DREDGER'S HANDBOOK

A TESTING, PERMITTING, AND REPORTING GUIDE FOR MAINTENANCE DREDGING IN THE SAN FRANCISCO BAY

JANUARY 2021

LTMS Program Agencies

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION
SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD
U.S. ARMY CORPS OF ENGINEERS, SAN FRANCISCO DISTRICT
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 9

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ACRONYMS

AA	Alternatives Analysis
BCDC	San Francisco Bay Conservation and Development Commission
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CSLC	California State Lands Commission
CWA	Clean Water Act
DMMO	Dredge Material Management Office
DOP	Dredge Operation Plan
EFH	Essential Fish Habitat
IAA	Integrated Alternatives Analysis
ITM	Inland Testing Manual
LTMS	Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OTM	Ocean Testing Manual
SDPAA	Small Dredger Programmatic Alternatives Analysis
SAP	Sampling and Analysis Plan
SAR	Sampling and Analysis Report
SAV	Submerged Aquatic Vegetation
SF-8	San Francisco Bar Disposal Site
SFDODS	San Francisco Deep Ocean Disposal Site
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SFEI	San Francisco Estuary Institute
TMDL	Total Maximum Daily Load
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

INTRODUCTION

Welcome to the Dredgers' Handbook! The Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) agencies have prepared this document as a general guide to assist applicants and permittees in the permitting, sediment characterization, and episode approval processes for dredging and dredged sediment placement in the San Francisco Bay Region (region). The geographic extent of the LTMS Program planning area is shown in **Figure 1**. This document provides an overview of these processes and explains overarching concepts involved in permitting navigation dredging and placement of the dredged sediment; it also provides links to additional resources.

This document is not regulatory in nature, rather it is provided as a resource to assist applicants and permittees. The Handbook is not binding on the LTMS agencies in any specific case or determinative of the issues addressed in the document. The LTMS agencies retain complete discretion to take action for any given dredging proposal based on their respective laws, policies, and regulations as applied to the facts then-presented.

LTMS Program

The San Francisco Bay Conservation and Development Commission (BCDC), the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), the State Water Quality Control Board (State Board), the California State Lands Commission (CSLC), the San Francisco District of the U.S. Army Corps of Engineers (USACE), and the U.S. Environmental Protection Agency (USEPA) worked with stakeholders, including the dredging industry, oil companies, maritime businesses and the Ports, fishers, and environmental organizations, as well as the resources agencies – California Department of Fish and Wildlife (CDFW), the U.S. Fish and Wildlife Service (USFWS), and

Figure 1. LTMS Planning Area; *Source: Final LTMS EIS/R 1998*

the National Oceanic and Atmospheric Administration (NOAA)'s National Marine Fisheries Service (NMFS) to respond to concerns regarding potential direct, indirect and cumulative impacts from dredging and dredged sediment placement to water quality, wildlife and human uses of the Bay through the formation of the LTMS program. The LTMS Goals are to:

- maintain in an economically and environmentally sound manner those channels necessary for navigation in San Francisco Bay and Estuary and eliminate unnecessary dredging activities in the Bay and Estuary;
- conduct dredged material placement in the most environmentally sound manner;
- maximize the use of dredged material as a resource; and
- establish a cooperative permitting framework for dredging and dredged material placement applications.

The LTMS Management Plan was adpoted in 2001 (Management Plan) and the LTMS Program consists of:

- the Dredged Material Management Office (DMMO);
- a single DMMO application for use by the community when requesting dredging and dredged sediment placement permits;
- an improved regional testing program;
- the long-term goals of maximizing the beneficial use of dredged sediment, minimizing in-Bay placement, and using the San Francisco Deep Ocean Disposal Site (SFDODS) as a stopgap measure while beneficial reuse sites were being developed;
- a completed twelve-year transition period to work toward these goals;
- a twenty percent of the total dredged sediment limit for in-Bay placement sites, based on a three-year average; and
- the programmatic consultations and environmental work windows to protect special status species and their habitat.

These actions streamlined agency and applicant efforts for dredging and placement projects in the region. Moreover, the LTMS agencies continue to improve the program as opportunities are identified to this day. Throughout this handbook the "LTMS agencies" include BCDC, SFBRWQCB, CSLC, USEPA, and USACE, as they are the signatories to the Management Plan. The "resource agencies" include CDFW, USFWS, and NOAA NMFS, who consult as needed on resource issues. For more information on the history of the LTMS and DMMO, see the LTMS EIS/EIR[1] and Management Plan[2].

1 LTMS EIS/EIR (1998); https://www.spn.usace.army.mil/Missions/Dredging-Work-Permits/LTMS/

2 LTMS Management Plan (2001); https://www.spn.usace.army.mil/Portals/68/docs/Dredging/LMTS/entire%20LMTF.pdf

DMMO

The DMMO interfaces with the dredging projects through its one-stop shop that meets twice a month on Wednesdays to: (1) review and approve sediment testing programs and suitability determinations for dredge projects, and (2) support dredging and dredged sediment placement in the region. The DMMO is an interagency virtual office comprised of representatives of BCDC, SFBRWQCB, USACE, and USEPA (DMMO agencies); CSLC and state and federal wildlife agencies may attend meetings when needed. It was created to facilitate coordinated review of sediment quality data of dredge projects and to increase efficiencies for each permit (or authorization) decision in the region. The DMMO agencies work together at public meetings to review and approve sediment sampling and analysis plans, test results, and placement alternatives and to make suitability determinations. The DMMO also jointly reviews permit applications. Joint review affords the opportunity for the agencies to issue permits that are consistent with the LTMS Program goals and commitments. This process also provides consistency and certainty for the dredging, fishing, and environmental communities while ensuring compliance with the resource agencies' biological opinions, incidental take permits, and streambed alteration agreements.

DMMO Meetings

Occur on Wednesdays every 2 weeks. Documents are required by 5pm the Wednesday before the meeting so that agencies have time to review submitted materials.

DMMO Process Overview

Sediment characterization and permits can be pursued simultaneously, or sequentially, however, permits and permit amendments cannot be issued without first completing sediment testing for the first episode. The sediment characterization is necessary for the permitting agencies to understand the physical, chemical, and biological sediment quality of the areas to be dredged, which allows appropriate conditions to be incorporated into permits. Whether the applicant chooses to first undertake testing or submit a permit application is at their discretion. Often the sampling and analysis plan is submitted before or along with an application due to the length of time that it takes to complete the testing process and the need for test results to make the application be considered

Maintenance Dredging

Dredging in a berth, marina, or channel that was previously dredged to the same depth and width. Relatively soft, unconsolidated, accumulated sediment is typically removed from regularly dredged areas.

New Work Dredging

Dredging an area that has never been dredged, has not been dredged in a significantly long period of time, or areas that are being deepened or widened. The LTMS agencies have used a period of 20 years or greater as a threshold after which a project may be considered new work. Sediment from new work projects often exhibit low-moisture, consolidated material, historic marine or riverine sediment deposits, and/or ecologically stable environments.

complete. This is helpful when the proposed project:

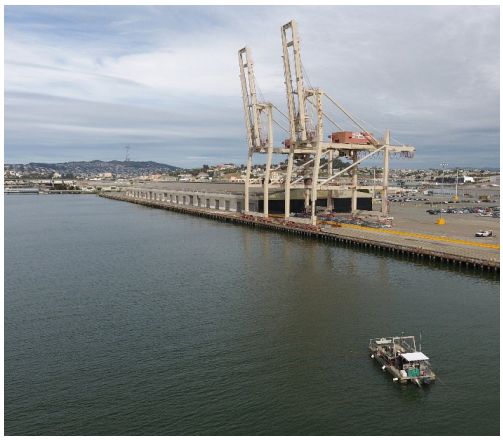
1. is new work;
2. has an expired maintenance permit; or
3. requires a maintenance permit amendment.

If the project is new work, the sediment characterization is often done in advance of application submittal because the test results assist the applicant in defining the project and the likely placement options.

If the proposed maintenance dredging project has valid permits, a new application and public notice will not be needed. Instead, an episode approval will be sought under the existing permits. In this case, the permittee may prepare and submit a:

1. Tier I exclusion from testing request (defined in "Sediment Characterization" section); or
2. sediment Sampling and Analysis Plan (SAP).

The flowcharts shown in **Figure 2** provide an overview of the steps associated with the sediment characterization, permitting, and episode approval for dredging projects in San Francisco Bay.



There are various water-related industries for which navigation dredging is essential, these include (1) marinas, (2) shipping, and (3) oil terminals.

Credit (left to right):

1. *Dredging at Blue Water Yacht Harbor; Photo – Brian Ross, USEPA (2016); Equipment – Salt River Construction*
2. *Sediment sampling at Pier 80; Photo – Port of San Francisco (2017); Equipment: vessel and vibracore operations – TEG Oceanographic, on vessel core logging and sample processing – New Fields*
3. *Dredging at Chevron Long Wharf; Photo – Josh Gravenmier, Arcadis (2013); Equipment – Dutra Dredging Company*

