

**California Regional Water Quality Control Board
San Diego Region
Cleanup Team**

RESPONSES TO SELECTED WRITTEN COMMENTS ON

Revisions to Tentative Cleanup and Abatement Order No. R9-2011-0001 and Draft Technical Report for the Shipyard Sediment Site, San Diego Bay (dated September 15, 2011)

Proposed Final Environmental Impact Report Shipyard Sediment Remediation Project, San Diego Bay, California (released on September 15, 2011)

AND REVISIONS TO

Tentative Cleanup and Abatement Order No. R9-2011-0001 and Draft Technical Report

Proposed Final Environmental Impact Report

November 2, 2011

STATE OF CALIFORNIA

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MATT RODRIQUEZ, Agency Secretary, California Environmental Protection Agency



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INTRODUCTION

Consistent with the Third Amended Order of Proceedings, as amended by the Hearing Outline dated July 12, 2011, this report responds to written comments the on:

- *Revisions to Tentative Cleanup and Abatement Order No. R9-2011-0001 and Draft Technical Report for the Shipyard Sediment Site, San Diego Bay* dated September 15, 2011. Comments were received from NASSCO and BAE Systems.
- *Proposed Final Environmental Impact Report (EIR), Shipyard Sediment Remediation Project, San Diego Bay, California* (released on September 15, 2011). Comments were received from NASSCO and the U.S. Fish and Wildlife Service.

This report also provides revisions to:

- Tentative Cleanup and Abatement Order (TCAO) R9-2001-0001, and the Draft Technical Report (DTR). The revisions were made in by the San Diego Water Board's Cleanup Team (Cleanup Team) in response to the October 19, 2011 comments received, and to correct typographical, style, format, and other errors needed for clarity and consistency. Revisions are shown in underline/strikeout text.
- Proposed Final EIR (released on September 15, 2011). Revisions were made by the Cleanup Team in response to comments received on the Proposed Final EIR, and to correct language errors on specific pages needed for clarity and consistency. Revisions are shown in underline/strikeout text.
- Tentative Resolution No. R9-2011-0072 Certifying the Final EIR for the Shipyard Sediment Remediation Project, San Diego Bay, California. The Cleanup Team made revisions to correct language errors on specific pages needed for clarity and consistency. Revisions are shown in underline/strikeout text.

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RESPONSES TO SELECTED WRITTEN COMMENTS ON:

A. Revisions to Tentative Cleanup and Abatement Order No. R9-2011-0001 and Draft Technical Report for the Shipyard Sediment Site, San Diego Bay (dated September 15, 2011)

1. NASSCO's Comments A and B from October 19, 2011

Comment A. The Cleanup Team Must Specify The Oversight Costs For Which It Seeks Recovery, and Demonstrate That Such Expenditures Were Actually Incurred and Reasonable

Response

Pursuant to Water Code sections 13304 and 13365, NASSCO requested that the Cleanup Team either remove the cost recovery language from the TCAO, or enumerate the specific amounts for which recovery is sought, and provide the parties with copies of the materials supporting the recovery of the same, so that the parties can verify the expenses and evaluate whether or not the amounts claimed are reasonable.

To clarify, Tentative Cleanup and Abatement Order (TCAO) No. R9-2011-0001 requires cost recovery under authority of Water Code section 13304 only. Furthermore, the cost recovery procedures in Water Code section 13365 do not govern the recovery of costs authorized by Water Code section 13304. Nonetheless, NASSCO's request for documentation of the costs sought for reimbursement is reasonable. The documentation supporting the specific amounts intended to be recovered is in the Appendix to this report. TCAO Finding 41 has been revised to reflect the costs below:

- \$109,908 for the DM Information Services, Inc. contract to produce the electronic administrative record.
- \$43,287 for the Department of Fish and Game contract for technical consultation services on the fish histopathology and bile studies, and the wildlife risk assessments. This contract involved two projects, the Shipyard Sediment Site and the BF Goodrich site. The spreadsheet titled "Department of Fish and Game Technical Consultation Services" displays the breakdown of the invoiced costs between the two projects. The invoices provide the hours billed to the two projects and the total cost. A ratio of the hours was used to determine the fraction of the total charged to the Shipyard Sediment Site project.
- \$12,009 for the Office of Environmental Health Hazard Assessment contract for technical consultation services on the human health risk assessments.
- \$400,094 for unreimbursed staff services costs. The Appendix to this report includes a summary spreadsheet showing total annual costs from Fiscal Year (FY) 2003-2004 through FY 2010-2011. Note that there are no charges from FY 2007-2008 through FY

2009-2010. Additional spreadsheets breakdown the costs for each FY by staff member, hours, hourly rate, and total amount charged.

- The unpaid invoices billed to NASSCO through June 30, 2011 total \$374,737. The Cleanup Team intends to update this figure to include the invoice for the July 1 through September 30, 2011 period which has not yet been billed. The State Water Resources Control Board should send NASSCO the invoice before the December hearing date for TCAO adoption.
- \$2,889 for the Environmental Impact Report filing fee and the County Clerk processing fee.

The LSA Contract and SCCWRP contract mentioned in Finding 41 have yet to be executed. Thus, there are unlikely to be recoverable costs associated with these pending contracts before the adoption of the TCAO. References to these pending contracts have been deleted from TCAO Finding 41. Revised Finding 41 can be found in Revisions - Section A.

