



LONG TERM MANAGEMENT STRATEGY

Dredged Material Management Office (DMMO) Dredging and Placement of Dredged Material in San Francisco Bay January-December 2014 Report



September 2015

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**Dredged Material Management Office
Dredging and Placement of Dredged Material in San Francisco Bay
January-December 2014 Report**

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I. INTRODUCTION

Dredged Material Management Office

Since 1996 the Dredged Material Management Office (DMMO) has been promoting economically and environmentally sound dredging and the placement of dredged sediment in the San Francisco Bay region. Founded through the Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) program, the DMMO is a joint program comprised of the following member agencies: U.S. Army Corps of Engineers, San Francisco District (USACE); the U.S. Environmental Protection Agency, Region IX (EPA); the San Francisco Bay Regional Water Quality Control Board (Water Board); the San Francisco Bay Conservation and Development Commission (BCDC) and the California State Lands Commission (SLC). The California Department of Fish and Wildlife (CDFW) (formerly California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), and the National Marine Fisheries Service (NMFS) participate in the DMMO and the Project Coordination Meetings (see Section III) as commenting resources agencies.

The goal of this interagency group is to increase efficiency and consistency in the permitting process and to foster a comprehensive and consolidated approach to handling dredged sediment management issues. Together, the DMMO agencies facilitate processing of dredging permit applications within existing laws, regulations and policies and provide the mechanism to allow the involvement and participation of permit applicants and interested parties during the application process. The DMMO reviews projects within the geographic area that includes all of San Francisco Bay Estuary up to Sherman Island, the Bay's major tributaries to the point where navigation is no longer feasible, upland areas surrounding the estuary

DMMO Responsibilities

- **Receive and coordinate permit application review for dredging projects proposed in the San Francisco Bay area.**
- **Develop guidance documents as needed.**
- **Review and approve sediment quality sampling and analysis plans.**
- **Analyze the results of sediment quality tests.**
- **Make suitability determinations for placement at in-Bay, ocean and beneficial reuse sites.**
- **Coordinate programmatic requirements such as species consultations, alternative disposal site analyses and record-keeping.**

and the San Francisco Deep Ocean Disposal Site (SF-DODS) designated by the EPA.

DMMO generally meets twice a month and the meetings are open to the public. The USACE posts the meeting schedules and agendas on the USACE DMMO website ([www.spn.usace.army.mil/Missions/DredgingWorkPermits/DredgedMaterialManagementOffice\(DMMO\).aspx](http://www.spn.usace.army.mil/Missions/DredgingWorkPermits/DredgedMaterialManagementOffice(DMMO).aspx)) and sends electronic copies of the agendas to interested parties and pertinent resources agencies. The dredging project data compiled and analyzed by the DMMO, including environmental work windows adherence and placement volume targets set forth in the LTMS Management Plan, are provided in the DMMO annual reports which can also be found, along with guidance documents and other DMMO background information, on the USACE DMMO website.

Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS)

The LTMS was formed in 1990 by the BCDC, USACE, EPA, the Water Board, and SLC, in response to concerns regarding potential direct and cumulative impacts from dredging and dredged sediment disposal to water quality, wildlife and uses of the San Francisco Bay. The agencies developed and certified a programmatic EIS/EIR that evaluated a range of alternatives for integrated management of dredging and dredged sediment placement (LTMS, 1998). The selected, environmentally preferred alternative from the programmatic EIS/EIS called for the long term goals of at least 40% of dredged sediment going to beneficial reuse, no more than 20% being disposed in the Bay, and the remainder being disposed at the San Francisco Deep Ocean Disposal Site (SF-DODS). This alternative was further developed and implemented via the LTMS Management Plan (LTMS, 2001). As part of the LTMS Management Plan, the DMMO coordinates dredging and dredged sediment disposal and placement.

Of particular importance was the Management Plan's 12-year transition period, designed to gradually reduce the in-Bay disposal volume limit to the long term target of a maximum of 1.25 million cubic yards (cy) per year by the end of 2012. The purpose of the transition period was to provide time for dredging project sponsors to plan ahead for the logistic and economic changes of the new methods of dredged sediment management and for additional beneficial reuse sites to be developed. The 12-year period began with an immediate reduction of the allowed in-Bay disposal volume by over 50%, to 2.8 million cy for the first three years. A further reduction of 378,500 cy occurred every three years thereafter, until the long term in-Bay volume limit was reached starting in 2013 (Figure 1).

At the end of the transition period the LTMS agencies conducted a review of the overall program and found, as shown in Figure 2 below, in-Bay disposal remained below the annual transition period limits each year, except 2011. However, for each three-year period the annual volumes are averaged, and the average volumes always remained below the transition period limits. Therefore, individual project allocations (as provided for in the Management Plan) were never triggered. The LTMS Twelve Year Review as well as the DMMO annual reports, which contain detailed year-by-year history of dredging volumes and placement locations are available on the DMMO web site.

