. However, vegetation management would continue, limiting the habitat value of the ponds. Existing surface sediment quality would be improved over time because some chemicals would degrade via biological and chemical processes. Organic material would slowly be deposited at the bottom of the ponds as decaying plant material accumulates. Erosion of the berms and levees would not alter sediment quality in the disposal pond because these structures were constructed of dewatered dredged material from the ponds. In general, sediment quality under this scenario would be similar to, or better than, baseline conditions. This effect is considered less than significant. No mitigation is required.

Alternatives 1, 2, and 3

Because the proposed acceptance criteria are the same for Alternatives 1, 2, and 3, this effect is similar for these three alternatives. This effect is considered potentially significant. Implementation of Environmental Commitments A-7 and B-1 would reduce this effect 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 Water and Sediment Quality section and in Section 3.4, “Biological Resources.”

- Environmental Commitment A-7: Monitor Dredged Material Sediment Quality.
- Environmental Commitment B-1: Prepare and Implement Water Management Plan and Public Access Plan.

Effect 3.3-13: Violations of Effluent Limits

No sediments would be discharged to the adjacent tidal wetlands or San Pablo Bay during operation of the disposal facility. Although the initial discharge of

hydraulically transported sediments to the six contiguous ponds would be highly turbid (typically 1,600 mg/l), solids would begin to settle out immediately. Column-settling tests conducted with dredged material that was predominantly fine-grained (99 percent silts and clays) from the Port of Oakland's 50-foot deepening project showed that 90 percent of solids settled out within the first 24 hours and 99.99 percent settled out within 15 days. Coarser material would settle out more quickly.

Water quality requirements would be met through the management of suspended solids. Water would be tested after the initial settling and clarifying phase to determine whether the WDRs can be met. If additional settling and clarification is necessary to meet the effluent limits, the overlying water from the disposal pond would be held in an adjacent pond and possibly a third pond before discharge to San Pablo Bay. The configuration of the six contiguous ponds will require that the decant water pass through at least one other pond as a matter of course. This cycling of disposal pond effluent through a series of ponds would ensure that suspended solids are retained in the disposal facility and that WDRs are met at the point of discharge to San Pablo Bay.

No Action

Under this scenario, there would be no further discharge from the disposal ponds. There would be no effect. No mitigation is required.

Alternatives 1, 2, and 3

The proposed acceptance criteria and water management approach are the same for Alternatives 1, 2, and 3. These strategies are anticipated to ensure that effluent limits are met; however, the potential remains for contaminated sediments to lead to violations of effluent limits in the event of improper retention time management or placement of dredged material with chemical concentrations that would lead to an exceedance of WDRs in the final effluent. This effect is considered potentially significant. Implementation of Environmental Commitments A-1 and B-1 would reduce this effect 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 Water and Sediment Quality section and in Section 3.4, "Biological Resources."

- Environmental Commitment A-1: Implement Effluent Water Quality Control.
- Environmental Commitment B-1: Prepare and Implement Water Management Plan and Public Access Plan.

Environmental Commitments and Mitigation Measures

Environmental Commitments

WESTON has made environmental commitments regarding water and sediment quality in order to avoid or minimize the effects of the action alternatives. These commitments are incorporated into the project description and are detailed below. The commitments supplement the mitigation measures that have been identified during the environmental review process.

Environmental Commitment A-1: Implement Effluent Water Quality Control

WESTON will work to preserve environmental conditions at the site and water quality in the Bay. For example, if effluent salinity exceeds 30 ppt, effluent will be discharged only during higher tides when the outfall invert is submerged, to dilute the effluent as it enters San Pablo Bay.

Before commencing operations at the DMDF, WESTON must obtain WDRs from the RWQCB under the Porter-Cologne Water Quality Control Act for the disposal of dredged material and discharge of resulting decant water. The WDRs will establish the dredged material acceptance criteria for the material and discharge of resulting decant water. The WDRs will establish the dredged material acceptance criteria for the DMDF. As required by these WDRs the WDRs that will be imposed by the RWQCB, WESTON will monitor and test effluent quality, using laboratory analyses and other methods, to ensure compliant effluent quality. A QA/QC program will be implemented to oversee the maintenance of water quality.