Comment B. The Cleanup Team Must Clarify That Oversight Costs Related To Mediation Are Properly Shared Between All Parties To The Mediation

Response

NASSCO commented that the Cleanup Team singles out NASSCO, and forecasts its intent to recover unspecified sums for “unpaid invoices billed to NASSCO,” noting that “NASSCO has not paid the entire amount billed to its cost recovery account.” NASSCO believes that this statement is misleading, and requested that the TCAO be further revised to enumerate and support the specific costs sought, and make clear that costs pertaining to the TCAO, mediation and related proceedings are properly billed to, and split amongst, all Designated Parties that participated in the same.

The Cleanup Team does not need to apportion the costs incurred during mediation to all designated parties. Apportionment was not stipulated upon entry into mediation and moreover, the San Diego Water Board may charge any one or more responsible parties jointly and severally for oversight costs. The TCAO does not single out NASSCO as responsible for paying its unpaid invoices. Rather, TCAO Provision G.1 seeks reimbursement of this cost, and all others, from all of the Dischargers named in the Order. How those costs are apportioned among the Dischargers must be decided by the Dischargers.

Nevertheless, the Cleanup Team recognizes that NASSCO and BAE Systems are not the only dischargers responsible for cleanup at the Shipyard Sediment Site, but are the only dischargers currently billed for staff costs. Therefore, the Cleanup Team intends to establish a single Cleanup and Abatement Cost Recovery Account chargeable to all of the Dischargers named in the TCAO. This account will be used to recover staff costs pursuant to Water Code sections 13304 and 13365. To facilitate this, the Dischargers will need to designate a single party or entity to receive invoices and make payments. Provision G.1. has been revised to require the Dischargers to provide the San Diego Water Board with the name of a party or entity for this

purpose (see Revisions - Section A). The name and mailing address of the party or entity must be received by the San Diego Water Board within 30-days following adoption of the TCAO. The Cleanup Team can set up this new cost recovery account as soon as the party or entity to handle billing and payment is identified. The Dischargers need not wait until the TCAO is adopted to do this.

2. BAE Systems' Comments I.A, I.B, and I.C from October 19, 2011

Comment I.A. Revised DTR Pages 18-4 and 18-5

BAE Systems commented that there are additional considerations demonstrating that there is ample site specific data to evaluate the potential effects of on tributyltin (TBT) on benthic community health, even without including TBT in the SQGQ1 calculation, which could be included in the revised DTR text. The considerations include recognition that a site specific Lowest Apparent Effects Threshold (LAET) toxicity threshold value for TBT was developed and applied to ensure that areas of the Site exceeding the threshold are included in the remedial footprint. BAE Systems also commented that appropriateness of the use of other chemicals as a surrogate for TBT can be further supported by reference to the chemical correlation coefficients for TBT and copper, HPAH, and total PCB which indicate that cleanup decisions based on SQGQ1 values will address areas with elevated TBT values. The Cleanup Team agrees with the recommendation and has modified DTR Pages 18-4 and 18-5 as suggested. Please see Revisions - Section B.

Comment I.B. Revised DTR Page 32-12

Response

BAE Systems commented that in the modified paragraph the abbreviated quote from the text “all wildlife receptors (excluding the sea lion)” is an important piece of information and recommends omitting the parentheses. The Cleanup Team agrees with the recommendation and has revised DTR Page 32-12 as suggested. Please see Revisions - Section B.

Comment I.C. Revised DTR Page 34-3

Response

BAE Systems commented that in the revised text the phrase “post-remedial dredge area concentrations” is ambiguous and recommends that it should be clarified or replaced. The Cleanup Team agrees that the revised text phrase is ambiguous. The phrase “post-remedial dredge area concentrations” refers to background sediment chemistry concentrations, the phrase used in the original text. The Cleanup Team has revised DTR Page 34-3 to replace “post-remedial dredge area concentrations” with the original phrase “background sediment chemistry levels.” Please see Revisions - Section B.

B. Proposed Final Environmental Impact Report Shipyard Sediment Site Remediation Project, San Diego Bay, California (released on September 15, 2011)

NASSCO's Comments on the Proposed Final EIR from October 19, 2011

NASSCO's October 19, 2011 comments on the FEIR largely repeat the comments it submitted on the Draft EIR, which have already been responded to by the Cleanup Team in the FEIR. Nevertheless, the Cleanup Team provides the following additional responses to clarify some of the issues raised by NASSCO.

Comment I.A. Mitigation Measures Proposed in the FEIR Must Be Economically Feasible Under Resolution 92-49.

NASSCO argues that case law, viewed in the light of State Water Resources Control Board Resolution 92-49, prohibits the San Diego Water Board from adopting measures to mitigate the identified significant adverse environmental impacts that the TCAO Project will have on the environment. NASSCO argues that the San Diego Water Board may not adopt mitigation measures that have not been analyzed under Resolution 92-49 for economic feasibility because so doing would go beyond its regulatory authority. NASSCO's argument fails because economic feasibility analysis under Resolution 92-49 does not control over other considerations, and because there is no legal prohibition on adopting mitigation measures that help ensure cleanups result in the best water quality that is reasonable, or that cleanups achieve water quality consistent with the San Diego Basin Plan and other state and regional water quality objectives.