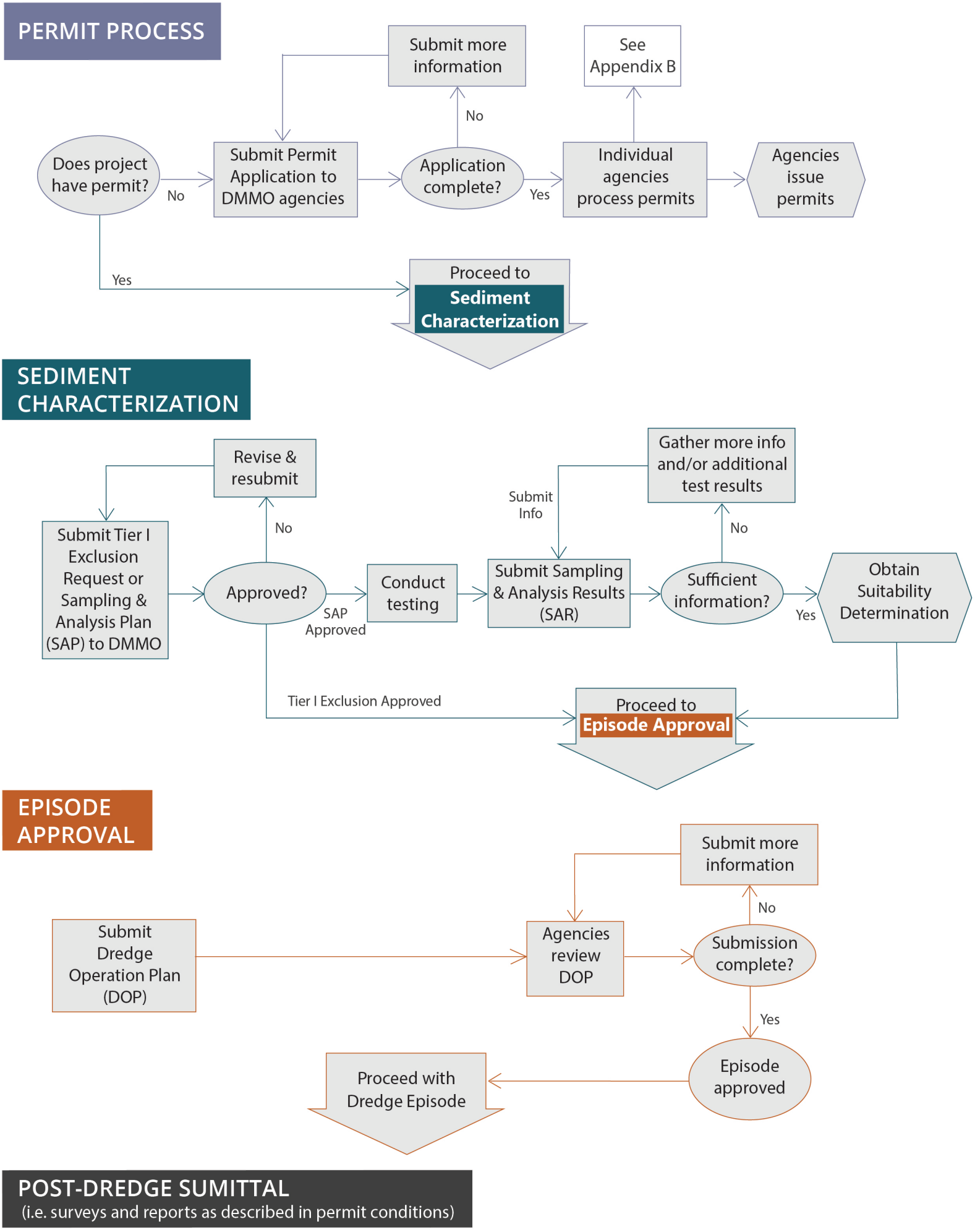


Figure 2. Project Review and Authorization by DMMO Agencies; *Source: modified from LTMS Management Plan (2001)*

PERMIT PROCESS

When requesting a permit to dredge or place dredged sediment in the Bay Area, applicants should use the "Consolidated Dredging, Dredged Material Reuse, and Disposal Application" (the DMMO application). This application was developed to gather the information that all DMMO agencies need to make a permit decision. Each LTMS agency (BCDC, SFBRWQCB, CSLC, USEPA, and USACE) retains its own permitting authority (see Appendix B), but coordinates on decisions and special conditions when appropriate.

The applicant fills out and signs the DMMO application once and submits a copy to the relevant agencies. The applicant should clearly describe the project and may attach project plans and additional details when the application is submitted. Once received, the DMMO agencies begin processing the permit and may request additional information or clarification. The request for additional information will be provided within 30 days of submittal. If a DMMO agency requests additional information, this information should be provided by the applicant as soon as possible. Any changes to the application should be provided to all the relevant agencies so that they are all working with the same project information. Applicable permit fees should be provided directly to the respective agency. Information on the consolidated DMMO application form can be found online[1].

The LTMS agencies can issue permits for up to ten years for single or multiple dredge episodes. Due to the amount of work involved in issuing a permit it is recommended that the applicant apply for a ten-year permit whenever appropriate. If the permit is for a single episode, the project description should reflect that. When requesting a multi-year and multi-episode permit, the applicant must estimate:

- the number of episodes;
- the likely total volume that would be dredged and placed (including over-depth);
- the type of equipment and sediment placement location(s); and
- the total cost associated with the full proposal – including sediment testing.

The total volume proposed for dredging should be based on the sedimentation rate that has been observed at the site using an evaluation of past bathymetric surveys.

Once all the requested information is provided, the permit is filed complete and the permitting agency works with the applicant to finalize the authorization and permit requirements. If a complete application is submitted, permits can usually be expected within 60 days. However, the broader permitting process, which includes conducting all testing, submitting applications and reports, and revising documents generally takes four to 18 months depending on:

- how quickly information is provided;
- the testing schedule;
- any complications resulting from elevated levels of contamination; and
- the workload of the permitting agency.

1 Consolidated Dredging, Dredged Material Reuse, and Disposal Application, accessed January 2021; https://www.spn.usace.army.mil/Missions/Dredging-Work-Permits/Application/

Identifying Appropriate Agencies

REGULATORY & RESOURCE AGENCY ROLES

All maintenance navigation dredging projects in the Bay are governed by the LTMS Program. Permits are required from three agencies (SFRWQCB, BCDC, and USACE) and a CSLC lease is necessary if the project is on state-owned tidelands. If ocean disposal is involved, USEPA concurrence is required, and within State Waters outside the Bay (three-mile state limit) the CCC has jurisdiction and shoudl be consulted. Further, the USACE consults the federal resource agencies on projects under the authority of the federal Endangered Species Act (ESA). CDFW must be consulted under the California ESA and for alterations of lakes and streambeds. A short description of each agency's permit process can be found in Appendix B. The following are the authorizing documents issued by each DMMO agency:

CALIFORNIA STATE LANDS COMMISSION (CSLC) • State Lands Commission lease – if the project is on tidal and submerged lands as well as the beds of natural navigable rivers, streams, lakes, bays, estuaries, inlets, and straits of the state

SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD (SFBRWQCB) • Section 401 Quality Certification and Porter Cologne Waste Discharge Requirements

SAN FRANCISCO BAY CONSERVATION & DEVELOPMENT COMMISSION (BCDC) • McAteer-Petris Act and/or Suisun Marsh Preservation Act dredging and disposal permit, federal consistency determinations (federal projects)

U.S. ARMY CORPS OF ENGINEERS (USACE) • Clean Water Act (CWA) Section 404, Marine Protection, Research and Sanctuaries Act (MPRSA) Section 103, and RHA Section 10 permits for dredging and disposal

U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA) • Oversees Section 404 (USACE) permit, suitability determinations, MPRSA concurrence and compliance, and provides authorization for disposal at designated Ocean Disposal Sites

CALIFORNIA COASTAL COMMISSION (CCC) • California Coastal Act – disposal at the San Francisco Bar Disposal Site (SF-8), federal consistency determinations (federal projects)

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE (CDFW) • Incidental Take Permit if the project would incidentally take state-listed species. Lake and Streambed Alteration Agreement if the project is in a tributary of the Bay. Pacific herring waivers for dredging outside the environmental work window in certain parts of the Bay

U.S. FISH & WILDLIFE SERVICE (USFWS) & NATIONAL MARINE FISHERIES SERVICE (NMFS) • USFWS and NFMS provide an advisory role to the DMMO, and issued Programmatic biological opinions regarding endangered species and consultation for Essential Fish Habitat for the LTMS Program

All agencies strive to complete the permitting process as quickly as possible so that dredging projects can get underway during the same year and within the environmental work window. It is a good idea to request a new or amended permit the year before the planned dredging event.

LTMS Program Permit Components

All maintenance navigation dredging in the Bay Area is subject to the LTMS Program. As part of the LTMS Program, dredging projects are afforded efficiencies that streamline the regulatory actions and requirements. This section describes these efficiencies and resulting benefits of the program for the applicants. Briefly, they include programmatic biological opinions for the state and federal Endangered Species Acts from the resource agencies (NMFS, USFWS, and CDFW) resulting in environmental work windows; a NMFS programmatic consultation for Essential Fish Habitat (EFH) resulting in permit conditions to reduce impacts to eelgrass and bioaccumulation triggers for in-Bay placement; a small dredger programmatic alternatives analysis resulting in more efficient ways of meeting the LTMS goals; and the DMMO virtual office. Each of these programmatic efforts allow projects to move fairly quickly through the permitting process, provide certainty in the permit conditions, and provide a course of action when a project has complicating factors.

Programmatic Biological Opinions & Environmental Work Windows

Appendix F of the LTMS Management Plan (2001)[2], contains a summary of the resulting biological opinions from CDFW (November 30, 1998), USFWS (March 12, 1999) and consultations from NMFS (September 18, 1998). These documents set forth the environmental work windows for dredging and placement of dredged sediments in the Bay Area as initially created. However, as a result of amended biological opinions and consultations, these work windows have been updated as described below and summarized in the chart provided in Appendix C. The goal of the environmental work windows is to reduce impacts from dredging and placement activities to special status species. In planning dredging projects, applicants should review the environmental work windows chart (see Appendix C) for the area and species that could be affected at different times of the year. If the project is in a tributary or near a marsh, additional restrictions apply. The DMMO can assist applicants if identifying the project's work window is challenging.

WORKING WITHIN THE ENVIRONMENTAL WORK WINDOWS • The environmental work windows encourage projects to work when special status species are not present. Projects that start and finish within the programmatic work windows generally do not need to request consultation from CDFW, USFWS, or NMFS.

PLANNED WORK OUTSIDE THE WORK WINDOWS • The 2015 amended NMFS LTMS programmatic biological opinion allows for planned dredging projects outside of the salmonid work window if the dredged sediment is placed at a beneficial reuse site, or

2 LTMS Management Plan (2001); https://www.spn.usace.army.mil/Portals/68/docs/Dredging/LMTS/entire%20LMTF.pdf

if an equal amount of dredged sediment is placed at a beneficial reuse site within the next dredging season. To discuss this provision or request work outside of the salmonid work window, contact the DMMO agencies. Work in areas with Delta smelt outside of the work window (August 1st to November 30th) requires individual consultation with USFWS through USACE and likely, an Incidental Take Permit from CDFW.

PACIFIC HERRING WORK WINDOW CONSIDERATION • Dredging along the San Francisco waterfront and Richardson Bay are generally not granted extensions due to the consistency and magnitude of herring spawning activity in these areas. If the applicant is proposing to dredge outside of the herring environmental work window (March 16th through November 30th of any year), the applicant should contact the DMMO agencies for a work window extension and CDFW to request a herring waiver. If obtained, the applicant is required to submit the herring waiver to the DMMO agencies. Generally if a herring waiver is granted, the applicant would be required to provide herring observers to look for spawning activity near the dredge. If spawning activity is observed, the project would be required to stop for 14 to 21 days and CDFW would determine when dredging could start again.

UNFORESEEN CIRCUMSTANCES • Ongoing dredging projects that need additional time to finish due to unforeseen delays can request a short time extension to the environmental work windows through the LTMS agencies. The LTMS agencies can authorize limited extensions but must balance requests across the region such that they cumulatively would not exceed 50,000 cubic yards. These extensions have limitations on volume, equipment type, and location, based on potential effects to special status species. Consultation should be requested as soon as possible once a need to dredge outside the window has been determined. Permission to work outside the work window is not always granted and the project may be suspended until the environmental work windows open the following year. The LTMS agencies have developed a short form that the applicant can use to assist in informal discussions regarding time extensions[3].

Mechanical Dredge:
Clamshell and excavator mounted on a crane.

Hydraulic Dredge:
Cutterhead pipeline, hydraulic hopper dredge.

