

**ORDER NO. R5-2006-XXX**  
**INFORMATION SHEET**

PORT OF STOCKTON  
WEST COMPLEX DOCKS 14 AND 15 DREDGING PROJECT  
ROBERTS ISLAND NO. 1 DREDGED MATERIAL DISPOSAL SITE  
SAN JOAQUIN COUNTY

**Background Information**

In July 2000, the United States Navy conveyed approximately 1,500 acres of Rough and Ready Island through transfer and lease to the Port of Stockton (Discharger). The Discharger refers to this area as the West Complex. The Discharger plans to have a phased development of the site for maritime, industrial, commercial and other related operations over the next 20 years. In order to provide access by modern deep draft commercial vessel traffic, the Discharger proposes to dredge the river bottom adjacent to docks No. 14 and 15. The project would remove sediment and debris to a depth of 35 feet below mean low, low water with one additional foot for overdredge.

**Disposal Site**

The dredged material would be placed in a nearby upland disposal site on Roberts Island. The Roberts Island No. 1 site (RN1) is located on the northern margin of Roberts Island, adjacent to the San Joaquin River. A second dredged material disposal site, Roberts Island No.2, exists on Roberts Island, but is not covered by this Order.

The Roberts Island No. 1 site consists of three areas referred to as A, B and C. Area A is the primary disposal area for previous channel maintenance dredging of the Stockton Deep Water Ship Channel (DWSC) and one previous dock dredging of the West Complex. The proposed dredging project covered by this Order does not include Area A. Discharge of dredged material is only authorized to Areas B and C. The dredged material must be removed by 31 October 2007.

The proposed project will generate approximately 653 acre-feet of dredged slurry (sediment and water). The Discharger has calculated the above ground capacity to be 364 acre-feet and that the total available capacity at RN1, with infiltration and evaporation, is sufficient to contain all water and solids without discharge to surface waters. This Order requires that 2 feet of freeboard be maintained in RN1, Areas B and C. If the freeboard limit is reached, the Discharger must stop dredging. No discharge from RN1 to surface water is authorized.

**Dissolved Oxygen**

Dissolved Oxygen (DO) levels in the Stockton DWSC have regularly fallen to critical levels in the central and eastern portions of the channel, especially during the late summer and early fall. The factors responsible for these low DO levels include low San Joaquin River inflows, warm water temperatures, high biochemical demand, reduced tidal circulation, increased hydraulic

residence time and intermittent reverse flows in the San Joaquin River past Stockton. The DWSC is considered impaired for DO and is on the Clean Water Act (CWA) 303(d) list for impaired water bodies. Low DO can have adverse impacts on fisheries and other beneficial uses of the waters in the Delta. To protect these beneficial uses, the State has established DO objectives of 5.0 mg/L for the entire Delta throughout the year, and a more restrictive DO objective of 6.0 mg/L for the DWSC from September through November when endangered salmonid species are likely to be present.

Increasing the depth of the DWSC through dredging will incrementally increase the hydraulic residence time in the DWSC, which may allow more time for biochemical oxygen demand to be expressed. In addition, the activities associated with the West Complex may contribute to an increase in the amount of oxygen demanding substances discharged to the river.

In June 2004, the Discharger approved an Environmental Impact Report (EIR) for a larger project, which included dredging all seven docks at the West Complex. Mitigation measures in the EIR specify that the Discharger shall assume the operation and maintenance of the US Army Corps of Engineer's (Corps) jet aeration device to provide mitigation for existing conditions. In addition, the Discharger proposes to provide additional mitigation for possible effects of the proposed project dredging.

The Aeration Agreement detailed in Attachment B specifies that the Discharger provide long-term mitigation for both current conditions, as well as for possible impacts of increased channel geometry due to dredging of the docks at the West Complex. In addition, dredging operations may also produce an oxygen demand in the vicinity of the dredging operation. In order to mitigate for the potential reduction in DO concentrations related to the actual dredging operation, the Aeration Agreement specifies that the Discharger will operate a localized oxygen diffuser near the dredging operation at all times while dredging is occurring.