QA/QC activities will be conducted when the dredged material is placed in the ponds and during the drying and desiccation period. WESTON will employ a full-time QA/QC project manager and a staff of inspectors. The inspection staff will work 24 hours per day, 7 days per week during active disposal and discharge. In addition to his/her regular work hours, the QA/QC project manager will be on call 24 hours per day, 7 days per week, to address issues that may arise after hours.

Project Proponent Activities

~~WESTON will be responsible for performing QA/QC activities during placement of material into the ponds. Continuous 24-hour per day inspection will be performed to ensure that the material is being placed in accordance with environmental and safety specifications. The WESTON QA/QC project manager will direct the dredging contractor where and when to place material. The QA/QC staff will perform all effluent sampling to ensure that WDRs established by the RWQCB are being met. The QA/QC project manager or his/her designee will make the decision of when and where to decant effluent.~~

Monitoring reports will be submitted quarterly and annually to as specified by the RWQCB and the City, or more frequently if required in the WDRs. If monitoring results indicate that effluent limits were exceeded during a discharge, increased effluent settlement times will be implemented and/or barge material acceptance criteria will be reevaluated and adjusted so that effluent limits are met. Changes in dredged material acceptance criteria will be subject to approval by the RWQCB.

Finally, the integrity of the containment levee system will be continuously inspected, as will levee raising and maintenance activities and stormwater collection and conveyance systems. All other environmental and safety monitoring activities will be performed by the WESTON QA/QC staff or project manager.

WESTON will complete daily quality control reports, with input from the dredging contractor. The daily reports will be maintained in the project office at the DMDF site and will provide data for the monitoring reports submitted to the RWQCB. These reports will include the following information at a minimum:

- a list of dredging contractor personnel on site, plus a job description and list of responsibilities for each person;
- the type and number of each piece of equipment used;
- the production rate of each piece of equipment for that 24-hour period, including the number of scows unloaded;
- a breakdown of active and inactive unloader time;
- the amount of material placed into each pond;
- the amount of freeboard in each pond; and
- the results of inspecting the perimeter levees for cracks, bulges, abrupt settlement, and seepage.

Dredging Contractor Activities

The dredging contractor will be required to supply the necessary equipment and personnel to place material into the ponds, under the direction of the WESTON QA/QC project manager. Further, the dredging contractor will be required to maintain onsite earthmoving equipment and special materials for emergency response to contain spills of dredged material in the unlikely event of a levee breach, pipe break, or other accident during placement. Emergency response procedures are described below in Environmental Commitment A-3: Implement Spill/Leak Prevention and Emergency Response Plan.

Environmental Commitment A-2: Implement Stormwater Management Practices

The proposed action will incorporate stormwater management practices including, but not limited to, those listed below to reduce runoff and erosion. WESTON ~~has developed~~ will develop a draft stormwater pollution prevention control plan (SWPPP) consistent with RWQCB standards, included as Appendix

G to the OMMP (refer to Appendix B of the EIS/EIR), that includes stormwater controls in the levee design, construction, and operation of the levee (refer to Environmental Commitment A-6 for further details). A hydrological study will be performed by a qualified hydrologist to verify that the final SWPPP complies with the applicable RWQCB standards support the design and development of a stormwater control plan to ensure it adequately handles the additional runoff.