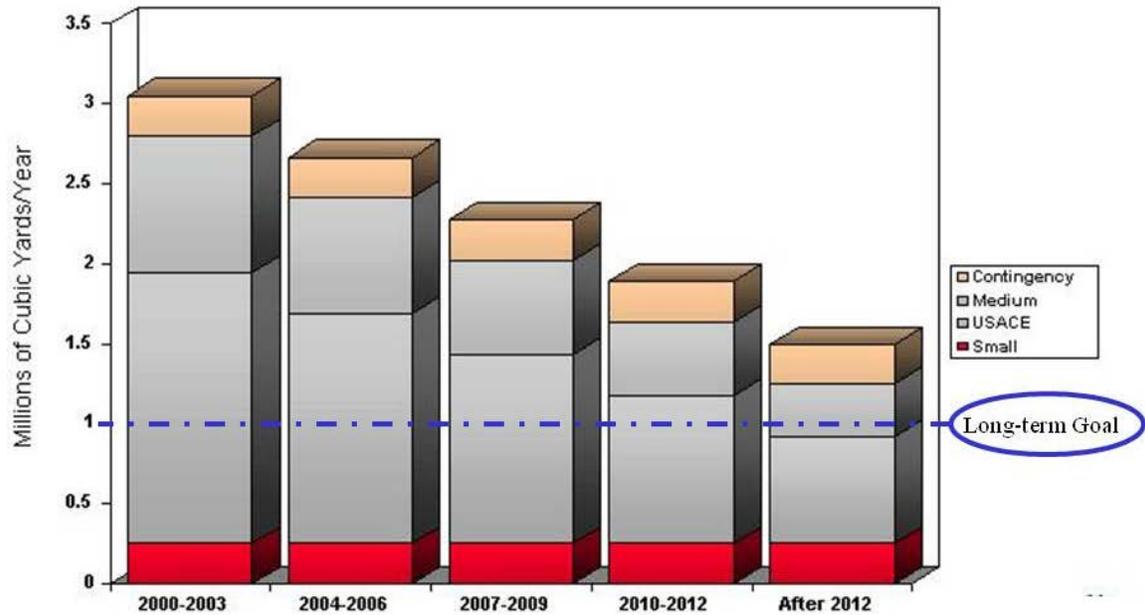


Figure 1. The LTMS Transition Period, showing the annual in-Bay disposal volume limit decrease every three years by 387,500 cy.

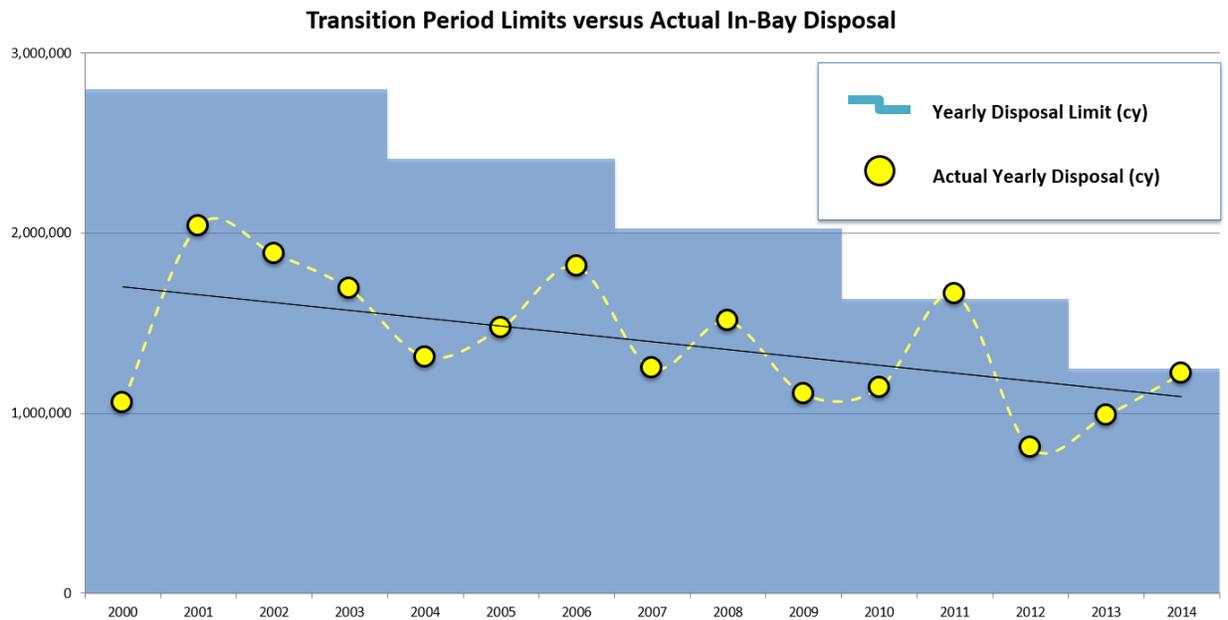


Figure 2. Actual in-Bay disposal volumes for 2000-2014, compared to the transition period limits (2000-2012) and the final post-transition period disposal limit (2013-2014).

II. 2014 DREDGING AND PLACEMENT OVERVIEW

In 2014, 27 projects dredged a total of 2.1 million cy of sediment from San Francisco Bay. Approximately 1.2 million cy of this sediment (57.4% of the total volume dredged) was disposed in-Bay at the four designated in-Bay dredged material disposal sites (SF-9, SF-10, SF-11, and SF-16); 0.77 million cy (36.5%) was beneficially reused; and 0.13 million cy (6.1%) was disposed at SF-DODS (See Appendices 1 and 2). In comparison, 20 projects dredged a total of 3.2 million cy of sediment from the Bay in 2013.

While the LTMS's in-Bay disposal volume limit of 1.25 million cy per year was not exceeded, the LTMS' in-Bay disposal percentage goal (20%) was exceeded. Although the in-Bay disposal volume was only slightly higher in 2014 than it was in 2013, the percentage of total volume disposed in-Bay jumped from 31% in 2013 to 57.4% in 2014. The higher in-Bay disposal percentage in 2014 is largely due to the much reduced total dredged sediment volume, which also accounts for most of the increase in beneficial reuse (36.5% in 2014 vs. 17% in 2013), but not the dramatic decrease in ocean disposal (6.1% in 2014 vs. 52% in 2013). The volume of dredged sediment taken to SF-DODS decreased by about a factor of 12 (0.13 million cy in 2014 vs. 1.63 million cy in 2013).

Of the sediment disposed at in-Bay dredged material disposal sites, 55.4% went to the Alcatraz Island Disposal Site (SF-11), 27.5% went to the San Pablo Bay Disposal Site (SF-10), 10.7% went to the Suisun Bay Disposal Site (SF-16), and 6.4% went to the Carquinez Strait Disposal Site (SF-9). The volumes of sediment and disposal locations are shown in Figure 3 and in Appendix 2.