INDIVIDUAL CONSULTATION • When projects cannot be conducted within the environmental work windows set forth in the LTMS programmatic biological opinions, individual consultations are necessary if there is potential to impact special status species. Section 7 of the Endangered Species Act of 1973 calls for interagency cooperation to ensure the actions federal agencies take or authorize do not jeopardize federally-listed species. Under Section 7, USACE coordinates with the federal resource agencies (USFWS and NMFS) as part of the permit application process for these projects. The applicant consults directly with CDFW for state-listed special status species and may need to obtain an incidental take permit or lake and streambed alteration permit. Once consultation is complete, the results of the consultation will be reviewed by USACE, BCDC and the SFBRWQCB prior to approving any dredging or placement outside of the work window.

3 LTMS Environmental Work Windows Informal Consultation Preparation Packet (2004); https://www.spn.usace.army.mil/Portals/68/docs/Dredging/guidance/informal.pdf

For more in-depth information, the project applicant can review the programmatic biological opinions and associated memorandums listed below. **Table 1** provides the most recent opinions and clarifications.

Table 1. Resource Agencies' updates to Environmental Work Windows

Agency	Date	Amendment Content	Links
USFWS	May 2004	Biological Opinion: Least tern and Delta smelt	https://www.spn.usace.army.mil/Portals/68/docs/Dredging/LMTS/document2012-03-06-121642.pdf
NMFS	July 2015	Biological Opinion: green sturgeon, flexibility for salmon work window	https://www.spn.usace.army.mil/Portals/68/docs/Dredging/LMTS/LTMS%20NMFS%20BiOp%20Revision%202015.pdf and https://www.spn.usace.army.mil/Portals/68/docs/Dredging/LMTS/LTMS%20NMFS%20BiOp%207_9_2015.pdf
CDFW	September 2020	CDFW recommendations to LTMS agencies regarding Pacific herring and Dungeness crab	https://www.spn.usace.army.mil/Portals/68/docs/Dredging/LMTS/LTMS_California_Department_of_Fish_and_Game_Biological_Opinion.pdf

Further review of the original opinions found on the USACE LTMS webpage[4] may be needed to fully understand the environmental work window requirements.

LTMS Programmatic Essential Fish Habitat (EFH) Agreement

Z-layer
Sediment sampled six inches below the project's over-depth allowance to determine whether newly exposed sediment after dredging would have an effect on essential fish habitat.

The Magnuson-Stevens Fisheries Conservation and Management Act defines EFH as the habitat necessary for fish to spawn, breed, feed, or grow to maturity. NMFS has designated San Francisco Bay as EFH for three fisheries, Pacific Coast Groundfish, Pacific Coast Pelagic, and Pacific Coast Salmon, thus projects that affect EFH, such as dredging and dredged sediment placement, require consultation with NMFS. In June of 2011, the USACE and USEPA issued a final agreement with NMFS entitled, "Agreement on Programmatic EFH Conservation Measures for Maintenance Dredging Conducted Under the LTMS Program[5] (Tracking Number 2009/06769)". This agreement sets forth minimization and mitigation measures for dredging and sediment placement projects working within the LTMS Program including:

4 USACE LTMS Main Page, accessed January 2021; https://www.spn.usace.army.mil/Missions/Dredging-Work-Permits/LTMS/

5 Agreement on Programmatic EFH Conservation Measures for Maintenance Dredging Conducted Under the LTMS Program (2011); https://www.spn.usace.army.mil/Portals/68/docs/Dredging/LMTS/LTMS%20EFH%20full%20signed%20agreement%20FINAL%206-9-2011.pdf

- identifying residual contaminants exposed after dredging (i.e. 'Z-layer' characterization);
- bioaccumulation testing where there are elevated levels of contaminants; and
- minimizing potential adverse effects to eelgrass and other submerged aquatic vegetation (SAV).

Regarding the residual contaminant measures, the DMMO requires that Z-layer samples be taken and archived. If the sediment proposed for dredging has elevated levels of contaminants, then the archived Z-layer samples will be tested to determine if the newly exposed area has elevated levels of contaminants harmful to fish and their prey. If so, additional minimization measures may be required, following discussion with NMFS staff.

The EFH consultation also sets bioaccumulation triggers for specific chemicals – PAHs, PCBs, DDTs, chlordane, dieldrin, dioxins/furans, and mercury. Bioaccumulation trigger values are updated regularly for each chemical and can be found on the San Francisco Estuary Institute (SFEI) website. If sediment chemistry exceeds the bioaccumulation triggers and the sediment is proposed for in-Bay placement, bioaccumulation testing is required (NOTE: since 2012, testing is no longer required for exceedance of the mercury bioaccumulation trigger). If the contaminants show bioaccumulation above a toxicity reference value, the DMMO will make a decision regarding an appropriate placement site.

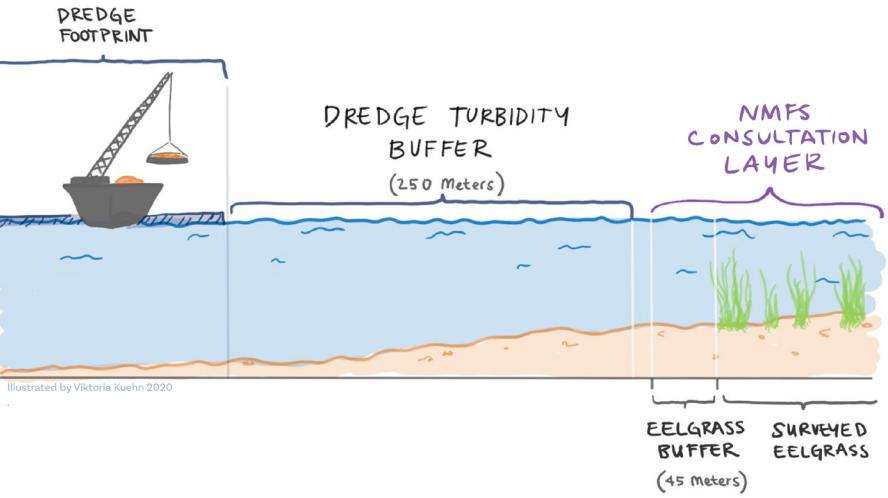
The conservation recommendations in the EFH agreement also include minimization measures to reduce the impact of dredging on eelgrass and other submerged aquatic vegetation (SAV). The LTMS agencies have implemented NMFS' recommendations which include the following requirements (**Table 2**).

Table 2. Requirements to reduce impact to SAV based on impact type.

Impact Type	Requirement
Direct Dredging footprint is within eelgrass or within 45 meters of eelgrass	Applicant must conduct pre- and post-dredge eelgrass survey
Indirect Dredging footprint is within 250 meters of eelgrass	Deploy silt curtain; conduct light monitoring during dredging; or demonstrate site hydrodynamics or physical conditions will prevent impacts

If a pre-dredge eelgrass survey finds eelgrass to be occurring within the dredging footprint, a mitigation plan for eelgrass removal will likely be required with the advice of CDFW and NMFS. CDFW also manages eelgrass habitat as an important habitat for herring and prey habitat for California Least terns. Generally, CDFW is in agreement with NMFS conservation recommendations, but may suggest additional minimization measures[6].

6 LTMS Programmatic Essential Fish Habitat Consultation, accessed January 2021; https://www.spn.usace.army.mil/Missions/Dredging-Work-Permits/LTMS/-Programmatic-Essential-Fish-Habitat-Consultation/



A graphic showing the distance a dredge project must be from eelgrass habitat to avoid direct and indirect impacts to this essential fish habitat. *Credit: Viktoria Kuehn*

Alternatives Analysis

Sediment can be placed at authorized aquatic placement sites (including in-Bay and SFDODS) placed at upland facilities, beneficially reused at habitat restoration sites or the San Francisco Bar (SF-8) (projects with sand), or used for levee maintenance or construction where appropriate. The placement location used by a dredging project and the volume of sediment placed depends on the sediment's characteristics, site availability, and feasibility. See Appendix A for a map of dredged sediment placement locations.

As part of the LTMS Program, the dredging community has agreed to the LTMS goals of maximizing beneficial reuse and minimizing in-Bay placement. LTMS goals include limiting in-Bay placement to 20% of the total volume of sediment dredged from the Bay and maximizing beneficial reuse of dredged sediment. In-Bay placement volumes and beneficial reuse goals are evaluated and averaged every three years to provide flexibility and to allow for interannual variability. Ocean placement is available as an option when in-Bay placement or beneficial reuse is not feasible. If the LTMS goal for in-Bay placement cannot be met, the LTMS agencies would enter a regulatory process to allocate in-Bay placement volumes on a project-by-project basis.

An analysis of feasible alternatives to in-Bay and ocean placement is required to be submitted to the DMMO as part of the permit and episode approval process. The USACE, USEPA, and SFBRWQCB evaluate a project's impact by applying the CWA 404(b)(1) guidelines (see Appendix B). BCDC's dredging policies in the Bay Plan require a feasibility analysis of placement options and seek to maximize beneficial reuse. An integrated or single episode alternative disposal site analysis meets the needs of these guidelines and policies if tiered under the LTMS Program. The LTMS agencies strive to review and respond to the

Sediment Placement Options

Ocean: San Francisco Deep Ocean Disposal Site (SFDODS) is located off the continental shelf 55 nautical miles west of San Francisco.

In-Bay: The four dispersive placement sites are in Suisun Bay (for USACE only), Carquinez Strait, San Pablo Bay, and Alcatraz (Central San Francisco Bay.

Upland: Various upland facilities may be available, including landfill or sites that can manage contaminated sediment when necessary.

Beneficial Reuse: The preferred placement option where sediment can be used for habitat restoration, levee maintenance, sea-level rise adaptation and resilience, and construction projects. Dredged sand can also be placed at the San Francisco Bar site (SF-8).

submitted analysis within 30 days. Instructions for the types of analyses that should be submitted to the DMMO are as follows:

SMALL DREDGER PROGRAMMATIC ALTERNATIVES ANALYSIS (SDPAA) • The SDPAA is for use by small dredgers due to the equipment class size necessary for small projects and the feasibility issues associated with such equipment. The SDPAA is not appropriate for use by small projects that have an upland placement site or other limited circumstances. To use the SDPAA, the applicant should review it to see if their project fits the descriptions and circumstances. If so, the SDPAA form should be signed and provided to the permitting agencies. The full SPDAA and required form can be found online[7].

Dredger Categories

Small: Have a project depth of -12 feet MLLW or less (not including over-depth allowance) and dredge less than 50,000 cy per year on average. Often are recreational marinas and homeowner docks.

Medium: Have a project depth greater than -12 feet MLLW, variable volumes of dredged sediment, and can be single or multi-facility owners. Often are small ports and oil terminals.

Large: Have variable project depths, dredge large volumes, and are usually multiple facility owners. Includes large ports and USACE federal navigation projects.