### **Potential Groundwater Impacts**

The soil samples collected from sediment at Docks 14 and 15 were analyzed for trace metals using the Waste Extraction Test with de-ionized water (DIWET). The DIWET is an analytical method used to evaluate the potential for long-term impacts to groundwater from placement of waste in a neutral environment. Questions have been raised about the appropriateness of using the DIWET for evaluating leachate characteristics at the Roberts Island disposal site since material previously placed at the site has been found to be acidic. Metal constituents are usually more soluble in acidic conditions.

Constituent concentrations measured in the DIWET have not always been shown to be representative of actual concentrations found in subsequent groundwater monitoring. Based on past experience and groundwater monitoring at this site, we have found that the use of DIWET may overestimate the threat to water quality posed by the leachate.

The DIWET tests found that the sample leachate contained concentrations of lead and arsenic that exceeded water quality objectives for drinking water. All other metals tested were found at levels below water quality objectives. The lead concentrations in the soil samples ranged from 4.7 µg/L to 6.8 µg/L with an average concentration of 5.8 µg/L. The arsenic concentrations in the soil samples ranged from 4.4 µg/L to 4.8 µg/L with an average concentration of 4.6 µg/L. The Basin Plan groundwater objective prohibits the discharge of chemical constituents in concentrations that adversely affect beneficial uses. Designated beneficial uses of ground water are municipal and domestic supply, industrial service and process supplies, and agricultural supply. The Cal/EPA Office of Environmental Health Hazard Assessment has published a Public Health Goal of 2.0 µg/L for lead and 0.004 µg/L for arsenic in drinking water.

Arsenic is naturally occurring in San Joaquin County groundwater. Data from the US Environmental Protection Agency (USEPA) indicate that the DIWET levels for arsenic are below background levels of arsenic found in San Joaquin County. USEPA data from San Joaquin County public water systems collected from 1980 to 1998 indicate average concentrations of arsenic of 8.95 µg/L. Therefore, the average concentrations of arsenic, as measured by USEPA well sampling, are higher in the San Joaquin County groundwater than in sample DIWET analysis.

Soluble constituents from the dredged material have the potential to migrate downwards towards the underlying groundwater. As the leachate migrates through the soil towards the groundwater, a degree of attenuation will occur based on environmental fate processes that include adsorption to clay and organic matter, chemical bonding of metals to soil particles, and filtration of suspended matter by fine textured soil particles. The degree of expected attenuation is dependent on soil characteristics specific to individual sites. An analysis conducted by Geomatrix Consultants Inc. of 16 soil samples taken in RN1 in October 2003, indicates relatively high soil cation exchange capacities ranging from 8.3 to 32.3 meq/100 g soil.

In evaluating the potential for lead to impact groundwater quality, staff reviewed DIWET lead data from previous dredging operations as well as the available groundwater data from RN1. Measured DIWET lead concentrations have been significantly higher (average 27.7 µg/L) in several dredged spoil placements at RN1 since 2003, and subsequent groundwater data does not show lead to have impacted the groundwater. Based on the CEC at this site and data from material with higher levels of DIWET lead previously placed at this site, lead concentrations are not expected to impact groundwater. In order to provide an additional factor of safety to the conclusions of previous findings concerning the potential threat from lead and arsenic, this Order requires removal of dredged solids by 31 October 2007. To verify groundwater protection, the Discharger is required to continue groundwater monitoring.