The cases cited by NASSCO do not support its analysis. In *Kenneth Mebane Ranches v. Superior Court* (1992) 10 Cal.App.4th 276, 291, the court held, not surprisingly, that a flood control district could not exercise its power of eminent domain outside its territorial boundaries to condemn property for environmental mitigation. The *Kenneth Mebane* court reasoned that the flood district was prohibited by statute from exercising its power of eminent domain extra-territorially except as a matter of legal necessity, holding that the requirement of "legal necessity" required a showing that the mitigation was a matter of "urgency or extreme expediency or necessity," or "essential to the declared objects" of the district's project. *Id.*, at 291-292. The court construed the flood district's power of condemnation narrowly under the specific language of the Code of Civil Procedure, reasoning that since the flood district could adopt a statement of overriding considerations, there was no urgency or necessity to the extra-territorial taking. *Ibid.*

Similarly, in *Sequoyah Hills Homeowners Association v. City of Oakland* (1993) 23 Cal.App.4th 704, 715-16, the court held that prohibitory language in the Government Code forbade Oakland from requiring a density reduction as mitigation for a housing project unless there was a specific, adverse impact upon the public health or safety that could not be mitigated without lowering density. *Id.*, at 715. In each case, countervailing, specific Legislative pronouncements about public policy and agency limitations colored the courts' analyses. In *Kenneth Mebane*, the court was balancing the flood district's granted statutory authority against constitutional limits on a government agency's power to take private property for public use only after making evidence

supported findings that doing so is necessary for a lawful public purpose. In *Sequoyah Hills*, the court was balancing the need to offset environmental impacts against the Legislature’s prohibition on so doing when affordable housing is at stake, noting the Legislature’s statement that affordable housing is a critical problem that threatens the quality of life in California and the expressed limitation on housing density reductions. To sum, both cases review CEQA’s mitigation requirements in light of specific Legislatively-adopted limits on the government agency’s authority.

Here, Resolution 92-49, read as a whole, is not prohibitory in the ways the Code of Civil Procedure and Government Code are. The Resolution requires cleanups to “implement permanent cleanup and abatement solutions which do not require ongoing maintenance[.]” Section III.A. Allowing pollutants to spread unmitigated from the dredge footprint would be inconsistent with a permanent solution that does not require ongoing maintenance since chasing the pollutants around the Site would be required. Further, the Resolution expressly contemplates mitigation measures will be adopted as part of cleanups, mandating that waste discharge requirements (WDRs) be adopted when cleaned up contaminants are discharged to land for treatment, storage or disposal, as will be the case here. Section III .F(2)(b). Most critically, however, is the Resolution’s requirement that cleanups result in the “best water quality which is reasonable” if background levels cannot be restored “considering all demands being made and to be made on these water and the total values involved, beneficial and detrimental, economic and social, tangible and intangible[.]” Section III.G. If the TCAO Project’s impacts could not be lawfully mitigated, the San Diego Water Board could not order attainment of the best water quality that is reasonable. The Resolution further requires that any cleanup approved “[n]ot result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards[.]” Section III.G(3). NASSCO’s reading of the Resolution elevates economic feasibility over all other considerations in the Resolution, which is impermissible. Economic feasibility applies to cleanup levels, and is but one of the considerations in play – not to specific mitigation measures. Under NASSCO’s reading of the Resolution, if a mitigation measure does not result in an incremental benefit to pollution exposure reduction and it has a cost, it cannot be adopted because it is “legally infeasible.” If that were the case, the San Diego Water Board would be required to approve a cleanup plan even though dredging activities could result in existing pollutants being mobilized and spread throughout the Site. The San Diego Water Board would be required under NASSCO’s view to approve a cleanup plan without mitigation that violates the Basin Plan and/or other water quality objectives. These results would be absurd and inconsistent with the purposes of Resolution 92-49. There are simply no mandatory prohibitions against adopting mitigation measures in Resolution 92-49 like those analyzed by the *Kenneth Mebane* and *Sequoyah Hills* courts. In fact, Resolution 92-49 expressly contemplates that cleanups will be conditioned and their impacts controlled. *See* Section III.F *passim*.

Comment I.B The Regional Board May Not Use CEQA Mitigation To Dictate Cleanup Methods.

NASSCO argues that Water Code section 13360(a) prohibits the water boards from specifying how a discharger is to comply with a cleanup and abatement order. The Cleanup Team has

proposed performance standards that must be met by the dischargers to ensure that the significant adverse environmental effects of the Project are mitigated and that dredging and other remedial activities do not result in water quality less than that prescribed in the Basin Plan or other applicable water quality plans and policies. The use of performance standards as mitigation measures is common under CEQA. See eg's. *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 895; *Clover Valley Foundation v. City of Rocklin* (2011) 197 Cal.App.4th 200, 237. The FEIR specifically provides that:

It is anticipated that a subsequent discretionary approval(s) will be required to fully comply with the directives of the TCAO Project. Subsequent discretionary approvals will include, at a minimum, a specific Remedial Action Plan requiring a Clean Water Act permit. To the extent it can be demonstrated on the basis of substantial evidence that alternative mitigation measures to those set forth herein are equally or more effective at mitigating the identified potentially significant adverse environmental impacts and at protecting the environment, those mitigation measures may be adopted in lieu of those set forth herein at the time subsequent discretionary approvals are granted.

Thus, the dischargers are in control of the specific aspects of project design and the design of mitigation measures that meet the performance standards the San Diego Water Board has set, and the San Diego Water Board is not dictating the method of compliance with these performance standards.