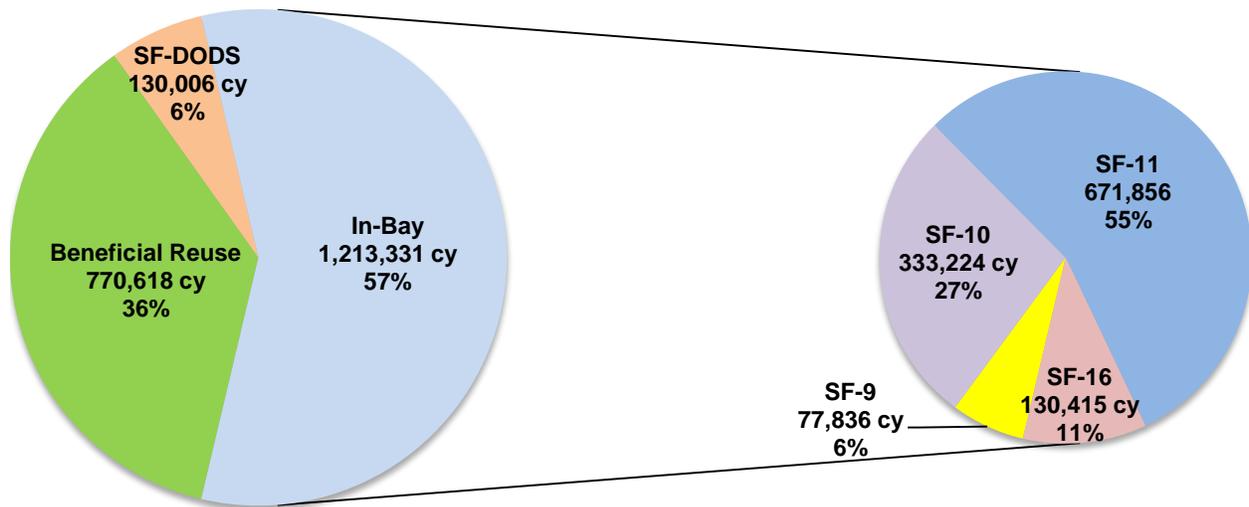


Figure 3. 2014 Total Dredge Material Placement, highlighting In-Bay Disposal Site Volumes

Beneficial Reuse and Upland Placement

In 2014, approximately 770,618 cy of dredged sediment (36.5% of the total 2.1 million cy dredged) was beneficially reused or taken to upland placement sites. In all, six San Francisco Bay beneficial reuse sites were available to dredging project sponsors (see Table 1). These sites range from large engineered sites to small upland placement sites. It is important to note that these sites have varying equipment, logistical, and sediment characteristic requirements.

Table 1. 2014 Dredge Sediment Taken to Beneficial Reuse Sites

Placement Location	Sediment Placed (cy)	% of Total Reuse/Upland
Montezuma Wetlands Restoration Project	647,345	84%
Cullinan Ranch Restoration Project	60,965	7.9%
Winter Island	29,054	3.8%
San Rafael Rock Quarry	11,426	1.5%
Napa Valley Marina Upland Site	16,200	2.1%
SF-8 Bar Channel Site Eastern Portion	5,628	0.7%
Total	770,618	100%

The following beneficial reuse sites received dredged sediment in 2014:

- Montezuma Wetland Restoration Project (MWRP)

As shown in Table 1, the majority (84%) of the sediment was taken to the Montezuma Wetlands Restoration Project. Approximately 647,345 cy of dredged sediment was placed at the MWRP in 2014 from eight maintenance dredging projects, of which 341,808 cy came from USACE dredging of the Oakland Harbor federal channel, and 106,079 cy came from dredging at the Chevron Richmond Long Wharf. The remaining volume came from dredging projects at BAE Systems – San Francisco Dry Dock (63,889 cy), Port of Oakland Berth Maintenance (69,157 cy), USACE Richmond Inner Harbor (34,100 cy), Phillips 66 Richmond Terminal (18,695 cy), and the Amports Benicia Port Terminal (13,617 cy).

- Cullinan Ranch Restoration Project

Mare Island Dry Dock maintenance dredging project placed 60,965 cy of dredged sediment at Cullinan Ranch Restoration Project site in the San Pablo Bay National Wildlife Refuge. In 2014, USACE, BCDC, and the Water Board had revised their permits for tidal marsh habitat restoration to increase the volume of dredged sediment authorized for placement from 450,000 cy over 50 acres to 2.8 million cy over 290 acres of the 1,575-acre site.

- Winter Island Levee Placement

Valero Refinery Terminal and Tesoro Avon Refinery Terminal placed 26,582 and 2,472 cy of dredged sediment, respectively, at Winter Island to raise and reinforce the perimeter levee protecting managed waterfowl habitat. This site is located at the confluence of the Sacramento and San Joaquin Rivers.

- SF-8 Bar Channel Site, Eastern Portion (sand only)

Phillips 66 Rodeo Refinery Terminal maintenance dredging project placed 5,628 cy of dredged sediment within the eastern portion of SF-8. This site is considered beneficial reuse because the sand placed there nourishes the littoral cell.

- Upland Placement or Landfill Disposal

Napa Valley Marina placed 16,200 cy of fine-grain sediment at an adjacent upland site for agricultural use and 11,426 cy of sand dredged from the San Francisco Marina West Harbor's sand trap was placed at the San Rafael Rock Quarry.