ALTERNATIVES ANALYSES FOR MEDIUM AND LARGE DREDGERS • Dredgers who do not meet the SDPAA criteria are required to submit either an alternatives analysis for a single episode (AA) or an integrated alternatives analysis (IAA) that evaluates their overall dredging program and options for placement. An AA is generally used when a project dredges very infrequently (less than once every five years) and for single facilities. An IAA is generally used when a project applicant dredges annually, or multiple times within a three- to five-year period, and/or at multiple facilities. When preparing the analysis for submission, it is important to describe: the proposed dredging episode(s), the available placement options, and how the placement program meets the LTMS goals of reducing in-Bay placement and maximizing beneficial reuse. Either analysis type can be submitted to the DMMO, however, it is recommended that an IAA be used for such situations because it provides more flexibility in meeting the LTMS goals. IAAs also benefit dredgers by making the placement program more predictable over a multi-year period. When preparing the analysis for submission, it is important to note that these analyses are tiered under the LTMS Program and should describe:

- the proposed project;
- the period of time that the document covers;
- the available placement options;
- an analysis of the feasibility of each placement option; and
- how the project proposes to meet the LTMS goals.

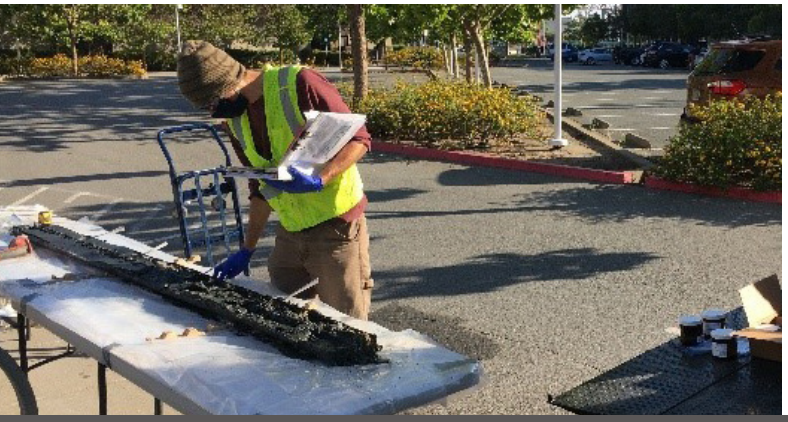
The LTMS agencies request that the first paragraphs summarize the project and the conclusion of the analysis. The LTMS agencies jointly review IAAs and respond to them via letter or email.

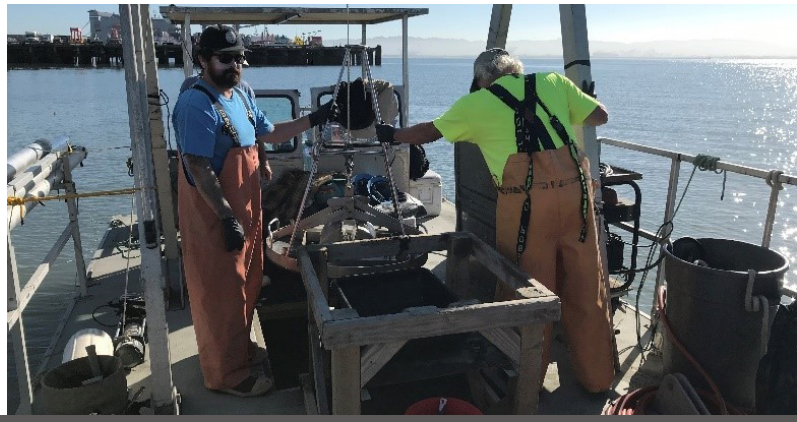
7 SDPAA for Disposal of Maintenance Dredged Material in the San Francisco Bay Region (2004); https://www.spn.usace.army.mil/Portals/68/docs/Dredging/smalldredger%20final.pdf

SEDIMENT CHARACTERIZATION

Sediment proposed to be dredged, placed, or beneficially reused must be characterized to determine whether the sediment is suitable for the proposed placement location or has elevated levels of contaminants that may be acutely toxic or bioaccumulate in species that live in the Bay, ocean, or in tidal marshes (when placed at restoration sites [see Appendix A]). Sediment that does not exceed in-Bay contaminant level screening guidance is often determined to be "suitable for unconfined aquatic placement" i.e., the sediment will be deemed "SUAD." Sediment that exceeds in-Bay placement guidance will be determined "NUAD" (not suitable for unconfined aquatic disposal) and must be placed at an appropriate placement site. Depending on the level of contamination and bioaccumulation potential, sediment may be suitable for placement at beneficial reuse site, often as foundation quality sediment.

The DMMO agencies review the sediment characterization and use a weight-of-evidence approach to make placement suitability determinations. Sediment testing protocols follow procedures set forth by USACE and USEPA in the Inland Testing Manual[1] (ITM) and further refined by Public Notice[2] (PN01-01) for use in San Francisco Bay for in-Bay placement, and the Ocean Testing Manual[3] (OTM) for ocean placement. The national and regional testing programs are tiered, including Tier I to Tier IV. **Table 3** describes the testing tiers, the parameters, and summarizes whether or not a suitability determination can be reached.





A sediment sample after collection *(left)* and a core being taken *(right)* show some field work involved for sediment characterization.

Credit: Photos – Pier 64 Port of San Francisco (2020); Equipment – TEG Oceanographic, Anchor QEA, and AEW Engineering

1 Evaluation of Dredged Material Proposed For Discharge in Waters of the U.S. - Testing Manual Inland Testing Manual (USEPA, USACE [1998]); https://www.epa.gov/sites/production/files/2015-08/documents/inland_testing_manual_0.pdf

2 USACE DMMO Public Notices Site, accessed January 2021; https://www.spn.usace.army.mil/Missions/Dredging-Work-Permits/Current-Public-Notices/

3 Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual (USEPA, USACE [1991]); https://www.epa.gov/sites/production/files/2015-10/documents/green_book.pdf

Table 3. Testing tiers, parameters and ability to reach suitability decision.

Tiers of Testing	Typical Testing Parameters	Ability to Reach Suitability Decision
Tier I	Determination made based on existing information	Yes
Tier I with Confirmatory Chemistry	Analysis of existing data combined with physical or chemical tests to confirm conditions in the dredging area have not changed since the last full testing episode, or if existing data are marginal, old or incomplete	Yes
Tier II	Sediment and water chemistry analysis and modeling	No. Decision cannot be reached at Tier II. This information determines if further testing is needed. The DMMO agencies generally do not use this tier
Tier III	Full suite of routine physical characteristics, chemistry, bioassays, and bioaccumulation	Yes
Tier IV	Reserved for rigorous lab and field testing required on a case-specific basis as prompted by unusual circumstances	Yes

The following discussion outlines the testing required for sediments proposed for placement in-Bay (see Appendix A), at SFDODS, or a beneficial reuse site in the Bay Area.

TIER I EXCLUSION FROM SAMPLING AND TESTING (TIER I)

The purpose of a Tier I is to evaluate whether suitability determinations can be made on the basis of existing information. During the DMMO application process, the applicant should review any previous sampling results and historical information about their dredging project and location to determine if a Tier I request for an exclusion from sediment testing is appropriate. The DMMO reviews the Tier I request and analyzes the existing data and determines if the project can be exempt from testing. In some instances, due to the length of time since dredging has occurred, or minimal data available, the DMMO may require confirmatory physical and chemical analyses to verify that site conditions have not changed (see SAP section below). Generally, projects that have gone three or more years without testing do not qualify for a Tier I Exclusion. The applicant should always consult with the DMMO to determine whether testing will be required when planning their project.

There are two ways a project can receive a Tier I approval: (1) if the sediment qualifies as exclusionary material; and/or (2) if adequate sediment characterization information is available and considered representative of the sediment proposed to be dredged. The conditions for a Tier I approval are defined by USEPA and USACE regulations and are appropriate for sediment with the following characteristics:

1. Sediment is composed primarily of sand, gravel, rock, or any other naturally occurring bottom material with a particle size larger than silt AND is located in areas of high current or wave energy;
2. Sediment is far away from sources of contaminants and/or the dredge area has a historical pattern of low levels of contamination AND the sediment proposed for placement is substantially the same as the substrate at the proposed placement site; AND
3. Sediment volume is small and therefore would not pose a concern at the placement site.

As noted previously, confirmatory chemistry or sediment grain-size analysis may be requested to determine the applicability of the exclusions.

The Essayons releasing sediment suitable for unconfined aquatic disposal via its split hull.

Credit: Photo – Brian Ross (2008); Equipment – Essayons USACE

The DMMO can consider a Tier I under other scenarios depending on the availability of recent testing data from the project site or a project(s) that is in close proximity. The DMMO determines if the data provided is representative of the sediment to be dredged. The data could include sites that were tested in the previous year but not dredged or only partially dredged, and where very minor sediment shoaling has occurred since testing. The information that applicants need to supply for a Tier I decision includes:

- site history;
- nearby sources of contaminants (including storm drains);
- reported spills in the area with a citation for the spill data used (generally found on the California Office of Emergency Services spill database[4]);
- volume proposed to be dredged;
- date of the last dredging event;
- size of the proposed dredge footprint;
- proposed placement site; and
- chart(s) summarizing previous testing data (with inclusion of physical, chemical, and biological test results), including the years in which testing occurred.

In the Tier I request, the information presented should include data from the last three episodes of testing, an analysis of previous findings, and a rationale for the proposed exclusion from testing. If an evaluation of existing data indicates that the dredge site is unlikely to have elevated levels of contaminants, testing may not be necessary. In some cases, inclusion of data from a nearby site may provide additional support for the request and would be considered by the DMMO agencies. Guidance for requesting a Tier I is provided on the USACE's DMMO web page[5].

SAMPLING AND ANALYSIS PLANS (SAP)

If testing is required for a dredging project, a Sampling and Analysis Plan (SAP) should be prepared by the applicant or their consultant. Because this work is technical in nature, the DMMO agencies recommend use of a consultant who is associated with a laboratory that can accomplish the testing. Dredging project applicants should initiate the SAP planning process with the DMMO as early as possible to ensure the SAP will properly characterize the sediment chemistry and any potential biological impacts from the proposed dredging and placement of the dredged sediment. Information that should be in a SAP includes:

- site history;
- nearby sources of contaminants (including storm drains);
- reported spills in the area with a citation for the spill data used;

Biological testing for ocean disposal requires seven species tests; in-Bay and beneficial reuse requires at least three species tests.

4 California Office of Emergency Services Spill Release Reporting site, accessed January 2021; https://www.caloes.ca.gov/cal-oes-divisions/fire-rescue/hazardous-materials/spill-release-reporting

5 Guidance for Tier I Deciscions (2000); https://www.spn.usace.army.mil/Portals/68/docs/Dredging/guidance/tier1.pdf

- project summary (the volume proposed to be dredged, the size of the proposed dredge footprint, and the proposed placement site[s]);
- a recent bathymetric map that shows the dredging footprint, the sample locations, and the areas to be composited in the testing regime (see Appendix D for examples);
- sample collection and testing methods, as well as proposed bioassay organisms;
- quality control measures; and
- a chart summarizing previous testing data (with inclusion of physical, chemical, and biological test results), including the years in which testing occurred.