- The disposal ponds will be operated with at least 2 feet of freeboard to prevent flooding of adjacent areas. WESTON's QA/QC staff shall perform regular inspections of pond water levels to ensure that at least 2 feet of freeboard is present. Inspection reports shall be included in QA/QC reports maintained in the project file.
- In the vicinity of Ponds 4S, 4M, and 4N, WESTON will also use channel drains to divert and control stormwater. The channel drains will be located at the outer toe of the new levee, along the entire length of the eastern slope. Additional drains at other locations will be installed as required, depending on future needs or concerns. Before the drains are placed, the existing levees will be graded to provide the necessary slope to transport the runoff to its desired location. WESTON's QA/QC staff will inspect these drains on a regular basis to verify that they are operating as designed, and have not become clogged with debris or other material. Inspection reports shall be included in QA/QC reports maintained in the project file. WESTON will maintain these drains as necessary to ensure proper functioning. Any debris or vegetation that could impede stormwater flow shall be cleared during regular maintenance activities. Damaged channel drains shall be repaired before the onset of winter rains or as soon as practicable.
- Collected runoff will be directed to an existing concrete channel the ultimately discharges to Carquinez Strait.

Stormwater quality will also be monitored over the life of the project to ensure that water quality is not degraded from existing conditions from material conveyed via stormwater runoff. Details regarding stormwater monitoring and reporting are provided in the proposed Stormwater Monitoring Plan included in the OMMP (Appendix B).

Environmental Commitment A-3: Implement Spill/Leak Prevention and Emergency Response Plan

The WESTON QA/QC project manager and staff will maintain ~~(in the action area)~~ an emergency ~~management program with~~ response plan in the project office. A draft plan is included as Appendix D to the OMMP (refer to Appendix B of the EIS/EIR). The plan contains the following elements.

- Notification directory.
- Lines of communication for use following an incident.
- Emergency phone directory.
- Emergency notification log form.
- Contingency plan, including an emergency plan of action.

- Spill prevention and response plan.
- Hazards communication program.
- Personnel training program. Before commencement of each new disposal project, construction workers and operators will receive specialized training to identify and mitigate spills and communicate emergencies.
- Post-earthquake inspection and corrective action plan.
- Safety manual and accident reporting plan.

Prevention of Spills during Off-Loading and Transport

For hydraulic off-loading and transport, the dredging contractor will implement BMPs to conform to a performance standard of achieving maximum containment of dredged material and to prevent incidental spills of slurry into San Pablo Bay or adjacent wetlands. The best available technology that is economically achievable will be used. The WESTON QA/QC monitoring program of the facility will include regular inspection of pipelines to ensure that there are no leaks or damaged/worn sections of pipe in need of replacement.

For mechanical off-loading and truck transport, the dredging contractor or WESTON will install K-rail barriers (overlain with high-density polyethylene sheeting) along the eastern edge of the pier structure, along Tyler Road adjacent to sensitive habitats, along the dirt road to Pond 7 to direct traffic. Additional BMPs to be implemented by the dredging contractor or WESTON include covering the gap between the barge and the pier decking, sealing the trucks so that all mud and water is contained, thoroughly cleaning the pier deck after every off-loading episode, and periodic structural inspection of the pier to ensure ongoing structural integrity of the pier.

The WESTON QA/QC monitoring program for the facility will include regular inspection of these features to ensure that all mud and muddy water is contained in the action area and not released into the Bay or adjacent wetlands. Inspection reports will be included in the QA/QC reports maintained in the project file. WESTON QA/QC staff will immediately stop any activities that could result in water reaching the Bay and will implement appropriate corrective actions, should a spill occur.

Prevention of Spills during Placement

During placement of dredged material, WESTON and contractors will maintain onsite earthmoving equipment and special materials to respond to spills of dredged material in the unlikely event of a levee breach, pipe break, or other accident. The contractor will be directed to take immediate and appropriate action to respond to the emergency; actions may include mobilizing onsite earthmoving equipment and ceasing off-loading operations. ~~All off-site~~ As further detailed in the emergency response plan, emergency response stakeholders and regulatory agencies with jurisdiction over the incident will be notified immediately by phone to initiate emergency response actions and

provide notification. More extensive written notification will ensue within 5 days to document the incident.