Comment III The FEIR Fails to Describe Storm Water Discharges To The Site or Evaluate Potential Recontamination

NASSCO argues that the FEIR fails to describe the potential for site recontamination and fails to analyze the potentially significant effects of recontamination from Chollas Creek on the Site. NASSCO's argument "turns CEQA upside down." See *South Orange County Wastewater Authority v. City of Dana Point* (2011) 196 Cal.App.4th 1604, 1614. CEQA does not concern itself with mitigating the environment's impacts on a project, or a project's ability to alleviate adverse existing conditions, but, rather, CEQA is solely concerned with mitigating the impacts of a project on the environment. *Id.*, at 1614-1615. Whether Chollas Creek is currently contributing contaminants to the Site, and whether future contributions may impact beneficial uses at the Site, are not cognizable legal inquiries and "turn CEQA upside down" because they simply do not address the issue of how the remedial project contemplated under the TCAO impacts the environment. NASSCO's argument is essentially one that addresses the efficacy of the TCAO Project itself. Accordingly, it has been addressed at length in the TCAO, DTR and Response to Comments, which provide that recontamination from Chollas Creek is not likely to prevent remedy success in light of upland source control measures and the contemplated Chollas Creek TMDL actions that are currently underway.

Comment XII The Project Is Categorically Exempt From CEQA

The Cleanup Team calls the San Diego Water Board's attention to this argument by NASSCO merely to illustrate the inconsistencies in NASSCO's CEQA and other arguments and comments, and the limitless depths to which NASSCO is willing to sink to criticize the proposed TCAO Project. In one breath, NASSCO argues both that the TCAO Project is categorically exempt from CEQA, but that the FEIR is flawed because it fails to adequately identify storm water impacts from Chollas Creek, imposes infeasible mitigation measures on the dischargers, fails to consider a reasonable range of alternatives, fails to adequately set forth the environmental baseline, and has an insufficient cumulative impacts analysis. NASSCO's inconsistent arguments and legal positions strain credibility.

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REVISIONS TO:

A. Tentative Cleanup and Abatement Order No. R9-2011-0001

This section contains pages from the TCAO that have been revised in response to the comments as discussed in the previous section. In addition to the revisions in response to comments, the Cleanup Team proposes revisions to TCAO Finding 32 and to DTR Section 32 with respect to the findings required by Resolution No. 92-49. Response 31-1 in the September 15th Response to Comments Report contains an extensive discussion clarifying the findings required by Resolution No. 92-49 when setting alternative cleanup levels greater than background. Specifically, alternative cleanup levels must result in the best water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. Unfortunately, Finding 32 and DTR Section 32 were not subsequently revised to reflect the discussion in the Response to Comments Report. Finding 32 is misleading in its statement that “Resolution No. 92-49 requires that alternative cleanup levels must be set at the lowest levels the discharger demonstrates and the San Diego Water finds is technologically and economically achievable.” This language comes from Title 27 of the California Code of Regulations section 2550.4 which Resolution No. 92-49 says to apply when setting alternative cleanup levels. While the Cleanup Team believes that the alternative cleanup levels proposed in the TCAO are the lowest concentrations that are economically achievable, this consideration cannot be the sole consideration, or a stand-alone requirement for setting alternative cleanup levels in light of the “total values involved” considerations mandated by Resolution No. 92-49. For a full explanation, please see Response 31-1 in the Response to Comments Report.

Finding 32 and DTR Section 32 had been revised to clarify the language of Resolution No. 92-49 with respect to setting alternative cleanup levels that will result in the best water quality which is reasonable in consideration of the total values involved. See Section B.

The Cleanup Team also revised Directives D.4 and D.5 pertaining to the post-remedial monitoring. The TCAO requires the Dischargers to analyze whether or not the remedial goals of the cleanup have been attained. Only the exceedence of a SWAC trigger concentration, however, requires the Dischargers to investigate, characterize, and report on the cause of the exceedence, and to propose an approach to address the exceedence.

The SWAC trigger concentrations are the benchmarks for determining whether the post-remedial SWACs have been maintained at the site during the Post-Remedial monitoring period. The SWAC trigger concentrations, however, are the remedial goal for the protection of aquatic-dependent wildlife and human health-related beneficial uses, not aquatic life-related beneficial uses. The principal remedial goals for assessing aquatic life-related beneficial use protection are the SS-MEQ and 60% LAET thresholds. Therefore, TCAO Directives D.4 and D.5 have been revised to require an investigation and characterization of, and report on an exceedence of an SS-MEQ or 60% LAET threshold, in addition to an exceedence of a SWAC trigger concentration.

The rest of this section is comprised of the individual pages of the TCAO that were revised by the Cleanup Team. The pages are presented in the order of their page numbers with revisions shown in underline and strikeout format.

forth in detail herein, this comparison revealed that the incremental benefit of cleanup diminishes significantly with additional cost beyond a certain cleanup level, and asymptotically approaches zero as remediation approaches background. Based on these considerations, cleaning up to background sediment chemistry levels is not economically feasible.

ALTERNATIVE SEDIMENT CLEANUP LEVELS

32. **ALTERNATIVE CLEANUP LEVELS.** Under State Water Board Resolution No. 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*, the San Diego Water Board may prescribe alternative cleanup levels less stringent than background sediment chemistry concentrations if attainment of background concentrations is technologically or economically infeasible. Resolution No. 92-49 requires that alternative levels must result in the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on these waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. ~~be set at the lowest levels the discharger demonstrates and the San Diego Water Board finds is technologically and economically achievable.~~ Resolution No. 92-49 further requires that any alternative cleanup level shall: (1) be consistent with maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial uses of such water; and (3) not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.