When developing the SAP, sample locations should be placed in areas with the most shoaling or areas that may have the potential for contamination, such as near storm water outfalls. The proposed dredge footprint must also be clearly delineated on the bathymetric survey. The DMMO advises testing the sediment for more than one placement location, as appropriate (i.e. in-Bay, beneficial reuse sites, ocean, and upland). Please review the DMMO SAP guidance[6] and guidelines for implementing the ITM provided on the USACE webpage for further information and details.

Wetland Cover & Foundation Sediment Quality

Wetland surface (cover) sediment: Dredged sediment placed in the biotic zone during a wetland creation or restoration project. Sediment is in contact with wetland flora and fauna and screening guidelines are protective of the most sensitive potential biological receptors that may be exposed to placed sediment, effluent discharge during placement, and leachate after placement.

Wetland foundation (non-cover) sediment: Dredged material used in a wetland creation or restoration project that is covered by surface sediment and is not in contact with wetland flora or fauna. Foundation sediment can be toxic and should be buried with at least three feet of surface sediment. Although biological receptors will not be directly exposed to foundation sediment, leachate from the sediment may be mobile and reach the biotic zone, so screening criteria are protective of leachate exposure.

The SAP must be submitted to the DMMO for review a minimum of one week before the next meeting. The DMMO agencies collaborate and provide comments on the SAP to the applicants at the DMMO meeting. Both applicants and their representatives are encouraged to participate in the DMMO meetings. The outcome of the review will be one of the following:

1. the SAP is approved as is;
2. the SAP is conditionally approved if there are minor changes that can be incorporated into the sampling and analysis report; or
3. the SAP needs to be rewritten and resubmitted due to the extent and nature of corrections and additions. If the document needs revision, it should be re-submitted for review at the next DMMO meeting unless otherwise noted.

Upon approving the SAP, the DMMO, via USACE, will provide an approval letter to the project applicant; then field sampling and laboratory testing of sediment may commence.

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6 Proposed Guidance for Sampling and Analysis Plans (1999) Part A; https://www.spn.usace.army.mil/Portals/68/docs/Dredging/guidance/99-4.pdf and Part B; https://www.spn.usace.army.mil/Portals/68/docs/Dredging/Public%20Notices/99-4b.pdf

SAMPLING AND ANALYSIS REPORT (SAR)

When the test results are complete, a Sampling and Analysis Report (SAR) of the testing data is developed and submitted to the DMMO for review and a suitability determination. The applicant and the DMMO will discuss test results and the DMMO will provide a suitability determination for each of the proposed placement sites. As with the SAP, the DMMO agencies might require revisions to the SAR. In some cases, particularly when high levels of contaminants are encountered in the composite samples and/or Z-layer, the DMMO will request additional higher resolution testing of individual cores to explore other possible suitability options. If ocean placement is proposed or if bioaccumulation triggers are exceeded, bioaccumulation testing will also be required to determine if the contaminants would accumulate in living organisms above a toxicity reference value.

Suitability determinations are made using a weight-of-evidence approach, taking into consideration the physical, chemical, and biological findings of the testing program. For in-Bay placement, comparisons are made between the proposed project's sediment contaminant concentrations and the San Francisco Bay ambient conditions, the placement site reference sample results, the SFBRWQCB's Total Maximum Daily Loads (TMDLs) for specific constituents, bioaccumulation triggers described in NOAA's EFH Consultation (2011) and the effects on the test organisms. For ocean placement, additional considerations include comparisons between the proposed sediment and the SFDODS database, and the outcome of bioassays and bioaccumulation testing.

Sediment proposed for upland or beneficial reuse sites must also meet the site acceptance criteria of the receiving site(s), often codified in a permit or biological opinion. The SFBRWQCB developed draft guidance entitled: "Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines" dated May 20007 (Beneficial Reuse Guidelines), which differentiates between cover and foundation quality sediment and sediment that is fine or coarse grained. The Beneficial Reuse Guidelines for dredged sediment are reviewed and updated periodically for specific chemical constituents, including mercury, PCBs, PAHs, DDT, dieldrin, chlordane, and dioxin based on current findings from the Regional Monitoring Program for Water Quality in San Francisco Bay. The updated Bay ambient values can be found on the SFEI website8.

Once a suitability determination has been made, a suitability determination letter will be sent to the project applicant, and the DMMO agencies will incorporate the suitability determination in their application evaluation. Please note that a sediment suitability determination for placement does not guarantee placement at any given location. The final placement site is authorized through evaluation of placement alternatives, permits, and episode approvals.

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7 Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines (2000); https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/dredging/beneficialreuse.pdf

8 Dredged Material Testing Thresholds for San Francisco Bay Area Sediments Site, accessed January 2021; https://www.sfei.org/projects/dmmo-ambient-sediment-conditions

SUBMTTAL OF DMMO DOCUMENTS

Sediment characterization documents (Tier 1 requests, SAPs and SARs) should be submitted to the DMMO via the DMMO website9 for review at least one week before the desired meeting (i.e. the Wednesday prior to the meeting by 5:00 pm). Detailed instructions on how to upload documents can be found online10. Please note the following requirements:

- **Tier 1 requests, SAPs, and SARs:** Upload an electronic copy of the document in the meeting area of the website.
- **Testing Data:** Current practice is to enter sediment testing results into a specific "DMMO Sediment Testing Data Template" available online. The template is then uploaded to the DMMO website. This ensures that the data can be queried and used both internally and externally.
- Send a hard copy of the documents to BCDC, and two copies to USACE.

If a project has existing permits with sufficient authorized volume for the episode, the applicants may proceed to the next steps by submitting a dredge operation plan to the agencies and obtaining their episode approval to begin dredging.

An offloader may get used for placing dredged sediment at restoration sites, such as this one at Montezuma Wetlands Restoration Project.

Credit: BCDC (2012)

9 San Francisco Bay Dredging and Disposal Database, accessed January 2021; https://www.dmmosfbay.org/

10 San Francisco Bay Dredging and Disposal Database Uploading Instructions Site, accessed January 2021; https://www.dmmosfbay.org/site/alias_dmmo/71024/meeting_area_document_and_data_submittal.aspx

EPISODE APPROVAL

A permit is not an authorization to proceed with dredging or sediment placement. A multi-year permit may allow multiple dredge episodes; however, each episode must be approved individually by the DMMO agencies before any work is conducted. Before a dredge project can begin, the permit conditions require the submittal of pre-dredge information in the form of a dredging plan, a pre-dredge survey, and a solid debris management plan. Those three items are collectively known as a Dredge Operation Plan (DOP). A DOP is submitted to the DMMO agencies; however, it must only be submitted to the USEPA if ocean placement is planned. The details for those submittals (contents and timing) are specified in each agency's permit conditions. However, one document that contains all the necessary information can be submitted to all agencies for review. Once the DOP is reviewed and approved, USACE, BCDC, and SFBRWQCB will provide a written authorization to proceed. For ocean placement, USACE must first request site-use conditions and concurrence from the USEPA prior to authorization. It is the responsibility of the project applicant to provide all required information and to obtain all necessary authorizations prior to dredging operations.

Late Start!

If proposing to start dredging late in the dredge season, evidence that the episode can be completed by the end of the work window may need to be presented in the DOP. Episode approval can be denied, apportioned, or interrupted if there is not sufficient time to complete the episode prior to the close of the work window.

There are four different types of dredge heads, these are shown above and on the following page. Dredge heads include clamshell *(left)* and excavator/dipper *(right)*.

Credit: Left photo – Viktoria Kuehn (2020); Equipment – Lind Marine
Right photo – Viktoria Kuehn (2020); Equipment – Salt River Company

The two other types of dredge heads are shown above, these include the hydraulic *(left)* and cutter *(right)*.

Credit: Left photo – Brian Ross (2016); Equipment - Essayons USACE
Right Photo – USACE Engineer Research and Development Center (2017)

POST-DREDGE SUMITTALS

Within 30 days of completing project dredging and placement, the permittee is required to submit post-dredge information to USACE, BCDC and SFBRWQCB, and additionally to USEPA if ocean placement occurred. This information allows agencies to confirm that the approved dredge project was completed and that there were no major deviations from the authorized project. Typical post-project requirements include:

1. a bathymetric survey of the dredging site with final dredge footprint;
2. the volume dredged;
3. any deviations from the approved project; and
4. the placement location(s).

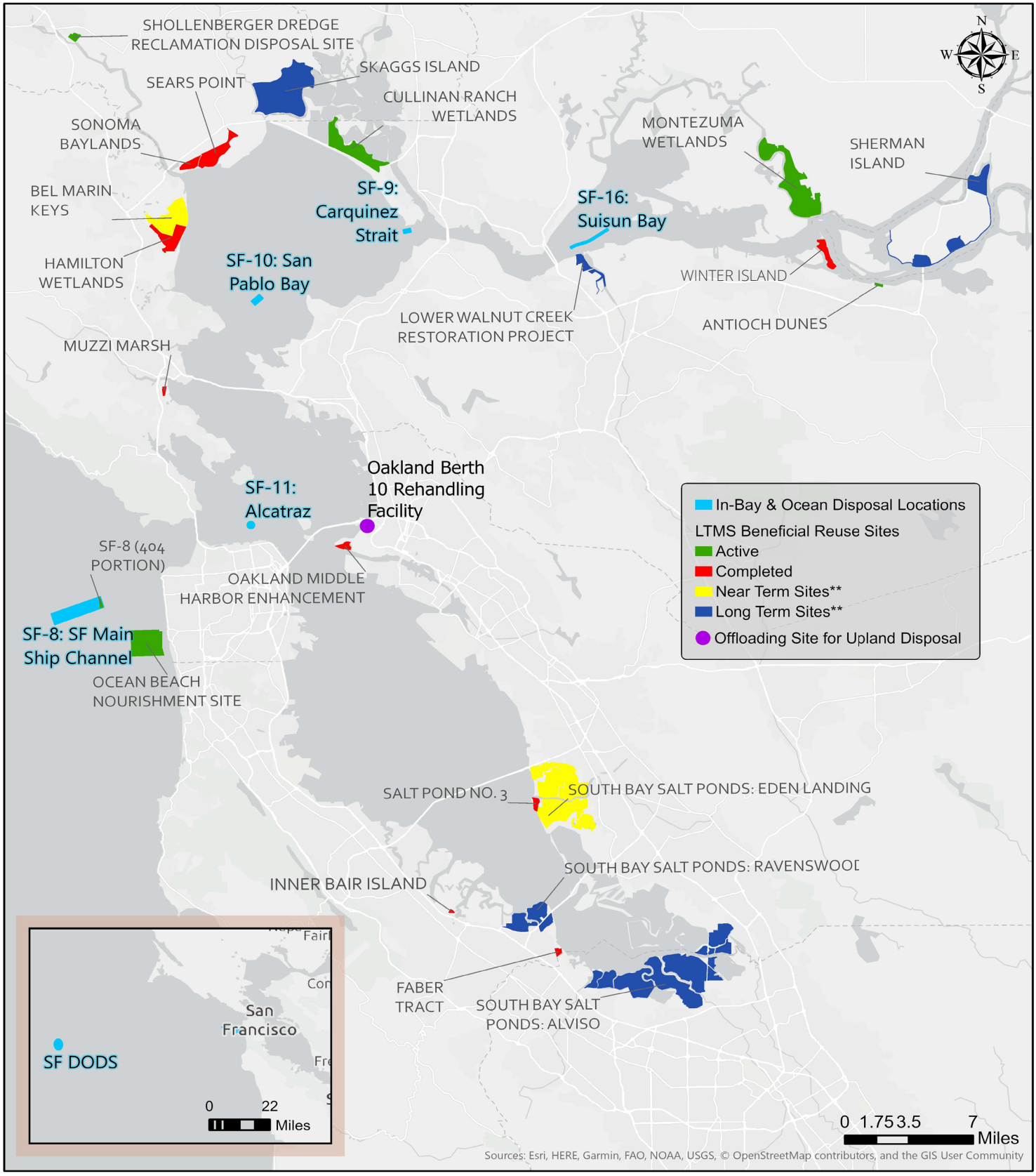
The details of the post-dredge submittals are described in the permit conditions for each agency.