Prevention of Leaks through Levees

Ponds 2N and 4N are located next to the H-1 landfill. However, no migration of waterborne contaminants from the landfill to the disposal ponds (or from the ponds to adjoining areas) is anticipated. The disposal ponds have been isolated from the landfill by a separation trench that directs any landfill-derived leachate to the City's wastewater treatment plant. Extensive analysis of the character of the levee construction material indicates that the sediments composing the levees are of very low permeability and will form an effective barrier between leachate from the ponds and the surrounding environment.

Environmental Commitment A-4: Conduct Groundwater Monitoring

Groundwater monitoring will be conducted by WESTON to confirm that groundwater quality is not affected by disposal activities. In addition to the three existing groundwater monitoring wells located near Ponds 2N and 4N, 10 wells have been installed. These new wells are located around the perimeter of the six contiguous ponds as well as around Pond 7. Wells were screened within the first occurring (typically shallow or intermediate) groundwater zone. These wells are sampled quarterly ~~and tested periodically~~ to ensure that groundwater quality is maintained. Baseline groundwater quality (based on quarterly sampling) will be established before dredged material is accepted for the ponds.

A draft of the proposed Groundwater Monitoring Plan, prepared by WESTON based on RWQCB standards, is included as Appendix J to the OMMP (refer to Appendix B of the EIS/EIR). The final Groundwater Monitoring Plan is subject to RWQCB review and approval. Pursuant to the draft Plan, WESTON will perform groundwater sampling and testing. Groundwater sampling and testing will be performed by WESTON quarterly for the first year prior to operation or until sufficient data have been collected to establish baseline conditions, or as otherwise specified by the RWQCB. If the results of the baseline sampling indicate that there ~~has been~~ is no significant change in groundwater quality on a seasonal basis, the wells will be sampled twice per year (once in the dry season and once in the wet season) ~~thereafter~~ as part of the long-term monitoring of the site, or as otherwise required by the RWQCB, once operations begin. Groundwater chemistry will be compared to ~~pre-operational~~ baseline conditions across water-bearing zones to determine whether groundwater has been affected by dredged material disposal operations.

Summary reports of the groundwater monitoring will be submitted by WESTON to the RWQCB in compliance with the WDRs and WETP RAP.

If groundwater quality falls below ~~exceeds~~ ambient levels, WESTON will design and implement additional measures or actions in conjunction with and subject to approval by DTSC and the RWQCB. As a performance standard, these measures and actions will maintain groundwater quality at ambient levels.

Environmental Commitment A-5: Implement Best Management Practices to Protect Surface Water Quality

WESTON and/or the dredging contractor under WESTON's supervision as appropriate will implement BMPs to prevent dredged material spills during construction (i.e., improving the outfall) and operation (i.e., off-loading).

Measures to prevent spills ~~shall~~ ~~may~~ include but are not limited to

- installation of K-rail barriers overlain with HDPE sheeting along Tyler Road adjacent to sensitive habitats, as well as along the dirt haul road to Pond 7;
- sealing of the trucks so all mud and water is contained; and
- covering the gap between the pier and barge.

These measures will conform to a performance standard of achieving maximum containment of dredged material and will represent the best available technology that is economically achievable. WESTON will ensure that these measures are implemented by the dredging contractors.

Before commencement of each new disposal project, all site workers, including the dredging contractor, will receive specialized training to identify and mitigate spills and communicate emergencies.

WESTON's QA/QC staff will perform regular inspections of these BMP control features to ensure that all water is contained in the action area and not released into the Bay, except through the effluent outfall. Inspection reports will be included in WESTON's QA/QC reports maintained in the project file.

Monitoring results collected as part of any in-water work (outfall improvement, dolphin installation, pier repair) will be reported to the RWQCB. WESTON's QA/QC staff will immediately stop any activities that could result in water reaching the Bay and will implement appropriate corrective actions, should a spill occur.