The San Diego Water Board is prescribing the alternative cleanup levels for sediment summarized in the table below to protect aquatic life, aquatic-dependent wildlife, and human health based beneficial uses consistent with the requirements of Resolution No. 92-49. Compliance with alternative cleanup levels will be determined using the monitoring protocols summarized in Finding 34 and described in detail of Section 34 of the Technical Report.

Table 2. Alternative Cleanup Levels: Shipyard Sediment Site

Aquatic Life	Aquatic Dependent Wildlife and Human Health	
Remediate all areas determined to have sediment pollutant levels likely to adversely affect the health of the benthic community.	Surface Weighted Average Concentrations (site-wide)	
	Copper	159 mg/kg
	Mercury	0.68 mg/kg
	HPAHs ¹	2,451 µg/kg
	PCBs ²	194 µg/kg
	Tributyltin	110 µg/kg

1. HPAHs = sum of 10 PAHs: Fluoranthene, Pyrene, Benz[a]anthracene, Chrysene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[a]pyrene, Indeno[1,2,3-c,d]pyrene, Dibenz[a,h]anthracene, and Benzo[g,h,i]perylene.

for Investigation and Cleanup and Abatement of Discharges Under Water Code section 13304; and (5) relevant standards, criteria, and advisories adopted by other state and federal agencies.

37. **CALIFORNIA ENVIRONMENTAL QUALITY ACT.** In many cases, an enforcement action such as this could be exempt from the provisions of the California Environmental Quality Act (“CEQA”; Public Resources Code, section 21000 et seq.), because it would fall within Classes 7, 8, and 21 of the categorical exemptions for projects that have been determined not to have a significant effect on the environment under section 21084 of CEQA.⁴ In Resolution No. R9-2010-0115 adopted on September 8, 2010, the San Diego Water Board found that because the tentative CAO presents unusual circumstances and there is a reasonable possibility of a significant effect on the environment due to the unusual circumstances, the tentative CAO is not exempt from CEQA and that an EIR analyzing the potential environmental effects of the tentative CAO should be prepared.

As the lead agency for the tentative CAO, the San Diego Water Board prepared an EIR that complies with CEQA. The San Diego Water Board has reviewed and considered the information in the EIR.

38. **PUBLIC NOTICE.** The San Diego Water Board has notified all known interested persons and the public of its intent to adopt this CAO, and has provided them with an opportunity to submit written comments and recommendations.
39. **PUBLIC HEARING.** The San Diego Water Board has considered all comments pertaining to this CAO submitted to the San Diego Water Board in writing, or by oral presentations at the public hearing held on [date(s) to be inserted]. Responses to relevant comments have been incorporated into the Technical Report for this CAO. In the event that the San Diego Water Board proposes any changes to the Tentative CAO deemed material by the Dischargers, the Dischargers reserve their right to complete the administrative process delineated in the Final Discovery Plan and Second Amended Order of Proceedings, including the rights to conduct discovery, to cross-examine witnesses, and to submit rebuttal evidence, comments and initial and final briefs, subject to revised deadlines to be set by the San Diego Water Board or its designated Presiding Officer.
40. **TECHNICAL REPORT.** The “*Technical Report for Cleanup and Abatement Order No. R9-2011-0001 for the Shipyard Sediment Site, San Diego Bay, San Diego, CA*” is hereby incorporated as a finding in support of this CAO as if fully set forth here verbatim.
41. **COST RECOVERY.** Pursuant to Water Code section 13304, and consistent with other statutory and regulatory requirements, including but not limited to Water Code section 13365, the San Diego Water Board and the State Water Board are entitled to, and will seek reimbursement for all reasonable costs actually incurred to date by the San Diego Water Board and the State Water Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action required by this Order.

⁴ Title 14 CCR sections 15307, 15308, and 15321

Unreimbursed recoverable costs actually incurred by the San Diego Water Board and the State Water Board for the development and issuance of this Cleanup and Abatement Order fall into three categories as listed and described below.

- a. Contracts funded by the State Water Board Cleanup and Abatement Account or other San Diego Water Board contract funds for services in support of the development and issuance of this Cleanup and Abatement Order.
 - i. DM Information Services, Inc. produced the electronic administrative record. This work was paid for with Cleanup and Abatement Account funds and San Diego Water Board contract funds in the amount of \$109,908{insert amount}.
 - ii. The Department of Fish and Game provided technical consultation services on the fish histopathology and bile studies, and the wildlife risk assessments. This work was paid for with Cleanup and Abatement Account funds in the amount of \$43,287{insert amount}.
 - iii. The Office of Environmental Health Hazard Assessment provided technical consultation services on the human health risk assessments. This work was paid for with San Diego Water Board contract funds in the amount of \$12,009{insert amount}.
 - ~~iv. LSA provided technical oversight on the Responses to Comments on the Draft EIR, consultation services to complete the CEQA process. This work was paid for with Cleanup and Abatement Account funds in the amount of \${insert amount}.~~
 - ~~v. SCCWRP provided training and technical consultation services to the Advisory Team on sediment quality triad methods. This work was paid for with Cleanup and Abatement Account funds in the amount of \${insert amount}.~~
- b. Unreimbursed staff services costs. Due to Site Cleanup Program budget constraints, the San Diego Water Board was unable to bill all of the recoverable staff services costs to the NASSCO and BAE Systems cost recovery accounts. The unreimbursed staff costs total \$400,094{insert amount}.
- c. Unpaid invoices billed to NASSCO. NASSCO has not paid the entire amount billed to its cost recovery account. Based on the most current accounting available to the San Diego Water Board, the unpaid balance on the NASSCO cost recovery account amount is \$[amount to be determined] as of [insert date].
- ~~e-d. Filing fees for CEQA documents. Pursuant to Fish and Game Code Section 711.4, the San Diego Water Board must pay to the Department of Fish and Game a filing fee to defray the costs of managing and protecting California's vast fish and wildlife resources. The filing fee for the Environmental Impact Report is \$2,839.25 and the County Clerk Processing fee is 50.00 for a total of \$2,889.~~