Suitable for Unconfined Aquatic Disposal (SUAD) vs. Not Suitable for Unconfined Aquatic Disposal (NUAD)

The DMMO reviewed and approved four projects that had NUAD sediment for in-Bay disposal: BAE Systems San Francisco Ship Repair Facility; Phillips 66 Richmond Terminal; Port of San Francisco Berth 27; and Port of San Francisco Berth 35 East. This NUAD sediment represents approximately 3.8% of all dredged sediment (80,684 cy of 2.1 million cy), as shown in Table 2. Of this total volume, 45,624 cy was approved for placement as foundation sediment at MWRP and 35,060 cy at SF-DODS.

Table 2. Dredge Volume NUAD for In-Bay Placement Sites

Project	NUAD for In-Bay (cy)	Placement Site
BAE Systems (Dry Dock 2-DU2 & Central Basin)	26,929	MWRP (Foundation)
Phillips 66 Richmond Terminal	18,695	MWRP (Foundation)
Port of San Francisco Berth 27 (DU2B)	12,976	SF-DODS
Port of San Francisco Berth 35 East	22,084	SF-DODS
Total	80,684	

Dredging Equipment Type

The majority of the dredging in 2014 was performed with clamshell dredges, including the largest of the USACE projects in the Oakland Harbor, and Redwood City Harbor channels. A hydraulic hopper dredge was used on the USACE projects in the Pinole Shoal Channel, Richmond Outer Harbor Channel, and in Suisun Bay Channel/New York Slough/Bulls Head Reach. Mitigation for impacts to threatened or endangered species (longfin and Delta smelt) was required for the projects using a hydraulic dredge. The mitigation requirements were satisfied through the purchase of mitigation credits at Liberty Island Mitigation Bank.

Environmental Work Windows

The LTMS Management Plan set forth the initial environmental work windows for dredging activity in San Francisco Bay (Appendix F in LTMS 2001). The work windows are the result of terms and conditions of the LTMS Programmatic Biological Opinions (BOs) issued by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) and concurrence from CDFW.¹ The environmental work windows encourage projects to work when sensitive species are not present (which depending on location may be June 1-November 30, August 1-November 30, or August 1-October 15). Of the 27 dredging projects completed in 2014 (not including the Main Ship Channel), most began in or after the month of August, and 17 of them were completed entirely within their work windows. Ten projects were dredged at least partially outside the work windows.

Mare Island Dry Dock was allowed, through consultations with NMFS, USFWS, and CDFW, to start dredging in July, a month before the work window opens in the Napa River. Several other non-USACE projects (Benicia Marina, Paradise Cay Homeowners, Vallejo Marina, Vallejo Yacht Club, and Strawberry Channel) requested and received extensions to perform dredging that could not be completed by the close of the work windows (October 15 for the two Vallejo projects; and November 30 for the remaining projects). The USACE projects that dredged outside the work windows were the Oakland Inner and Outer Harbor, Redwood City Harbor, Richmond Outer Harbor, and Richmond Inner Harbor channels. Figure 4 shows the volume and percentage breakdown of the dredging work performed in relation to the environmental work windows.

¹ Note that in 2014 the LTMS agencies continued to coordinate closely with NMFS to update their BO for the LTMS Program. That update was completed in 2015, resulting in important changes to some of the earlier environmental work windows.

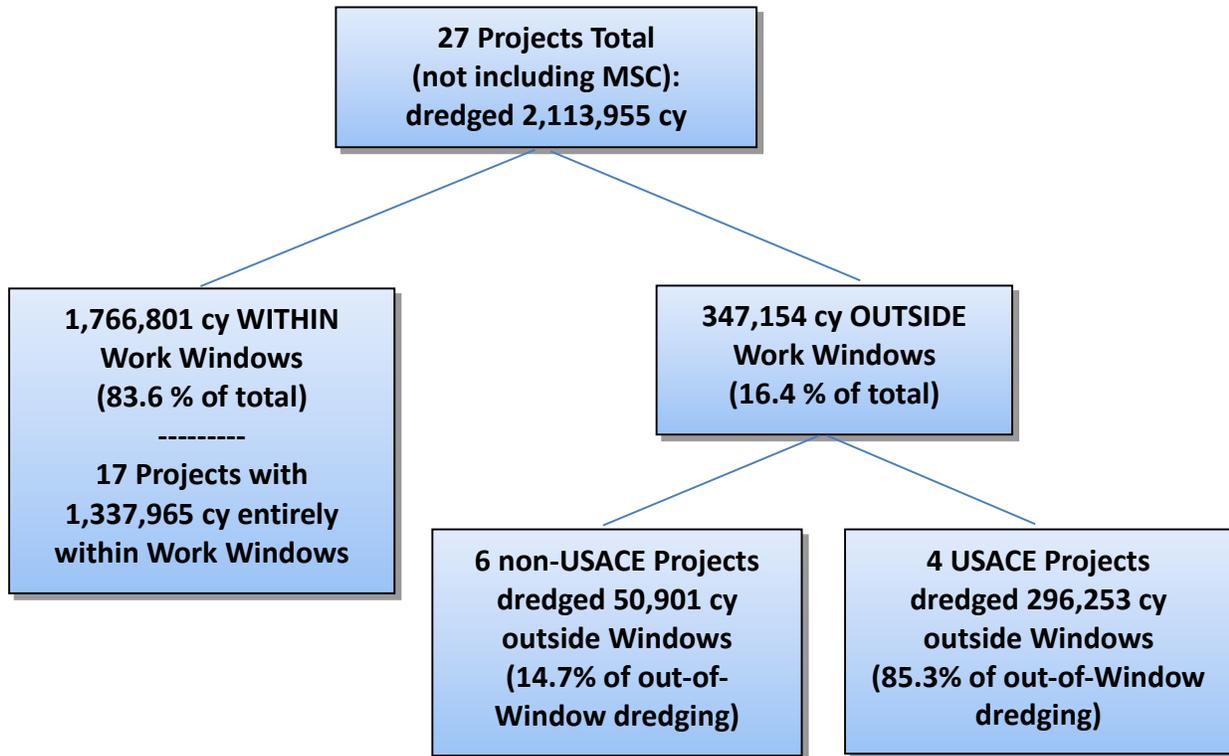


Figure 4. Projects and Dredge Volumes Relative to Work Windows

LTMS Programmatic Biological Opinion

As mentioned in the previous section, in order to minimize disturbance to endangered and special status species, all dredged sediment disposal activities shall be confined to the work window, generally between June 1 and November 30 of any year. This work window is established by Tables F-1 and F-2 of Appendix F, “In-Bay Disposal and Dredging”, and Figures 3.2 and 3.3 of the LTMS Management Plan (2001), as amended by USFWS on May 28, 2004. No work inconsistent with the time and location limits contained in these tables may be conducted without a consultation between and approval from the USACE and the USFWS and/or NMFS; as well as obtaining BCDC approval.