### **Potential Surface Water Impacts**

Dredging operations will result in the suspension of sediment, which will contribute to an increase in the surface water turbidity. The Discharger has evaluated the potential turbidity contributions from the dredging operation. The RWD indicates that the background turbidity

near the West Complex may range between 15 to 30 Nephelometric Turbidity Units (NTU) during the dredging season. The Basin Plan specifies that turbidity shall not be increased by more than 20 percent, where natural turbidity ranges between 5 and 50 NTU. The Discharger has calculated that suspended solids are estimated to increase by 1.9 mg/L, and that turbidity is estimated to increase from 19 to 20.9 NTU. Based on these calculations, the Basin Plan's turbidity objective would not be exceeded.

## **Discharge Prohibitions**

### *Discharge Prohibition A.1*

Discharge Prohibition A.1 prohibits the discharges from causing or contributing to acute toxicity in the receiving waters. The Basin Plan requires that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal or aquatic life. Water column effects occur when contaminants on the sediment particles are either dissolved or suspended in the water column as a result of the dredging operation. The Basin Plan states that *“all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.”* The Basin Plan requires that *“as a minimum, compliance with this objective...shall be evaluated with a 96-hour bioassay.”* This Order requires acute toxicity testing if the dredge operation monitoring for turbidity indicates that the turbidity objective has been exceeded 100 feet down-current of the dredging operation.

### *Discharge Prohibitions A.2 and A.3*

Discharge Prohibitions A.2 and A.3 restrict the discharge of dredged material, including both solids and water, to RN1, Areas B and C. The discharge of dredged materials and untreated or partially treated waste outside Areas B and C has the potential to impact surface and groundwater quality.

### *Discharge Prohibition A.5 and A.6*

The Basin Plan contains objectives for petroleum products, floating material and oil/grease. These discharge prohibitions, based on the Basin Plan oil/grease and floating material objectives, have been included in this Order.

### *Discharge Prohibition A.7*

The Basin Plan includes a water quality objective for surface waters that the *“...pH shall not be depressed below 6.5 nor raised above 8.5.”* Dredging operations have the reasonable potential to affect pH as previously anaerobic sediments are oxidized in the excavation process. The Delta waters are subject to tidal influence and seasonal water pumping that may affect flow direction. Therefore, no reliable dilution is available in the receiving stream, so this Order includes in-stream limitations for pH at the Basin Plan objective values.

*Discharge Prohibition A.8*

The Basin Plan contains an objective for turbidity. Dredging operations have the potential to increase turbidity as material is suspended in the water column. The Basin Plan states that:

- (a) where natural turbidity is between 0 and 5 NTUs, increases shall not exceed 1 NTU;
- (b) where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
- (c) where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs; and
- (d) where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

*Exceptions to the Delta specific objective will be considered when dredging operations can cause an increase in turbidity. In this case, an allowable zone of dilution within which turbidity in excess of the limits can be tolerated will be defined for the operation and prescribed in a discharge permit.”* In order to allow a zone of dilution, the point of compliance with the turbidity limitation for the dredge operation, i.e. cutterhead, shall be 100 feet down-current of the dredging operation. This discharge prohibition limit is based on the Basin Plan turbidity objective.

*Discharge Prohibition A.9*

Sediments contain organic material and ammonia. Ammonia is known to cause toxicity to aquatic organisms in surface waters. The Basin Plan contains a narrative toxicity objective for surface water. USEPA has developed Ambient Water Quality Criteria for ammonia, which is dependent on pH and the presence of salmonids. Because salmonids may be present in the Delta during dredging operations, an in-stream limitation, based on the Ambient Water Quality Criteria for ammonia with salmonids present, as described in Attachment D, has been included in this Order consistent with the Policy for Application of Water Quality Objectives.

*Discharge Prohibition A.10*

The Basin Plan contains a chemical constituent objective for copper of 10 µg/L in the Sacramento-San Joaquin Delta. In addition, the California Toxics Rule (CTR) contains criteria for protection of freshwater aquatic life that vary with hardness. Below a hardness of 120 mg/L as CaCO<sub>3</sub>, the 4-day average CTR criterion is more stringent than the Basin Plan objective. Applying the Policy for Application of Water Quality Objectives, an in-stream limitation for copper, down-current from the cutterhead, based on the Basin Plan chemical constituents objective and the CTR criteria, as described in Attachment E, has been included in this Order.