4. **SWAC Trigger Concentration, SS-MEQ Threshold, or 60%LAET Threshold Exceedance Investigation and Characterization.** Post remediation monitoring may indicate exceedance of one or more of the post-remediation Site-Wide SWAC trigger concentrations, SS-MEQ thresholds, or 60%LAET thresholds. In that event the Dischargers shall conduct an Trigger-Exceedance Investigation and Characterization study to determine the cause(s) of the exceedance. There are several lines of investigation that may be pursued, individually or in combination, depending upon the type, scope, and scale of the exceedance(s) and site-specific conditions. The following approaches may be considered and implemented for the investigation and characterization effort:
 - a. Recalculation of the 95% UCL incorporating more recent sampling data (e.g. the dredge performance monitoring data, pre-remediation monitoring data from July, 2009, the most recent post remediation verification monitoring data etc.).
 - b. Identification of the specific subarea(s) that caused the excursion(s) using surrounding post remediation monitoring data and historical data as appropriate.
 - c. Evaluation of changes in site conditions as a result of disturbances since the previous sampling event from spills, major storm events, construction activities, newly discovered pollutant sources or other causes.
 - d. Analysis of the archived samples used to comprise the composite sample for the specific COC(s) exceeding the 95% UCL as a basis to understand which polygons have higher concentrations than expected. The data from this analysis could be used as a basis for spatial weighting of the data before recalculating 95% UCLs using interpolation methods such as inverse distance weighting.
5. **Trigger-Exceedance Investigation and Characterization Report.** The Dischargers shall prepare and submit an adequate Trigger-Exceedance Investigation and Characterization Report describing the final results of the investigation and characterization study to the San Diego Water Board. If the exceedances are found to be significant, the Report shall include a recommended approach, or combination of approaches, for addressing the exceedance(s) by additional sampling of the affected area, re-dredging, natural recovery, reanalysis following the next scheduled monitoring event, or other appropriate methods. The Report shall be due within 90 days of discovery of the exceedance or as otherwise directed by the San Diego Water Board.

E. QUARTERLY PROGRESS REPORTS

Quarterly Progress Reports. The Dischargers shall prepare and provide written quarterly progress reports which: (1) describe the actions which have been taken toward achieving compliance with this CAO during the previous quarter; (2) include all results of sampling, tests, and all other verified or validated data received or generated by or on behalf of the Dischargers during the previous quarter in the implementation of the remedial actions

E. QUARTERLY PROGRESS REPORTS

Quarterly Progress Reports. The Dischargers shall prepare and provide written quarterly progress reports which: (1) describe the actions which have been taken toward achieving compliance with this CAO during the previous quarter; (2) include all results of sampling, tests, and all other verified or validated data received or generated by or on behalf of the Dischargers during the previous quarter in the implementation of the remedial actions required by this CAO; (3) describe all activities including, data collection and other field activities which are scheduled for the next two quarters and provide other information relating to the progress of work, including, but not limited to, a graphical depiction of the progress of the remedial actions; (4) identify any modifications to the Remedial Action Plan or other work plan(s) that the Dischargers proposed to the San Diego Water Board or that have been approved by San Diego Water Board during the previous quarter; and (5) include information regarding all delays encountered or anticipated that may affect the future schedule for completion of the remedial actions required, and a description of all efforts made to mitigate those delays or anticipated delays. These progress reports shall be submitted to the San Diego Water Board by the (15th) day of March, June, September, and December of each year following the effective date of this CAO. Submission of these progress reports shall continue until submittal of the final Cleanup and Abatement Completion Report verifying completion of the Remedial Action Plan (RAP) for the Shipyard Sediment Site (see Directive C).

F. NO FURTHER ACTION

Upon approval by the San Diego Water Board of the Final Cleanup and Abatement Completion Report (Directive C) and the Post Remedial Monitoring Reports (Directive D.3) remedial actions and monitoring will be complete and compliance with this CAO will be achieved. At that time the San Diego Water Board will inform the Dischargers and other interested persons in writing that, based on available information, no further remedial work is required.

G. PROVISIONS

1. **Cost Recovery.** The Dischargers shall reimburse the State of California for all reasonable costs actually incurred by the San Diego Water Board and State Water Board to investigate, oversee, and monitor cleanup and abatement actions required by this CAO, including the cost to prepare CEQA documents according to billing statements prepared from time to time by the State Water Board. If the Dischargers are enrolled in a reimbursement program managed by the State Water Board for the discharge addressed by this CAO, reimbursement shall be made pursuant to the procedures established in that program.