All but three dredging projects utilized the NMFS and USFWS LTMS programmatic BOs and CDFW’s concurrence. Mare Island Dry Dock completed individual consultations with the three resource agencies to allow dredging a month before the opening of the work windows for two listed fish species in Mare Island Strait. The Port of Redwood City’s F-Dock dredging was considered “new work” due to lack of maintenance dredging in the past 20 years and therefore was required to and obtained an individual consultation from NMFS. USACE dredging in the Richmond Inner Harbor federal channel occurred in December 2014, after the close of the salmonid and Pacific herring work windows on November 30, and without a consultation with NMFS. USACE did, however, adhere to CDFW’s Pacific herring work window waiver, impact minimization requirements.

Essential Fish Habitat (EFH) Compliance (Appendices 3 and 4)

In June of 2011, the USACE and EPA issued the final agreement with NMFS entitled, “*Agreement on Programmatic EFH Conservation Measures for Maintenance Dredging Conducted Under the LTMS Program (Tracking Number 2009/06769)*”. The LTMS agencies have programmatically implemented this EFH agreement, including its provisions related to residual contaminants, bioaccumulation testing, as well as minimizing potential adverse effects to eelgrass and other submerged aquatic vegetation. Appendix 3 presents the EFH agreement compliance for all dredge projects not funded and maintained by USACE. Appendix 4 presents the EFH agreement compliance for all USACE funded and maintained dredge projects (the commercial navigation channels).

Of the projects that were dredged, Phillips 66 Richmond Terminal, had a potential bioaccumulation issue within its berth due to elevated DDT concentrations in the sediment likely/potentially exposed after dredging. This exposure is represented by the “z-layer” samples. Examination of the invertebrate bioaccumulation test results for the z-layer indicated that relevant toxicity thresholds would not be exceeded even if fish foraged exclusively in this area. The likely source of the DDT is the United Heckathorn Superfund site located upstream of this project in the Richmond Inner Harbor.

In regards to eelgrass, dredging projects within 250 meters or less of an eelgrass beds are required to employ suspended sediment minimization measures. Paradise Cay Homeowners marina is located adjacent to a small eelgrass bed and therefore used a silt curtain to minimize turbidity. The USACE had two projects, Richmond Inner Harbor and Oakland Harbor, with eelgrass within 250 meters. The USACE dredging projects did not deploy silt curtains, but completed pre-dredging and post-dredge eelgrass surveys and the comparison of the two by Merkel and Associates, Inc., found that there were no observable adverse effects to eelgrass from these two projects.

III. RELATED ISSUES

DMMO Project and Sediment Quality Database

LTMS funds were used to develop a web-based data management system to store, retrieve, query and update sediment quality data and information in support of the DMMO. The DMMO’s San Francisco Bay dredging and disposal database is now available online (www.dmмосfbay.org). The database contains sediment testing data from years 1990 to 2010 and is accessible for browsing and query of permit history, suitability summaries, historical sediment chemistry testing data, historical bioassay testing data and other specific documents. The database has been designed to allow dredging project sponsors, labs, and consultants to upload their project data into the system and to review the projects’ sediment quality history. Laboratory test results submittal is currently being beta-tested.

SediMatch

In order to improve sediment placement planning and scheduling, DMMO and LTMS partner, San Francisco Bay Joint Venture, are developing a sediment placement site database to improve and increase the matching of dredging projects with appropriate beneficial reuse sites. A pilot meeting was held at BCDC in 2013 to bring interested parties together to coordinate sediment supply and demand, discuss placement options and logistics as well as potential cost-sharing opportunities. Additional work has been completed towards creating links between dredging projects and restoration projects. The San Francisco Bay Joint Venture is working with the San Francisco Estuary Institute to host a web query tool to match sediment needs with projects that have sediment available. The DMMO database will likely be linked to this effort. The DMMO continues to collaborate with this project in order to match dredging projects with appropriate beneficial reuse sites.

IV. LOOKING AHEAD

For the 2015 dredge season, the DMMO will continue to implement the LTMS 1.25 million cy annual in-Bay disposal volume limit, and to encourage the development and use of beneficial reuse sites. At the close of the 2015 dredging season, the LTMS agencies will complete a review of the 2013 through 2015 averaging period to determine if the program has met the LTMS goals. Dredging project sponsors, labs and consultants will submit dredging documents (and test results as soon as this feature is functional) directly into the on-line database, rendering them immediately accessible to the DMMO and the public, thus increasing efficiency. Additionally, USACE continues to update the DMMO webpage with new information to provide better access to, and increase awareness of, the DMMO.

On July 9, 2015, NMFS issued the updated LTMS Programmatic Biological Opinion for salmon, steelhead, and green sturgeon, which is [available online here](#) (full link below). This update addresses new NMFS listed species, modifies some environmental work windows, and for the first time allows some projects to plan to work outside the established windows provided that the dredged sediment is placed at a beneficial reuse site benefitting fish habitat. It further provides the LTMS agencies the ability to authorize minimal dredging outside the window when unforeseeable circumstances delay project completion without further consultation with NMFS. This will expedite approvals and reduce workload.