Environmental Commitment A-6: ~~Obtain Coverage under the Comply with Applicable National Pollutant Discharge Elimination System (NPDES) General Construction Permits~~

To reduce or eliminate construction-related water quality effects, before onset of any construction activities, WESTON or its contractors shall obtain coverage under the NPDES General Construction Permit. ~~Construction activities and shall thereafter ensure that all construction activities~~ comply with the conditions in this permit, which. These conditions include preparation of a submittal of the proposed SWPPP to the RWQCB, implementation of BMPs, and monitoring by WESTON to ensure that effects on water quality are minimized. As further discussed in Environmental Commitment A-2, a draft SWPPP is included as Appendix G to the OMMP (refer to Appendix B of the EIS/EIR), including proposed monitoring requirements.

As part of this process, multiple BMPs shall be implemented to provide effective erosion and sediment control. These BMPs shall be selected to achieve maximum sediment removal and represent the best available technology that is

economically achievable. BMPs to be implemented shall include but are not limited to

- temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover);
- BMPs acceptable to the ~~Regional Water Quality Control Board~~ (RWQCB to protect drainage facilities on the site and in downstream offsite areas from sediment; and
- establishment of vegetative cover on the construction site as soon as possible after disturbance, in accordance with Environmental Commitment A-8.

WESTON shall verify that a Notice of Intent (NOI) and a SWPPP have been filed before allowing construction to begin. WESTON and/or its contractor agent shall routinely inspect the action area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. Inspection reports will be included in project files. WESTON shall immediately notify the contractor if there is a noncompliance issue and shall require compliance. The RWQCB has enforcement authority over the NPDES permit, and can take action to ensure that WESTON is in compliance with the permit. Additionally, WESTON will ensure that operation of the DMDF complies with the NPDES Industrial Activities Permit to the extent it is determined applicable.

Environmental Commitment A-7: Monitor Dredged Material Sediment Quality

To ensure that sediment quality is maintained, WESTON will monitor sediment quality on a regular basis during project operation. Before the WESTON facility staff accepts material for disposal, the dredging sponsor will be required to submit analytical data characterizing that were used to characterize their material for the Dredged Material Management Office (DMMO). Material deemed suitable for open water disposal by the DMMO will be accepted at the facility; material unsuitable for open water disposal must demonstrate compliance with the Mare Island acceptance criteria. WESTON will rely on the sampling and analysis conducted for the DMMO to determine acceptability. The WESTON facility staff will sample and verify the quality of at least 5 percent of the dredged material load immediately before off-loading. Composite sediment samples will be collected from the bottom of each disposal pond after each lift of material is dewatered and consolidated. These samples will be tested and the results recorded. Sampling records and analytical reports will be maintained in the onsite project file and a database maintained at the project office, and will be submitted to the RWQCB for review and monitoring, as required in the WDRs.

WESTON will immediately notify the RWQCB if sampling results indicate that sediment quality is being degraded or acceptance criteria are not being met. WESTON will evaluate the extent of the problem and develop appropriate corrective actions to prevent future occurrences and address the noncompliant material placed in the ponds. These corrective actions will be subject to approval by the RWQCB and the Corps.

~~A complete description of the proposed monitoring plan is in the OMMP, Appendix B. A draft of the proposed Sediment, Water and Effluent Monitoring Plan is contained in Appendix H of the OMMP (refer to Appendix B of the EIS/EIR). This monitoring plan is subject to revision by the RWQCB as part of the approval process for the required WDRs.~~

Environmental Commitment A-8: Hydroseed Levee Slopes and Other Disturbed Areas

Pursuant to RWQCB standards and consistent with the required WDRs,

WESTON will hydroseed and periodically irrigate all new outboard levee slopes and tops following levee construction activities, as well as other areas that undergo ground disturbance during construction, with an erosion control seed mix of native plants. The seed mix shall contain non-invasive native grasses and plants. Hydroseeding shall be repeated as needed before the onset of winter rains on any disturbed areas (i.e., levee slopes). Silt fences shall remain in place until seeds have germinated and vegetation is dense enough to function in erosion control, as determined by inspection.