*Discharge Prohibition A.11*

The Basin Plan contains a chemical constituent objective for arsenic of 10 µg/L in the Sacramento-San Joaquin Delta. Therefore, an in-stream limitation for arsenic, based on the Basin Plan chemical constituents objective, has been included in this Order.

*Discharge Prohibition A.12*

The Basin Plan contains a chemical constituent objective for barium of 100 µg/L in the Sacramento-San Joaquin Delta. Therefore, an in-stream limitation for barium, based on the Basin Plan chemical constituents objective, has been included in this Order.

*Discharge Prohibition A.13*

The CTR limit for mercury is 0.05 µg/L for sources of drinking water. Applying the Policy for Application of Water Quality Objectives, an in-stream limitation for mercury, based on the CTR and presented in total concentration, has been included in this Order.

*Discharge Prohibition A.14*

The Basin Plan prohibits chemicals from being present in surface waters in toxic concentrations. The Cal/EPA Office of Environmental Health Hazard Assessment has published a Public Health Goal of 2.0 µg/L for lead in drinking water. Beneficial uses of the Sacramento-San Joaquin Delta include municipal and domestic supply, which includes drinking water uses. Applying the Policy for Application of Water Quality Objectives, an in-stream limitation for lead, based on the Public Health Goal and presented in total concentration, has been included in this Order.

*Discharge Prohibition A.18*

The Basin Plan contains a pesticide objective for OC pesticides. The Basin Plan states, “*Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by either the EPA or the Executive Officer.*” This Order contains an in-stream limitation, based on the Basin Plan pesticide objective prohibiting OC pesticides at concentrations detectable within the accuracy of analytical methods.

**Discharge Specifications**

*Discharge Specification B.6*

It is appropriate to require a minimum of two feet of freeboard at all times to minimize the potential for overflows.

*Discharge Specifications B.9 and B.10*

Dredging operations in the Stockton DWSC have the potential to exacerbate the existing low dissolved oxygen impairment in this CWA 303(d) listed water body. In order to mitigate for this potential, aeration devices shall be operated on a continual basis by the discharger to supply 2,500 pounds of oxygen per day as specified in Attachment B, and during the dredging operation to supply 500 pounds of oxygen per day while dredging operations are underway.

*Discharge Specification B.11*

The Discharger has conducted magnetometer and side sonar scans of the project area in order to locate significant submerged or buried metallic objects. These surveys have identified widespread submerged metallic debris buried in the sediment near the docks, which are believed to be associated with past U.S. Navy activity. In order to remove these metallic anomalies with a

minimum disturbance of sediments, this Order specifies that the removal of these objects be accomplished with gentle discreet movements of the lifting crane, removal of adjacent sediment with hydraulic suction, and the assistance of divers when appropriate.

### **RN1 – Soil Limitations**

#### *RN1– Soil Limitation D.1*

In order to ensure there will be no-long term effects from the placement of dredged sediment at RN1, this Order limits the placement of dredged spoils on RN1 to a temporary period ending 31 October 2007. In addition, placement and reuse of this material shall be limited to uses in which there is no reasonable potential for impacts to groundwaters. Therefore, placement and reuse is limited to use as foundation material beneath engineered covers, such as buildings, foundation slabs, parking lots or roadways; and at least two feet above any significant groundwater bearing zone.

### **Monitoring and Reporting Program**

Section 13267 of the California Water Code (CWC) authorizes the Regional Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the state. The emphasis has been on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment of civil administrative liability where appropriate.

The Monitoring and Reporting Program (MRP) requires monitoring for the dredging operation, confined disposal facility, dredged sediment and the newly exposed sediment horizon in the San Joaquin River. The MRP also requires extensive on-going ground water monitoring to assure that any leachate from the dredged material is not impacting groundwater quality.