Also in 2015, USACE and the Water Board released for public comment and subsequent certification of an EA/EIR evaluating USACE's maintenance of all the federal navigation channels in the Bay over a 10-year period. The EA/EIR pays particular attention to potential impacts of hydraulic dredging. The DMMO will assist in implementing any resulting program changes.

V. CONTACTS AND LINKS

DMMO MEMBER AGENCY STAFF CONTACTS:

USACE	Robert Lawrence	(415) 503-6808	Robert.J.Lawrence@usace.army.mil
BCDC	Brenda Goeden	(415) 352-3623	brenda.goeden@bcdc.ca.gov
RWQCB	Beth Christian	(510) 622-2335	EChristian@waterboards.ca.gov
EPA	Brian Ross	(415) 972-3475	ross.brian@epa.gov
SLC	Al Franzoia	(916) 574-0992	al.franzoia@slc.ca.gov

RESOURCE AGENCY CONTACTS:

CDFW	Arn Aarreberg (Bay Region)	(707) 576-2889	arn.aarreberg@wildlife.ca.gov
	Craig Weightman (Tributaries)	(707) 944-5500	craig.weightman@wildlife.ca.gov
	Jim Starr (Delta region)	(707) 944-5500	jim.starr@wildlife.ca.gov
USFWS	Ryan Olah (Bay region)	(916) 414-6625	Ryan_Olah@fws.gov
	Kim Squires (Delta region)	(916) 930-5634	Kim_Squires@fws.gov
NMFS	Sara Azat	(707) 575-6067	Sara.Azat@noaa.gov

USEFUL LINKS

DMMO WEBSITE:

[www.spn.usace.army.mil/Missions/DredgingWorkPermits/DredgedMaterialManagementOffice\(DMMO\).aspx](http://www.spn.usace.army.mil/Missions/DredgingWorkPermits/DredgedMaterialManagementOffice(DMMO).aspx)

DMMO DATABASE WEBSITE: www.dmмосfbay.org

LTMS WEBSITE: www.spn.usace.army.mil/Missions/DredgingWorkPermits/LTMS.aspx

LTMS 12-YEAR REVIEW:

www.spn.usace.army.mil/Missions/DredgingWorkPermits/LTMS/LTMSProgram12YearReviewProcess.aspx

PROGRAMMATIC EFH CONSULTATION AGREEMENT and MERCURY UPDATE:

www.spn.usace.army.mil/Portals/68/docs/Dredging/LMTS/LTMS%20EFH%20full%20signed%20agreement%20FINAL%206-9-2011.pdf

www.spn.usace.army.mil/Portals/68/docs/Dredging/LMTS/EFH_Modification_Mercury_Bioaccumulation_Testing.pdf

PROGRAMMATIC ESA CONSULTATION:

https://pcts.nmfs.noaa.gov/pcts-web/dispatcher/trackable/WCR-2014-1599?overrideUserGroup=PUBLIC&referrer=%2fpcts-web%2fpublicAdvancedQuery.pcts%3fsearchAction%3dSESSION_SEARCH

APPENDICES

Appendix 1. 2014 Dredging Volumes by Project (Cubic Yards)