SAN FRANCISCO BAY DREDGER'S HANDBOOK

APPENDIX

CONTENTS

Appendix A | Dredged Sediment Placement Locations



*Sites located within LTMS Program Area, as of May 2020. Does not represent all sites where beneficial reuse is possible or has occurred.

**Preliminarily defined as being available to receive dredged material within the next three years (Near Term Sites) or more than three years (Long Term Sites).

Appendix B | Permitting Agencies Processes

A number of state and federal agencies regulate dredging and dredged sediment placement in the Bay Area. Different laws and regulations govern their roles and responsibilities and often their purposes and goals overlap. The following Table (Table B) describes the basis for regulatory authority and mandates of primary state and federal agencies with jurisdiction over dredging and dredged sediment placement projects. Each subsection of Appendix B provides details for requirements set forth by an individual regulatory agency.

Table B. Basis for Regulatory Authority and Mandates of DMMO Agencies

USACE	USEPA	BCDC	SFBRWQCB	CSLC
Legal Basis for Regulatory Authority				
Clean Water Act (CWA) (33 U.S.S. 151, et seq.)	CWA	McAteer-Petris Act	Porter-Cologne Water Quality Control Act	Ownership of State Lands
Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 (33 U.S.C. 1401-1445)	MPRSA	Suisun March Protection Act	CWA	Public Trust Doctrine
Rivers & Harbors Act of 1899	-	Coastal Zone Management Act	-	-
Mandate for Dredging and Placement Projects Includes				
Regulate placement of dredged sediment or fill material into waters of the U.S.	Maintain integrity of nation's waters	Minimize further filling of the Bay, protect Bay resources	Protect the beneficial uses of waters of the state	Manage state's sovereign lands for purposes consistent with the public trust
Regulate transportation of dredged sediment for the purpose of ocean placement	Oversee placement of dredged sediment, into ocean waters	Protect and manage coastal zone resources of San Francisco Bay	-	Secures and safeguards the public's access rights to natural navigable waterways and coastlines
Protect and maintain navigable capacity of nation's waters	-	Provide for safe navigation and prevent oil spills	-	-

Appendix B1 | SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD

SFBRWQCB Regulatory Authority in Reviewing Proposed Dredged Material Placement in Different Environments					
In-Bay	Ocean	Wetland enhancement[1]	Restoration of diked historic baylands	Upland placement[2]	Landfill
CWA Section 401 Water Quality Certification (WQC) or Waste Discharge Requirements (WDRs) pursuant to Porter-Cologne Water Quality Control Act	Advisory	CWA Section 401 WQC or WDRs pursuant to Porter-Cologne Water Quality Control Act	CWA Section 401 WQC or WDRs pursuant to Porter-Cologne Water Quality Control Act	CWA Section 401 WQC or WDRs pursuant to Porter-Cologne Water Quality Control Act	CWA Section 401 WQC or WDRs pursuant to Porter-Cologne Water Quality Control Act

[1] Existing wetland enhancement

[2] Upland placement other than diked historic baylands, waters of the U.S.

PERMITTING REQUIREMENTS/PROCESS SPECIFIC TO AGENCY • The SFBRWQCB has permitting authority over activities affecting waters of the State and waters of the United States such as the San Francisco Bay, wetlands, creeks, and lagoons. The SFBRWQCB regulates both the dredging activity and the placement of the dredged material via water quality certifications under section 401 of the Clean Water Act (401 Certifications) and waste discharge requirements under section of 13263 of the Water Code (collectively referred to as Dredging Permits). Most Dredging Permits can be issued administratively by the Executive Officer; however, more complex and controversial projects may be taken to our Governor-appointed Board for approval. If the proposed project has components in addition to dredging, such as pile and/or pier replacement, please contact SFBRWQCB staff. Current contacts are listed on the SFBRWQCB's website.[1]

Under the 401 Certification Rule (2020), the project proponent needs to submit a request for a Pre-Filing Meeting a minimum of 30 days prior to submitting an application for a 401 certification. The following are directions on how to submit the Pre-Filing Meeting Request form:

- If the applicant is applying for a single episode 401 water quality certification OR a multi-episode 401 water quality certification with a first episode approval, please fill out the Pre-Filing Meeting Request form and submit it with your Sampling and Analysis Plan (SAP). The Pre-Filing Meeting Request form[2] is on the SFBRWQCB's website. If an applicant would like to engage with the SFBRWQCB prior to submitting the SAP, please send

1 https://www.waterboards.ca.gov/sanfranciscobay/certs.html

2 https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/dredging.html

an email to rb2-dredgereports@waterboards.ca.gov requesting that a project manager be assigned to the project. The project manager will follow up with the applicant.

- If the applicant is applying for a multi-episode 401 water quality certification without a first episode approval, please send an email to rb2-dredgereports@waterboards.ca.gov requesting that a project manager be assigned to the project. The project manager will follow up with the applicant and provide directions on how to submit the Pre-Filing Meeting Request form.

PERMITTING TIMELINE • Consistent with State regulations, SFBRWQCB staff will evaluate the application to determine if the application is complete and whether the information submitted is sufficient. SFBRWQCB staff will communicate promptly with the project proponent should the application be incomplete or there is insufficient information.

For additional information please see https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/dredging.html

Appendix B2 | SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION

BCDC Regulatory Authority in Reviewing Proposed Dredged Material Placement in Different Environments					
In-Bay	Ocean	Wetland enhancement[1]	Restoration of diked historic baylands	Upland placement[2]	Landfill
Permit, pursuant to McAteer-Petris Act (MPA) or Suisun Marsh Preservation Act (SMPA); or Letter of Agreement (LOA) on federal consistency determination (CD), pursuant to Coastal Zone Management Act (CZMA), for dredging and placement	Advisory	Permit, pursuant to MPA or SMPA, or LOA, pursuant to CZMA, for dredging, permit or LOA for placement site	Permit, pursuant to MPA or SMPA, or LOA, pursuant to CZMA, for dredging, permit or LOA for placement site	Advisory outside of shoreline band jurisdiction	Advisory

[1] Existing wetland enhancement

[2] Upland placement other than within BCDC Bay, Shoreline Band, Salt Pond, Managed Wetland jurisdictions

PERMITTING REQUIREMENTS/PROCESS SPECIFIC TO AGENCY • For maintenance dredging or new work dredging projects with no other project components, please fill out the DMMO application and provide supporting documents, and project plans. If the proposed project has additional components, such as wharf replacement or other non-dredging activities, please fill out the BCDC application form. Please submit the completed application electronically at info@bcdc.ca.gov and send the application fee via check to BCDC's offices.

PERMITTING TIMELINE • Consistent with BCDC regulations, once an application is received, a response letter will be issued within 30 calendar days stating if the information submitted is sufficient and the application is filed complete, or detailing the information needed to file the application complete. The applicant then has time to provide the information requested. Once the application is filed complete, the BCDC analyst will complete the permit and issue it within 90 days as required by law. BCDC has the ability to issue maintenance dredging permits of any volume for up to 10 years, and new work dredging of up to 200,000 cy administratively, but projects with significant environmental issues, or of high stakeholder interest are often scheduled for a public hearing and Commission vote. Permits for new work dredging of greater than 200,000 cy are subject to a Commission public hearing and vote.

For additional information please see bcdc.ca.gov/permits/

Appendix B3 | U.S. ARMY CORPS OF ENGINEERS

USACE Regulatory Authority in Reviewing Proposed Dredged Material Placement in Different Environments					
In-Bay	Ocean	Wetland enhancement[1]	Restoration of diked historic baylands	Upland placement[2]	Landfill
Department of the Army permit pursuant to CWA and Rivers and Harbors Act (1899)	Department of the Army permit pursuant to MPRSA for transport of dredged material	Department of the Army permit pursuant to CWA	Department of the Army permit pursuant to Rivers and Harbors Act (1899), and to CWA if placement site in waters of the U.S.	Advisory, Department of the Army permit pursuant to CWA for return flows to waters of the U.S.	Advisory

[1] Existing wetland enhancement

[2] Upland placement other than diked historic baylands, waters of the U.S.

PERMITTING REQUIREMENTS/PROCESS SPECIFIC TO AGENCY • The U.S. Army Corps of Engineers has permitting authority over activities affecting waters of the United States. Three federal statutes mandate Corps jurisdiction over navigable waterways and adjacent wetlands. The basic form of authorization used by Corps districts is the standard permit. Processing such permits involves evaluation of individual, project specific applications in what can be considered three steps: preapplication consultation (for major projects), project review, and decision-making. The decision to issue or deny a permit is based on the public interest review, NEPA analysis, and, where applicable, a Section 404(b)(1) guidelines analysis or an analysis of the ocean dumping criteria. Additionally, a Corps permit will be issued only after receipt of the 401 Water Quality Certification and Coastal Zone Management Act permit for each project.

PERMITTING TIMELINE • On average, individual permit decisions for maintenance dredging projects are made within three to four months from receipt of a complete application. However, an additional three to four months of processing time can result from processing new work dredging applications and completing necessary consultations with resource agencies. USACE recommends applicants submit their applications at least six to nine months before the date they wish to start their dredging project.

For additional information please see spn.usace.army.mil/Missions/Dredging-Work-Permits/

Appendix B4 | U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 9

USEPA Regulatory Authority in Reviewing Proposed Dredged Material Placement in Different Environments					
In-Bay	Ocean	Wetland enhancement[1]	Restoration of diked historic baylands	Upland placement[2]	Landfill
CWA permit oversight	Site designation and MPRSA authorization; determination of material suitability for placement	CWA permit oversight	CWA permit oversight if placement site in waters of the U.S.	Advisory, CWA permit oversight	Advisory

[1] Existing wetland enhancement

[2] Upland placement other than diked historic baylands, waters of the U.S.