Environmental Commitment B-1: Prepare and Implement Water Management Plan and Public Access Plan

This measure is described in detail in Section 3.4, “Biological Resources – Environmental Commitments and Mitigation Measures.”

Mitigation Measures

Mitigation Measure 3.2-1: Conduct Geotechnical Investigations for All Levee-Raising Activities and Implement Recommendations

This mitigation measure is described in Section 3.2, “Geology, Soils, and Seismicity.”

Mitigation Measure 3.2-2: Perform Levee Inspection, Maintenance, and Monitoring

This mitigation measure is described in Section 3.2, “Geology, Soils, and Seismicity.”

Mitigation Measure 3.2-4: Design and Construct Pipelines and Outfall to Industry Standards; Conduct Geotechnical Investigation

This mitigation measure is described in Section 3.2, “Geology, Soils, and Seismicity.”

Mitigation Measure 3.2-5: Conduct Pipeline and Outfall Inspection and Maintenance

This mitigation measure is described in Section 3.2, “Geology, Soils, and Seismicity.”

Mitigation Measure 3.3-1: Flood-Proof All Facilities

WESTON will use all appropriate standard engineering practices to ensure that project facilities are adequately protected from flood damage, and will comply with all relevant FEMA guidelines.

Mitigation Measure 3.3-2: Evacuate Workers in Event of Hazardous Flooding

In the event of a flood forecast or a tsunami warning, the contractor will promptly evacuate workers from the action area to ensure worker safety.

Mitigation Measure 3.3-3: Control Turbidity during In-Water Work

During construction of the mooring dolphins and any other structures that involve direct in-water work with potential to generate turbidity, WESTON will control the release of sediment to surface water by installing a silt curtain or another method that will control turbidity to the following specifications. This will ensure that construction activities result in minimal increases in turbidity or suspended solids in the surface water.

WESTON will monitor turbidity during the installation of the dolphins, dredging to extend the outfall, placement of rock for diffuser construction, and any future repairs at Pier 34. Basin Plan standards for turbidity state that project activities will not cause an increase in ambient turbidity by more than 10 NTU [nephelometric turbidity units] above background turbidity where natural turbidity is greater than 50 NTU ~~[nephelometric turbidity units]~~ (Regional Water Quality Control Board 1995). During the first week of construction, turbidity measurements will be taken in the Carquinez Strait or San Pablo Bay, upcurrent of construction and at distances of 200 and 600 feet downstream of the project site for baseline comparison conditions. Measurements will be taken three times per day during the construction period, and measurements should be taken where ~~the flow regime is applicable to the relative flow regime around the construction zone so~~ may be affected by the construction zone to ensure the sample is representative of the water quality affected by construction.

If turbidity violates the Basin Plan standard described above, turbidity measurements will be repeated to confirm the exceedance. Should confirmational samples still violate the standard, additional measures will be taken to reduce the resuspension of sediment, including slowing the rate of dredging or rock placement, changing the configuration of silt curtain, working during low tide, or other measures. Should these contingency actions not achieve compliance with the standard, operations will stop and the RWQCB will be notified. Investigation of the cause of the significant turbidity increase will be conducted and additional corrections made in construction operations where applicable. If necessary, the frequency and duration of monitoring may be revised in coordination with the RWQCB. This mitigation measure may be modified based on additional conditions imposed as part of the required ~~is subject to alteration through negotiations of the requested~~ permits from the Corps, California Department of Fish and Game (CDFG), and RWQCB.

Mitigation Measure 3.3-4: Implement Additional Water Quality Protection Measures for Construction of Outfall/Diffuser

Installation of a new lining, pipe extension, and diffuser on the San Pablo Bay outfall shall occur primarily during low tide. If this work needs to be performed when the work area is submerged, WESTON or its contractor shall deploy silt curtains, or other measures that will hydrologically isolate the submerged work area from surrounding surface water to retain resuspended sediments within the

work area. These measures shall be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable.