Project	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2014 'in-situ' VOL (cy)
AMPORTS - BENICIA PORT TERMINAL COMPANY; SF-9	0	0	0	0	0	0	0	0	0	3,818	0	0	3,818
AMPORTS - BENICIA PORT TERMINAL COMPANY;	0	0	0	0	0	0	0	0	0	13,617	0	0	13,617
BAE SYSTEMS - San Francisco Drydock; SF-11	0	0	0	0	0	0	0	0	0	19,056	0	0	19,056
BAE SYSTEMS - San Francisco Drydock; Montezuma	0	0	0	0	0	0	0	33,822	0	30,067	0	0	63,889
BENICIA MARINA; SF-9	0	0	0	0	0	0	0	0	0	0	0	3,843	3,843
BP WEST COAST PRODUCTS, RICHMOND TERMINAL; SF-11	0	0	0	0	0	0	0	0	0	0	11,336	0	11,336
CHEVRON RICHMOND LONG WHARF; SF-11	0	0	0	0	0	0	0	0	0	26,672	0	0	26,672
CHEVRON RICHMOND LONG WHARF; Montezuma/Reuse	0	0	0	0	0	0	0	0	0	86,100	19,979	0	106,079
MARE ISLAND DRYDOCK; Cullinan Ranch/Reuse	0	0	0	0	0	0	32,610	19,031	9,324	0	0	0	60,965
NAPA VALLEY MARINA; Upland/Reuse	0	0	0	0	0	0	0	6,400	7,540	2,260	0	0	16,200
PARADISE CAY HOMEOWNERS; SF-11	0	0	0	0	0	0	0	0	1,917	5,044	12,443	336	19,740
PHILLIPS 66 (CONOCO), RODEO TERMINAL; SF-8/Reuse	0	0	0	0	0	0	0	0	0	5,628	0	0	5,628
PHILLIPS 66 (CONOCO), RICHMOND TERMINAL; Montezuma/Reuse	0	0	0	0	0	0	0	0	0	0	18,695	0	18,695
PORT OF OAKLAND, BERTH Maintenance; Montezuma/Reuse	0	0	0	0	0	0	0	0	69,157	0	0	0	69,157
PORT OF REDWOOD CITY, F-DOCK; OCEAN	0	0	0	0	0	0	0	0	0	0	3,615	0	3,615
PORT OF SAN FRANCISCO, ISLAIS CREEK, PIERS 92/94/96; SF-11	0	0	0	0	0	0	0	0	34,007	0	0	0	34,007
PORT OF SAN FRANCISCO, PIER 27; SF-11	0	0	0	0	0	0	0	55,552	1,987	0	0	0	57,539
PORT OF SAN FRANCISCO, PIER 27; OCEAN	0	0	0	0	0	0	0	35,025	16,164	0	0	0	51,189
PORT OF SAN FRANCISCO, PIER 35 E&W; OCEAN	0	0	0	0	0	0	0	0	0	39,152	0	0	39,152
SAN FRANCISCO MARINA, West Basin; Upland - Rock Quarry	0	0	0	0	0	0	0	0	9,731	0	1,695	0	11,426
STRAWBERRY CHANNEL; SF-11	0	0	0	0	0	0	0	8,352	4,539	10,288	17,550	5,205	45,934
TESORO REFINERY, AVON TERMINAL; Winter Island/Reuse	0	0	0	0	0	0	0	0	0	0	2,472	0	2,472
VALERO REFINERY TERMINAL; Upland/Reuse	0	0	2,641	0	0	17,457	6,484	0	0	0	0	0	26,582
VALLEJO MARINA, City of; SF-9	0	0	0	0	0	0	0	2,771	26,787	11,084	0	0	40,642
VALLEJO YACHT CLUB; SF-9	0	0	0	0	0	0	0	0	3,067	6,133	0	0	9,200
USACE, MAIN SHIP CHANNEL; SF-8	0	0	0	0	0	(122,409)	0	0	0	0	0	0	(122,409)
USACE, MAIN SHIP CHANNEL; SF-17, Ocean Beach	0	0	0	0	0	(117,609)	0	0	0	0	0	0	(117,609)
USACE, OAKLAND INNER & OUTER HARBOR; Montezuma/Reuse	0	0	0	0	0	0	0	50,000	50,000	36,358	45,700	159,750	341,808**
USACE, PINOLE SHOAL CHANNEL; SF-9	0	0	0	0	0	0	0	20,333	0	0	0	0	20,333
USACE, PINOLE SHOAL CHANNEL; SF-10	0	0	0	0	0	0	133,631	11,741	0	0	0	0	145,372
USACE, REDWOOD CITY HARBOR; SF-10	0	0	0	0	0	0	0	0	0	0	67,143	43,529	110,672
USACE, REDWOOD CITY HARBOR; SF-11	0	0	0	0	0	0	0	0	0	30,410	253,300	0	283,710
USACE, RICHMOND OUTER - Essayons; SF-11	0	0	0	0	0	10,449	163,413	0	0	0	0	0	173,862
USACE, RICHMOND OUTER - Essayons; SF-10	0	0	0	0	0	0	4,144	0	0	0	0	0	4,144
USACE, RICHMOND OUTER - Contractor; SF-10	0	0	0	0	0	0	0	0	0	0	50,212	22,824	73,036
USACE, RICHMOND INNER - Contractor; OCEAN	0	0	0	0	0	0	0	0	0	0	36,050	0	36,050
USACE, RICHMOND INNER - Contractor; Montezuma/Reuse	0	0	0	0	0	0	0	0	0	0	34,100	0	34,100**
USACE, SUISUN BAY CHANNEL; SF-16	0	0	0	0	0	0	0	130,415	0	0	0	0	130,415
TOTAL	0	0	2,641	0	0	27,906	340,282	373,442	234,220	308,252	504,140	305,637	2,113,955

^ BIN volume / no post dredge survey or incomplete data

** Dredging continued into 2015

Red = SF-8
Pink = SFDODS (Deep Ocean Site)

Orange = SF-9 (Carquiniz)
Green = Upland/Reuse

Brown = SF-10 (San Pablo)
Gray = SF-16 (Suisun Bay)

Blue = SF-11 (Alcatraz)

Appendix 2. 2014 Disposal Sites and Volumes Disposed (Cubic Yards)

Disposal Site	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2014 Total Volume (cy)*
SF-9, Carquinez Straits	0	0	0	0	0	0	0	23,104	29,854	21,035	0	3,843	77,836
SF-10, San Pablo Bay	0	0	0	0	0	0	137,775	11,741	0	0	117,355	66,353	333,224
SF-11, Alcatraz	0	0	0	0	0	10,449	163,413	63,904	42,450	91,470	294,629	5,541	671,856
SF-16, Suisun Bay	0	0	0	0	0	0	0	130,415	0	0	0	0	130,415
TOTAL in-Bay (excluding USACE Main Ship Channel)	0	0	0	0	0	10,449	301,188	229,164	72,304	112,505	411,984	75,737	1,213,331 *
Reuse, Upland (USACE MSC), SF-8, etc.	0	0	2,641	0	0	17,457	39,094	109,253	145,752	174,030	88,541	193,850	770,618
SF-DODS, Deep Ocean Disposal Site	0	0	0	0	0	0	0	35,025	16,164	39,152	3,615	36,050	130,006
GRAND TOTAL	0	0	2,641	0	0	27,906	340,282	373,442	234,220	325,687	504,140	305,637	2,113,955 *

*Excluding MSC

Appendix 3. 2014 LTMS Non-USACE Maintenance Dredging Project Programmatic EFH Consultation Compliance

Project Name/Episode Number	Placement Site	File Number	Dredge Date	Permit Area	Episode Area	Dredge Volume	EFH Compliance Issues
Amports - Benicia Port Terminal	SF-9, MWRP	28097N	Oct	5.5	4.3	17,435	No eelgrass within 250 meters. No EFH issues associated with episode.
BAE Systems	MWRP and SF-11	400192	Aug-Oct	13.4	6.8	82,945	No eelgrass within 250 meters. No EFH issues associated with episode.
Benicia Marina	SF-9	2014-00061S	Dec	16.96	4.27	3,843	No eelgrass within 250 meters. No EFH issues associated with episode.
BP Richmond	SF-11	28551S	Nov	2.2	2.2	11,336	No eelgrass within 250 meters. No EFH issues associated with episode.
Chevron Long Wharf	SF-11 and MWRP	2009-00052S	Dec	44.1	26.33	132,751	No eelgrass within 250 meters. No EFH issues associated with episode.
Mare Island Dry Dock	CRRP	2008-00311N	Jul-Sept	18.31	3.68	60,965	No eelgrass within 250 meters. No EFH issues associated with episode.
Napa Valley Marina	Upland	2012-00308N	Aug. - Oct.	8.8	1.9	16,200	No eelgrass within 250 meters. No EFH issues associated with episode.
Paradise Cay Homeowners (CSA 29)	SF-11	29020S	Sept. - Nov.	10.8	6.97	19,740	Eel grass within 250 meters. Silt curtain deployed according to eelgrass protection plan to protect eelgrass beds.