Within 60 days of the adoption of this CAO, the Dischargers shall reimburse the State of California in the amount of \$[amount to be determined] for the unreimbursed costs actually incurred by the San Diego Water Board and State Water Board as described in Finding 41 of this Order.

Within 30 days of the adoption of this CAO, the Dischargers shall identify to the San Diego Water Board an entity or party authorized by the Dischargers to receive and pay invoices issued by the State Water Board Cost Recovery Program for staff oversight costs incurred by the San Diego Water Board to investigate, oversee, and monitor cleanup and abatement actions required by this CAO.

2. **Waste Management.** The Dischargers shall properly manage, store, treat, and dispose of contaminated ~~soils and ground water~~ marine sediment and associated wastes in accordance with applicable federal, state, and local laws and regulations. The storage, handling, treatment, or disposal of contaminated marine sediment and associated waste shall not create conditions of pollution, contamination or nuisance as defined in Water Code section 13050. The Dischargers shall, as required by the San Diego Water Board, obtain, or apply for coverage under, waste discharge requirements or a conditional waiver of waste discharge requirements for the removal of waste from the immediate place of release and discharge of the waste to (a) land for treatment, storage, or disposal or (b) waters of the state. No waste discharge requirements or conditional waiver of waste discharge requirements shall be required for disposal of marine sediment and associated waste in a landfill regulated under existing waste discharge requirements.
3. **Request to Provide Information.** The Dischargers may present characterization data, preliminary interpretations and conclusions as they become available, rather than waiting until a final report is prepared. This type of on-going reporting can facilitate a consensus being reached between the Dischargers and the San Diego Water Board and may result in overall reduction of the time necessary for regulatory approval.
4. **Waste Constituent Analysis.** Unless otherwise permitted by the San Diego Water Board, all analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. Specific methods of analysis must be identified. If the Dischargers propose to use methods or test procedures other than those included in the most current version of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846" (U.S. Environmental Protection Agency) or 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants; Procedures for Detection and Quantification", the exact methodology must be submitted for review and must be approved by the San Diego Water Board prior to use. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports submitted to the San Diego Water Board.

Any report presenting new analytical data is required to include the complete Laboratory Analytical Report(s). The Laboratory Analytical Report(s) must be signed by the laboratory director and contain:

- A complete sample analytical report.
- A complete laboratory quality assurance/quality control (QA/QC) report.
- A discussion of the sample and QA/QC data.

REVISIONS TO:

B. Draft Technical Report

This section is comprised of the individual pages of the DTR that were revised by the Cleanup Team. The pages are presented in the order of their page numbers with revisions shown in underline and strikeout format.

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It is important to note that SQGs are not promulgated as regulatory sediment quality criteria or standards in California nor are they intended as cleanup or remediation targets (Buchman, 1999). The SQGs used to classify the Shipyard Sediment Site stations include:

- ERM for metals (Long et al., 1998),
 - Consensus midrange effects concentration for PAHs and PCBs (Swartz, 1999; MacDonald et al., 2000), and
 - Sediment Quality Guideline Quotient (SQGQ) for chemical mixtures (Fairey et al., 2001).
- **Reference Sediment Quality Conditions** – A key step to evaluating each line-of-evidence comprising the Triad of data is to determine if there are statistically significant differences between a contaminated marine sediment site and reference station sites. To accomplish this it is necessary to specify the appropriate statistical procedure to estimate the level of confidence obtained when differentiating between reference and the contaminated marine sediment site conditions. The statistical procedure used by the San Diego Water Board in the Shipyard Sediment Site investigation to identify stations where conditions are significantly different from the Reference Sediment Quality Conditions consisted of identifying station sample values outside boundaries established by the 95% upper predictive limit reference pool of data for each contaminant of concern. The 95% upper predictive limit allows a one-to-one comparison to be performed between a single Shipyard Sediment Site station and the pool of reference stations used to establish “Reference Sediment Quality Conditions” for the Shipyard Sediment Site (Reference Pool). Although multiple comparisons are made to the Reference Pool prediction limits, the San Diego Water Board made a decision to not correct for multiple comparisons so that the Shipyard Site/Reference comparisons would remain conservative and more protective. Metals characteristics and summary statistics for the Reference Pool are shown in Table 18-2. The 95% upper predictive limit for metals was dependent on the fines content at each station to help identify concentrations of metals that were enriched at the Shipyard Sediment Site (Table 18-3). In general, this means that stations with higher fines content will have a higher 95% upper predictive limit. For example, the 95% upper predictive limit for copper ranged from 85.9 mg/kg for a fines content of 25% to 159.5 mg/kg for a fines content of 75%. Summary statistics and the 95% upper predictive limits for organic contaminants and the SQGQ1 for the Reference Pool are shown in Tables 18-4 and 18-5, respectively.
 - **Tributyltin (TBT) Considerations** - TBT is not specifically considered in the sediment chemistry line of evidence (LOE) analysis because 1) it is not incorporated in the combination of chemicals used in the SQGQ1 calculation and 2) there are no published empirical SQGs or consensus MEC values for TBT effects on benthic community health. The SQGQ1 metric, documented in Fairey et. al., (2001) and used in the analysis, is a central tendency indicator of the potential for adverse biological effects from chemical mixtures in a complex sediment matrix. Under the Fairey et. al., (2001) methodology, the SQGQ1 value for a sediment is calculated by dividing concentrations of cadmium, copper, lead, silver, zinc, total chlordane, dieldrin, total PAHs (normalized by sediment organic carbon content), and total PCBs (sum of 18 congeners) in sediment by each chemical's empirical SQG and subsequently averaging the individual quotients. The combination of chemicals used in the SQGQ1 calculation, which does not include TBT, are assumed to be representative of, or the surrogates of, the toxicologically significant chemical mixture regardless of which chemicals