These measures shall remain in place after construction is complete until turbidity in the work area is comparable to ambient conditions in the vicinity of the outfall. Turbidity shall be measured using turbidity meter. WESTON shall verify that appropriate measures have been implemented before allowing construction to begin. WESTON shall routinely inspect the action area during construction to verify that these measures are properly maintained. WESTON shall immediately notify the contractor if there is a noncompliance issue and shall require compliance.

Summary of Effects and Mitigation Measures by Alternative

Table 3.3-4. Summary of Water and Sediment Quality Effects and Mitigation Measures

	Alternative 1	Alternative 2	Alternative 3	No Action
<i>Water Quality</i>				
Effect 3.3-1: Decreased Water Quality from Construction Activities				
Quantitative Comparison	Construction-related runoff and sedimentation	Construction-related runoff and sedimentation	Construction-related runoff and sedimentation	No construction
Significance before Mitigation	PS	S	S	NE
Significance after Mitigation	LS	LS	LS	NE
Mitigation Measures				
A-3: Develop and Implement Spill/Leak Prevention and Emergency Response Plan	X	X	X	
A-6: Obtain Coverage under the Comply with Applicable National Pollutant Discharge Elimination System (NPDES) General Construction Permits	X	X	X	
A-8: Hydroseed Levee Slopes and Other Disturbed Areas	X	X	X	
3.3-3: Control Turbidity During In-Water Work	X	X	X	
3.3-4: Implement Additional Water Quality Protection Measures for Construction of Outfall/Diffuser	X	X	X	

	Alternative 1	Alternative 2	Alternative 3	No Action
Water Quality				
Effect 3.3-2: Decreased Surface Water Quality from Levee Failure				
Quantitative Comparison	Levees maintained; some potential for failure	Levees maintained; some potential for failure	Levees maintained; some potential for failure	Levee degradation over time
Significance before Mitigation	PS	PS	PS	PS
Significance after Mitigation	LS	LS	LS	LS
Mitigation Measures				
A-3: Develop and Implement a Spill/Leak Prevention and Emergency Response Plan	X	X	X	
3.2-1: Conduct Geotechnical Investigations for All Levee-Raising Activities and Implement Recommendations	X	X	X	
3.2-2: Perform Levee Inspection, Maintenance, and Monitoring	X	X	X	X
Effect 3.3-3: Decreased Surface Water Quality from Pipeline Failure				
Quantitative Comparison	Potential pipeline breach	Potential pipeline breach	Potential pipeline breach	No pipeline breach
Significance before Mitigation	PS	PS	PS	NE
Significance after Mitigation	LS	LS	LS	NE
Mitigation Measures				
A-3: Develop and Implement Spill/Leak Prevention and Emergency Response Plan	X	X	X	
3.2-4: Design and Construct Pipelines and Outfall to Industry Standards; Conduct Geotechnical Investigation	X	X	X	
3.2-5: Conduct Pipeline and Outfall Inspection and Maintenance	X	X	X	
Effect 3.3-4: Decreased Surface Water Quality from Stormwater Runoff				
Quantitative Comparison	Potential erosion	Potential erosion	Potential erosion	No new erosion-prone surfaces
Significance before Mitigation	PS	PS	PS	NE
Significance after Mitigation	LS	LS	LS	NE