Phillips 66, Richmond	MWRP	20132-00171S	Nov	2.3	2.3	18,695	No eelgrass within 250 meters. DDT in Z-layer composite & in 2 of 9 individual z-layer samples exceeded BT. TBP calc. on highest sample conc. predicted invertebrate tissue conc. at least 10 times less than TRVs.
Phillips 66, Rodeo	SF-8	28482S	Oct	16.7	1.78	5,628	No eelgrass within 250 meters. No EFH issues associated with episode.
Port of Oakland Berths 22, 23, 25, 26, 30, 32, 35, 37, 55, 56, 57, 58, and 59 Maintenance Dredging	MWRP	2014-00090S	Sept. - Nov.	23.62	10.76	69,157	No eelgrass within 250 meters. No EFH issues associated with episode.
Port of Redwood City F-Dock	SF-DODS	201200340S	Nov	0.049	0.049	3,615	No eelgrass within 250 meters. No EFH issues associated with episode.
Port of San Francisco, Berth 27	SF-11 and SF-DODS	2013-00333S	Aug.	9.6	9.6	108,728	No eelgrass within 250 meters. No EFH issues associated with episode.
Port of San Francisco, Berth 35	SF-DODS	2013-00333S	Oct.	8	11.5	39,152	No eelgrass within 250 meters. No EFH issues associated with episode.
Port of San Francisco, Islais Creek Channel and Approach, Berths 92, 94, and 96 Maintenance Dredging	SF-11	2013-00333S	Sept.	35.7	6.31	34,007	No eelgrass within 250 meters. No EFH issues associated with episode.
San Francisco Marina West Basin, Sediment Trap Maintenance Dredge	SRRQ	2008-00074S	Sept.	1.82	1.68	11,426	No eelgrass within 250 meters. No EFH issues associated with episode.
Strawberry Channel	SF-11	2011-00267	Aug-Dec	17.5	16.5	45,934	No eelgrass within 250 meters. No EFH issues associated with episode.

Tesoro Golden Eagle	WI	2012-00106S	Nov	0.73	0.73	2,472	No eelgrass within 250 meters. No EFH issues associated with episode.
Valero Refining Company	MWRP	2012-00248	Mar and Jun-Jul	5.48	2.81	26,582	No eelgrass within 250 meters. No EFH issues associated with episode.
Vallejo Marina	SF-9	2012-0057S	Aug-Oct	29	4.48	40,642	No eelgrass within 250 meters. No EFH issues associated with episode.
Vallejo Yacht Club Marina	SF-9	2013-00139S	Aug. - Oct.	6	1.4	9,200	No eelgrass within 250 meters. No EFH issues associated with episode.

SF-8 = San Francisco Bar Channel
SF-9 = Carquinez Disposal Site
SF-10 = San Pablo Bay Disposal Site
SF-11 = Alcatraz Disposal Site
WI = Winter Island
MWRP = Montezuma Wetlands Restoration Project

CRRP = Cullinan Ranch Restoration Project
SRRQ = San Rafael Rock Quarry
BT = Bioaccumulation Testing Trigger
TBP = Theoretical Bioaccumulation Potential
TRV = Toxicity Reference Value

Appendix 4. 2014 LTMS USACE Maintenance Dredging Projects Programmatic EFH Agreement Compliance

Project Name	Placement Site	Dredge Used	Dredge Month(s) 2014	Total Area of Project (Acres)	Area Dredged (Acres)	Volume: Cubic Yards (CY)	EFH Compliance Issues
Oakland Inner Harbor and Outer Harbor	MWRP	Clamshell	Aug. - Dec.	776.14	110.87	341,808	Eelgrass within 250 meters of dredging. Eelgrass surveys and impact analysis completed. No adverse effects to eelgrass were determined. (Note: Project completed in January 2015 - total volume = 389,894 cy)
Pinole Shoal Channel	SF-9, SF-10	Hopper	July - Aug.	879.07	60.79	165,705	No eelgrass within 250 meters. No EFH issues associated with episode
Redwood City Harbor	SF-10, SF-11	Clamshell	Oct. - Dec.	209.04	65.32	394,382	No eelgrass within 250 meters. No EFH issues associated with episode
Richmond Inner Harbor	SF-10, SF-DODS, MWRP	Clamshell	Dec.	258.02	104.54	70,150	Eelgrass within 250 meters of dredging. Eelgrass surveys and impact analysis completed. No adverse effects to eelgrass were determined. (Note: Project completed in March 2015 - total volume = 411,289 cy)
Richmond Outer Harbor	SF-10, SF-11	Hopper, Clamshell	June - July, Nov. - Dec.	662.42	103.1	251,042	No eelgrass within 250 meters. No EFH issues associated with episode
S.F. Main Ship Channel	SF-8, OBDS	Hopper	June	1203.59	52.6	240,018	No eelgrass within 250 meters. No EFH issues associated with episode
Suisun Bay Channel (including New York Slough and Bulls Head Reach)	SF-16	Hopper	August	805.85	23.44	130,415	No eelgrass within 250 meters. No EFH issues associated with episode