PERMITTING REQUIREMENTS/PROCESS SPECIFIC TO AGENCY • USEPA has the lead responsibility for matters related to ocean placement and has permit oversight under the CWA for Section 404 actions. For ocean placement of dredging material, USEPA is responsible for ocean disposal site (ODS) designations and ongoing management and monitoring of those sites, MPRSA permits and authorizations, and determination of material suitability for proposed placement. USEPA also has enforcement authorities under the MPRSA for placement of dredged material in federal waters.

Under the LTMS and DMMO, USEPA provides both regulatory and advisory-capacity review in concert with the other agencies. In accordance with the LTMS program, the San Francisco Deep Ocean Disposal Site (SF-DODS) was formally designated in 1994 by USEPA.

PERMITTING TIMELINE • USEPA does not issue formal permits for dredging and placement; however, they must concur in writing for any ocean placement, and they have enforcement authority for any ocean placement violations. USEPA provides suitability determinations and concurrences for proposed dredged material placement at designated ODS, after first considering alternatives to ensure ocean placement is the only feasible option. Once USACE has collected all the necessary information and requested USEPA's concurrence, USEPA has 45-90 days to concur or non-concur (but generally provides a decision within 2 weeks). USEPA concurrence is predicated on full incorporation of mandatory ODS site-use conditions in the USACE dredging permit and in the DOP.

Appendix B5 | U.S. FISH AND WILDLIFE SERVICE & NOAA NATIONAL MARINE FISHERIES SERVICE

Potential Agency Actions for Dredging or Placement/Beneficial Reuse Projects					
In-Bay	Ocean	Wetland enhancement[1]	Restoration of diked historic baylands	Upland placement[2]	Landfill
Agreed to Minimization Measures through Programmatic Consultations and Biological Opinions	Advisory	Consult with USACE on project site	Consult with USACE on project site	Consult with USACE on project site	-

[1] Existing wetland enhancement

[2] Upland placement other than diked historic baylands, waters of the U.S.

PERMITTING REQUIREMENTS/PROCESS SPECIFIC TO AGENCY • Section 7 of the Endangered Species Act (1973) requires federal agencies (typically the USACE in San Francisco Bay) to consult with the U.S. Fish and Wildlife Service (USFWS) and/or NOAA National Marine Fisheries Service (NMFS) when authorizing a project that might affect a federally protected species, critical habitat and/or essential fish habitat (EFH) which is protected by NMFS under the Magnuson-Stevens Fishery Conservation Act (1976).

If the project is not already addressed by the USFWS and NMFS LTMS Programmatic Biological Opinions (as amended) for maintenance dredging, placement of dredged sediments, and beneficial reuse, the USACE works with the applicant and resource agency to determine whether or not the project will affect a listed species, critical habitat and/or EFH through an individual consultation. If it is determined that the project will not affect federally protected species or habitat, no further consultation is needed. If it is determined that the project may affect federally protected species or their critical habitat, the USACE and the applicant develop a biological assessment further defining the impact and proposing avoidance and minimization measures. Once complete, the USACE will request a formal consultation with the resource agency and provide the biological assessment. If it is determined that the project may adversely affect EFH, the USACE and the applicant develop an EFH assessment for NMFS and request EFH consultation.

When requesting consultation, the USACE makes one of the following determinations regarding the effects of the project:

- May Affect, But Not Likely to Adversely Affect (Informal Consultation)
- May Affect, Likely to Adversely Affect (Formal Consultation).

If the USFWS and NMFS agree with the USACE that the proposed project is not likely to adversely affect any listed species or designated critical habitat, USFWS/NMFS provide(s)

a letter of concurrence. If the project may adversely affect a listed species or designated critical habitat, the USFWS/NMFS prepare(s) a biological opinion. The intent of a biological opinion is to ensure that the project will not reduce the likelihood of survival and recovery of a listed species or cause destruction of critical habitat. A biological opinion usually includes terms and conditions, authorization for incidental take, and conservation measures. A biological opinion may determine that the effects of the project are such that they would jeopardize the continued existence or recovery of an ESA-listed species. Although rare, a dredging project with a jeopardy opinion is unlikely to be permitted by the regulatory agencies.

Similar to ESA consultations, an EFH consultation relies on the submittal of project information through an EFH Assessment. NMFS will review the information provided, seek necessary additional information, and then provide EFH recommendations to the federal consulting agency for consideration and potential inclusion in the project minimization and mitigation measures. In order to streamline the process, an EFH Assessement should be included in the same document as the Biological Assessment for ESA, and the EFH consultation response is included in ESA consultation response.

PROCESS TIMELINE •For both USFWS and NMFS a biological opinion must be completed within 135 days of initiating formal consultation. From the date that formal consultation is initiated, USFWS/NMFS are allowed 90 days to consult with the agency and applicant and 45 days to prepare and submit a biological opinion. If the consultation is conducted informally, USFWS/NMFS are allowed 60 days to respond.

If the federal consulting agency determines that the project will adversely affect EFH and provides an EFH assessment to NMFS, NMFS has 60 days to review the assessment and if necessary, provide EFH conservation recommendations. In turn the federal consulting agency and applicant will respond to NMFS within 30 days with information on how it will proceed with the project.

For additional information please see:

- https://www.spn.usace.army.mil/Portals/68/docs/Dredging/guidance/informal.pdf,
- https://www.fws.gov/endangered/what-we-do/faq.html,
- https://www.fisheries.noaa.gov/topic/consultations#endangered-species-act-consultations, and
- https://www.fisheries.noaa.gov/national/habitat-conservation/consultations-essential-fish-habitat

Appendix B6 | CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Potential Agency Actions for Dredging or Placement/Beneficial Reuse Projects					
In-Bay	Ocean	Wetland enhancement[2]	Restoration of diked historic baylands	Upland placement[3]	Landfill
Issue Lake and Streambed Alteration (LSA) Agreement pursuant to Fish and Game Code[1], Incidental Take Permit (ITP) pursuant to California Endangered Species Act (CESA)	Potential ITP	LSA Agreement, ITP	Potential LSA Agreement, ITP	Potential ITP	-

[1] Dredging within the Bay would not require an LSA – an LSA is only needed when dredging within rivers, creeks, and sometimes sloughs that are a tributary to the Bay

[2] Existing wetland enhancement

[3] Upland placement other than diked historic baylands, waters of the U.S.

PERMITTING REQUIREMENTS/PROCESS SPECIFIC TO AGENCY • California Department of Fish and Wildlife (CDFW) protects state-listed species in and around San Francisco Bay, its tributaries, the Delta and the outer coast. Should the proposed dredging take place in a tributary to the Bay, Fish and Game Code Section 1602 requires the project proponent to notify CDFW before beginning an activity that may substantially divert or obstruct the natural flow of, or substantially change or use any material from a tributary to the Bay. If CDFW determines that the proposed activity/dredging in a tributary to the Bay may substantially adversely affect fish and wildlife resources, a Lake and Streambed Alteration (LSA) Agreement will be prepared. An Incidental Take Permit (ITP) is required when a project, such as suction or hydraulic dredging in the Bay or a tributary to the Bay, has the potential to take a state listed species and thus requires mitigation for the potential loss.

PERMITTING TIMELINE • Lake and Streambed Alteration Agreements and Incidental Take Permits can be issued for multiple years and can be amended should the project change over time including an extension of time for the agreement. Per CDFW law, after receipt of a complete LSA Agreement application or ITP application, a finalized decision will generally be issued within 120 days.

For additional information please see:

- https://wildlife.ca.gov/Conservation/LSA,
- https://wildlife.ca.gov/Conservation/CESA/Permitting/Incidental-Take-Permits, and
- https://epims.wildlife.ca.gov/index.do

Appendix B7 | CALIFORNIA STATE LANDS COMMISSION

CSLC Regulatory Authority in Reviewing Proposed Dredged Material Placement in Different Envionments					
In-Bay	Ocean	Wetland enhancement[1]	Restoration of diked historic baylands	Upland placement[2]	Landfill
Lease if placement on state lands other than state and federally authorized disposal sites	Advisory	Lease if placement on state lands	Lease if placement on state lands	Lease if placement on state lands	Lease if placement on state lands

[1] Existing wetland enhancement

[2] Upland placement other than diked historic baylands, waters of the U.S.

PERMITTING REQUIREMENTS/PROCESS SPECIFIC TO AGENCY • The California State Lands Commission requires a lease application and issues leases for dredging projects that are in SLC's jurisdiction and outside of "Granted lands". Granted lands are areas of the bay that have been granted to Cities (Berkeley, SF, Oakland, Richmond, Benicia, etc.) in the past. Legislation that took effect January 1, 2014, eliminated the requirement of a lease from CSLC for dredging on granted lands. If dredging occurs outside of granted lands, a lease is still required. When dredging lease applications are being reviewed, staff reviews the project description, sample analysis reports, and DMMO agency permits and approvals.

PERMITTING TIMELINE • Dredging leases are generally issued for 10 years and applicants submit the consolidated dredging application or apply online on our website before the expiration date of the lease. If the project is on granted lands SLC sends out a letter informing the applicant that a lease is not or no longer required. However, there is a checklist of information the applicant needs to provide; this includes maps, description, dredge amounts and methods, placement location and all permits.

During the lease term, lessees are required to submit reports of dredging volumes and placement. Most of the on-going dredging projects in the Bay are either on granted lands and do not require a lease from CSLC or are currently under lease.

For additional information please see https://slc.ca.gov/wp-content/uploads/2018/10/Short_Form_App.pdf and https://www.slc.ca.gov/leases-permits/.