	Alternative 1	Alternative 2	Alternative 3	No Action
Water Quality				
Mitigation Measures				
A-2: Implement Stormwater Management Practices	X	X	X	
A-5: Implement Best Practices to Protect Water Quality	X	X	X	
A-8: Hydroseed Levee Slopes and Other Disturbed Areas	X	X	X	
3.2-2: Perform Levee Inspection, Maintenance, and Monitoring.	X	X	X	
Effect 3.3-5: Decreased Surface Water Quality from Dredged Material Spillage during Off-Loading and Transfer				
Quantitative Comparison	Potential for spillage	Potential for spillage	Potential for spillage	No dredged material handling
Significance before Mitigation	PS	PS	PS	NE
Significance after Mitigation	LS	LS	LS	NE
Mitigation Measures				
A-5: Implement Best Management Practices to Protect Surface Water Quality	X	X	X	
Effect 3.3-6: Decreased Surface Water Quality from Effluent Discharges				
Quantitative Comparison	Potential for effluent violations	Potential for effluent violations	Potential for effluent violations	No effluent discharge
Significance before Mitigation	PS	PS	PS	NE
Significance after Mitigation	LS	LS	LS	NE
Mitigation Measures				
A-1: Implement Effluent Water Quality Control	X	X	X	
Effect 3.3-7: Degradation of Groundwater during Operation				
Quantitative Comparison	Potential for groundwater contamination	Potential for groundwater contamination	Potential for groundwater contamination	No new potential contamination sources
Significance before Mitigation	PS	PS	PS	NE
Significance after Mitigation	LS	LS	LS	NE
Mitigation Measures				
A-4: Conduct Groundwater Monitoring	X	X	X	

	Alternative 1	Alternative 2	Alternative 3	No Action
Water Quality				
Effect 3.3-8: Reduction of Groundwater during Operation				
Quantitative Comparison	No use of groundwater	No use of groundwater	No use of groundwater	No use of groundwater
Significance before Mitigation	NE	NE	NE	NE
Significance after Mitigation	NE	NE	NE	NE
Mitigation Measures				
None required	X	X	X	X
None available				
Effect 3.3-9: Change in Drainage Patterns				
Quantitative Comparison	Potential for runoff from levees	Higher potential for runoff from larger levees	Higher potential for runoff from larger levees	No change in drainage patterns
Significance before Mitigation	PS	PS	PS	NE
Significance after Mitigation	LS	LS	LS	NE
Mitigation Measures				
A-2: Implement Stormwater Management Practices	X	X	X	
Effect 3.3-10: Risk of Flooding				
Quantitative Comparison	Potential for flood damage/hazard	Potential for flood damage/hazard	Potential for flood damage/hazard	No additional flood hazard
Significance before Mitigation	PS	PS	PS	NE
Significance after Mitigation	LS	LS	LS	NE
Mitigation Measures				
A-2: Implement Stormwater Management Practices	X	X	X	
3.3-1: Flood-Proof All Facilities	X	X	X	
3.3-2: Evacuate Workers in Event of Hazardous Flooding	X	X	X	
Effect 3.3-11: Risk from Seiche, Tsunami, or Mudflow				
Quantitative Comparison	Minimal risk	Minimal risk	Minimal risk	No new risk
Significance before Mitigation	NE	NE	NE	NE
Significance after Mitigation	NE	NE	NE	NE
Mitigation Measures				
None required	X	X	X	X
None available				

	Alternative 1	Alternative 2	Alternative 3	No Action
Water Quality				
Effect 3.3-12: Reduced Sediment Quality from Contaminated Sediments				
Quantitative Comparison	Potential slight change	Potential slight change	Potential slight change	No change
Significance before Mitigation	PS	PS	PS	LS
Significance after Mitigation	LS	LS	LS	LS
Mitigation Measures				
A-7: Monitor <u>Dredged Material</u> Sediment Quality	X	X	X	
B-1: Prepare and Implement Water Management Plan and Public Access Plan	X	X	X	
Effect 3.3-13: Violations of Effluent Limits				
Quantitative Comparison	Potential for violation	Potential for violation	Potential for violation	No effluent discharge; no violation
Significance before Mitigation	PS	PS	PS	NE
Significance after Mitigation	LS	LS	LS	NE
Mitigation Measures				
A-1: Implement Effluent Water Quality Control	X	X	X	
B-1: Prepare and Implement Water Management Plan and Public Access Plan	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.				