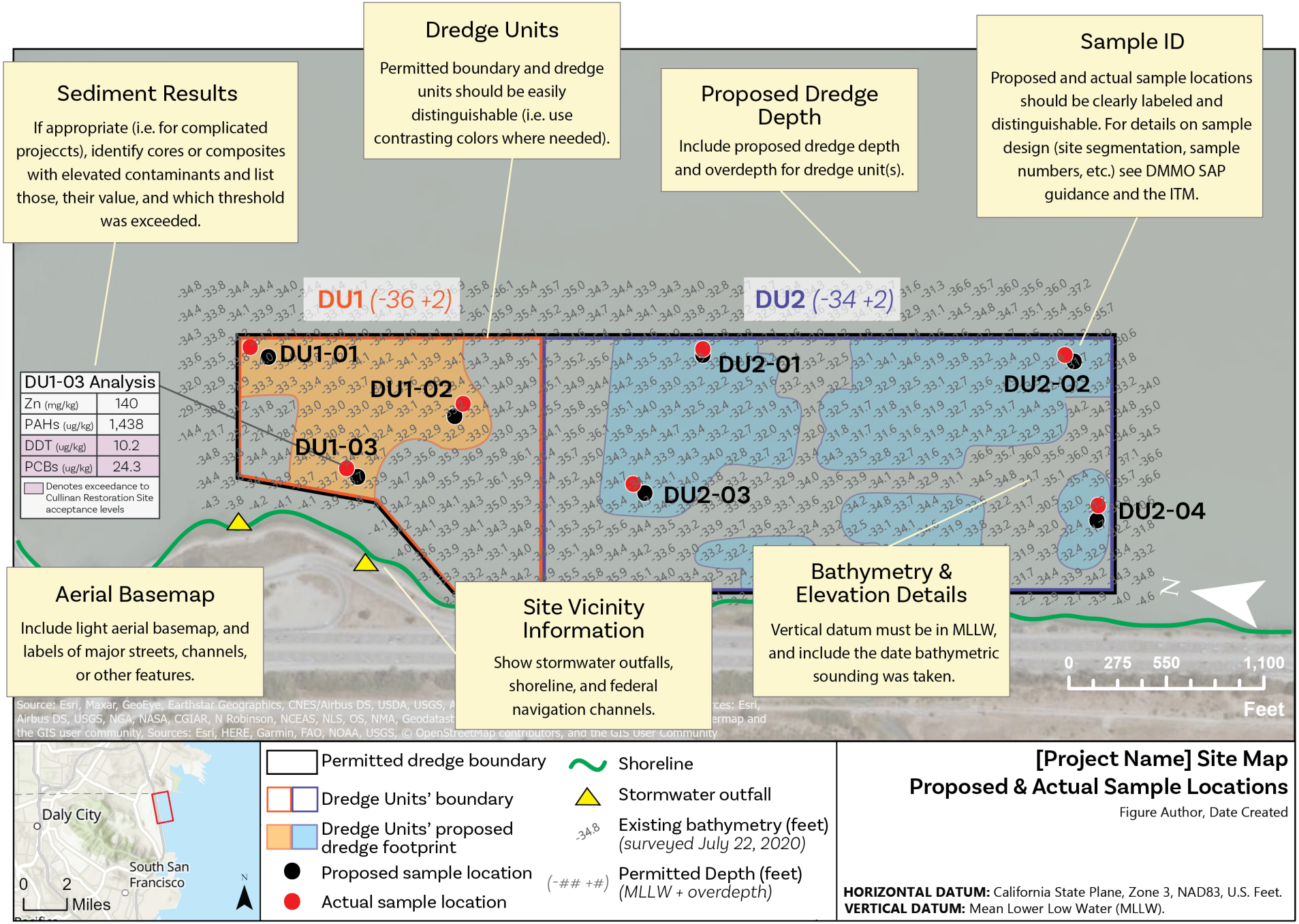
Maintenance Dredging Work Windows by Area and Species

Site	Species	Jan 1-15	Jan 16-31	Feb 1-15	Feb 16-28	Mar 1-15	Mar 16-31	Apr 1-15	Apr 16-30	May 1-15	May 16-31	Jun 1-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-30	Dec 1-15	Dec 16-31
SF Bay Bridge to Sherman Island	Chinook Salmon and Steelhead	Consultation Required										Work Window													
Carquinez Bridge to Collinsville	Delta Smelt Water ≤10' *	Consultation Required																							
	Delta Smelt Water >10' *	Consultation Required														Work Window									
Napa and Petaluma Rivers, Sonoma Creek	Steelhead	Consultation Required														Work Window				Consultation Required					
Napa River	Delta Smelt	Work Window		Consultation Required												Work Window									
All areas within 45 meters of eelgrass habitat	Dungeness Crab	Work Window								Consultation Required				Work Window											
San Francisco Bay from Pinole Point to Redwood Creek	Pacific Herring	Consultation Required					Work Window																	Consultation Required	
Richardson Bay & San Francisco Waterfront (Hard stop at November 30th)	Pacific Herring	Consultation Required					Work Window																	Consultation Required	
Waters of Marin County from the Golden Gate Bridge to Richmond-San Rafael Bridge	Coho Salmon	Consultation Required										Work Window										Consultation Required			
Berkeley Marina to San Lorenzo Creek within 1 mile of coastline	California Least Tern	Work Window					Consultation Required									Work Window									
South of Highway 92 Bridge (San Mateo-Hayward)	California Least Tern	Work Window										Consultation Required						Work Window							
In areas with eelgrass beds	California Least Tern	Consultation Required																							
Baywide in areas of salt marsh habitat	California Clapper Rail	Consultation Required																							
Baywide within 250 feet of salt marsh habitat	California Clapper Rail	Work Window		Consultation Required														Work Window							
In and adjacent to salt marsh habitat	Salt Marsh Harvest Mouse	Consultation Required																							
Within 300 feet of known roost site	California Brown Pelican	Work Window												Consultation Required						Work Window					

For more detailed information, see Appendix F of the LTMS Management Plan or the LTMS EIR/EIS.
* Depths are represented in MLLW, and are project depth, not including over dredge allowance
**This chart is for operations and maintenance dredging of existing navigational facilities. Other species may be affected by work in other areas.

WORK WINDOW

CONSULTATION REQUIRED



The graphic shown represents some figure elements that help the LTMS agencies review SARs more effectively, not all items listed are required and depending on site conditions, some may not apply, however adding these elements may help avoid questions and revisions. This graphic does not represent a real project and is intended as a reference only.

Glossary

ADVANCED MAINTENANCE DREDGING • dredging to a specific depth and/or width beyond the normal maintenance dimensions in critical and fast-shoaling areas to avoid frequent re-dredging. Requires authorization

BATHYMETRY • the measurement of depth of water

BENEFICIAL REUSE • the utilization of dredged sediment as a resource for another purpose, examples include wetland restoration, levee maintenance, and construction materials, etc.

BIOACCUMULATION • the uptake of contaminants into an organism through any route including respiration, ingestion, or direct contact

BIOASSAY • the use of living organisms to determine the effect of a substance, factor, or condition

COVER SEDIMENT • the upper layer of sediment that is placed on top of contaminated sediment and does not require isolation from the biotic zone, often minimally 3 feet.

DMMO AGENCIES • the collective term for the member agencies of the DMMO, including BCDC, SFBRWQCB, USACE, and USEPA, who conduct coordinated review of dredging projects in the San Francisco Bay region

DREDGE • (verb) removal of sediment deposits from a seabed, flood control channel, or other area of water.

DREDGE • (noun) an apparatus for bringing up sediment (such as mud or sand) or objects from a seabed by scooping, suction, or other means

DREDGE FOOTPRINT • the outermost boundary that delineates the area to be dredged

DREDGE UNIT • a defined portion of the area to be dredged for the purposes of sediment chemistry sampling and analysis or dredging activities

EPISODE • the duration of a dredging activity that is required to complete a specified dredging project

FOUNDATION SEDIMENT • sediment with elevated levels of contaminants such that it is not suitable for in-bay disposal, it is placed in specifically authorized areas with institutional controls and isolated from water bodies to prevent contaminants from entering the water column or wetlands increasing exposure to wildlife or plants

FULLY-PROTECTED SPECIES • those animals that are rare or face possible extinction identified by the California Department of Fish and Wildlife in the 1960's, prior to the authorization of the California Endangered Species Act. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take,

with the exception of authorized specific scientific research or relocation

HYDRAULIC DREDGING • the use of suction equipment, often while injecting with additional water for the purpose of dredging

IN-BAY DISPOSAL • the placement of dredged sediment at one of four state and federally authorized aquatic placement sites within San Francisco Bay

INLAND TESTING MANUAL • a guidance document published jointly by the USEPA and USACE in 1998 for the evaluation of dredged sediment proposed for disposal in waters of the U.S. under section 404 of the Clean Water Act

KNOCKDOWN • relocating sediment from higher locations (mounds or shoals) to deeper locations within the dredging project area by plowing, leveling, or contouring

LISTED SPECIES • organisms that meet the definitions of endangered or threatened under the Federal Endangered Species Act or California Endangered Species Act

LTMS AGENCIES • the collective term for the member agencies of BCDC, SFBRWQCB, CSLC, USEPA, and USACE – the signatories to the LTMS Program's Management Plan of 2001

MAINTENANCE DREDGING • dredging in a berth, marina, or channel that was previously dredged to the same depth and width. Relatively soft, unconsolidated, accumulated sediment is typically removed from regularly dredged areas

MEAN LOWER LOW WATER • (MLLW) the average height over a 19-year tidal epoch (National Tidal Datum Epoch) of the lower of the two daily low tides

NAVIGATION DREDGING • the removal of sediment from the Bay floor or tributaries in order to ensure safe passage of boats and ships

NEW WORK DREDGING • Dredging an area that has never been dredged, or areas that are being deepened or widened. In the past, the agencies have used a 20-year period of no dredge activity as a threshold after which a project may be considered new work. Sediment to be dredged is often low-moisture, deep and/or consolidated material, including historic marine or riverine sediment

NUAD • a term used for sediment that is deemed not suitable for unconfined aquatic disposal and cannot be placed in San Francisco Bay

OCEAN DISPOSAL • placement of dredged sediment in a state and/or federally authorized, open ocean waters generally lying seaward of three nautical miles from the shoreline regulated by the USEPA and USACE under MPRSA

OCEAN TESTING MANUAL • a national guidance document published jointly by the USEPA and USACE in 1991 for the sampling, testing, and analysis of water, sediment, and tissue to evaluate the environmental acceptability of dredged material proposed for ocean disposal (also known as the Green Book)

OVER-DEPTH DREDGE ALLOWANCE • an allocation for the reality of dredging activity that allows for the inaccuracies in the dredging process, generally 1 – 2 feet below the project design depth

RESOURCE AGENCIES • a collective term for CDFW, USFWS, and NOAA NMFS, who are consulted with on an as-needed basis regarding potential impacts to special status species or habitat that may result from dredging and sediment placement projects

SEDIMENT • particles of inorganic and organic material of various sizes that have been transported by air, water, or ice and have accumulated in water in loose form behind dams, in bays, in streams, on beaches, in marine canyons, and in other areas. Examples of sediment are gravel, sand, silt, clay/mud

SPECIAL STATUS SPECIES/SPECIES OF SPECIAL CONCERN • fish and wildlife that are facing one or more threats to their population and/or habitat with small or declining populations, are at risk and/or are of management concern, or are commercially managed due to their economic importance

SUAD • a term used for sediment that is deemed suitable for unconfined aquatic disposal and can be placed in San Francisco Bay at an appropriate placement location.

SUBMERGED AQUATIC VEGETATION • (SAV) vascular plants (not seaweeds or algae) that live entirely underwater

TIERED TESTING APPROACH • a structured, hierarchical procedure for determining sediment chemistry and bioassay data needs to obtain sufficient information to determine the sediment's suitability or unsuitability for each of the various disposal sites

WEIGHT-OF-EVIDENCE APPROACH • a method for decision-making that involves consideration of multiple sources of information and lines of evidence

Z-LAYER • the material that comprises the newly exposed sediment surface once dredging is completed, generally 6 inches below the over dredge depth allowance

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