were quantified in the sediment chemistry analyses. This is not only a well-accepted, but also a reasonable approach given the seemingly infinite number of chemicals present in marine sediment and for this reason it is not at all uncommon to exclude a specific chemical(s), such as TBT, in the chemistry LOE analysis for determining the likelihood of benthic community impairment. Furthermore, there is ample site specific data to evaluate the potential effects of on tributyltin (TBT) on benthic community health. A site specific Lowest Apparent Effects Threshold ("LAET") chemical threshold value for TBT described in DTR Section 32 was derived and applied at Site stations with only chemistry data to identify areas where benthic community impairment is likely. In addition the use of other chemicals as a surrogate for TBT is further supported by reference to the chemical correlation coefficients for TBT described in Table 29-4. TBT exhibits a particularly strong positive correlation with copper, HPAH, and total PCB as indicated by their correlation coefficients of 0.89, 0.80 and 0.79 respectively which are among the highest correlations observed at the Shipyard Sediment Site. These strong positive correlations indicate that decisions on the likelihood of benthic community impairment based on SQGQ1 values will address areas of the Site with elevated TBT values.

Table 18-2 Individual Station Characteristics and Summary Statistics for Physical Properties (%) and Metals (mg/kg) in the Reference Pool

Station	% Fines	%TOC	Ag	As	Cd	Cr	Cu	Hg	Ni	Pb	Zn
CP 2231	41.2	1.0	0.288	7.78	0.025	46.6	71.1	0.364	11.5	40.3	129
CP 2238	69.0	1.0	0.510	7.8	0.133	59.2	71.0	0.262	16.5	28.8	214
CP 2243	30.3	0.6	0.651	5.94	0.143	40.2	56.4	0.332	10.2	30.7	125
CP 2433	38.4	0.5	0.385	5.55	0.288	42.2	43.3	0.251	11.2	23.3	115
CP 2441	82.8	1.8	0.388	8.82	0.411	54.0	78.4	0.238	17.5	26.7	143
SY 2231	45.0	1.3	0.260	8.3	0.100	37.0	82.0	0.430	10.0	42.0	120
SY 2243	28.0	0.5	0.560	4.3	0.120	23.0	47.0	0.250	5.6	21.0	93.0
SY 2433	41.0	0.7	0.390	4.6	0.290	24.0	40.0	0.210	7.4	19.0	92.0
SY 2441	41.0	1.1	0.240	5.4	0.290	22.0	37.0	0.160	9.9	13.0	80.0
2235	45.0	0.6	0.476	6.4	0.095	37.5	58.2	0.239	10.7	21.3	136
2241	18.0	0.5	0.538	4.53	0.088	27.5	59.2	0.213	7.3	26.3	104
2242	31.0	0.7	0.493	4.27	0.096	25.4	42.0	0.300	6.8	17.8	89.8
2243	35.0	0.5	0.504	3.66	0.101	20.8	38.8	0.239	5.1	19.9	81.2
2256	67.0	1.3	1.29	7.47	0.200	54.3	128	0.632	14.3	54.1	197
2257	77.0	1.6	1.25	9.08	0.175	66.7	157	0.511	18.7	64.1	233
2258	71.0	1.4	0.954	7.75	0.161	60.0	143	0.664	16.4	53.0	211
2260	27.0	0.5	0.452	4.06	0.092	23.9	50.8	0.216	7.1	20.4	87.5
2265	13.0	0.4	0.192	2.48	0.069		18.0	0.065	1.5	12.0	43.2
N	18	18	18	18	18	18	18	18	18	18	18
Minimum	13.0	0.4	0.192	2.48	0.025	20.8	18.0	0.065	1.5	12	43.2
Maximum	82.8	1.8	1.29	9.08	0.411	66.7	157	0.664	18.7	64.1	233
Mean	44.5	0.9	0.546	6.01	0.160	39.1	67.8	0.310	10.4	29.6	127.4
Std Dev	20.5	0.4	0.315	1.98	0.100	15.4	38.3	0.158	4.7	15.0	53.4

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Station	% Fines	%TOC	Ag	As	Cd	Cr	Cu	Hg	Ni	Pb	Zn
RSD	46.1%	49.6%	57.8%	33.0%	62.5%	39.4%	56.4%	50.9%	45.5%	50.6%	41.9%
ERM	NA	NA	3.7	70	9.6	370	270	0.71	51.6	218	410

SCCWRP and U.S. Navy, 2005b

Economic feasibility was assessed by ranking the ~~66~~ ~~65~~ shipyard sediment stations based on ~~according to~~ the contaminant levels for the five primary COCs found in surficial sediment samples. ~~This process used Triad data and site-specific median effects quotient (SS-MEQ).~~²⁵ A series of cumulative cost scenarios was then evaluated by starting with the six most contaminated stations, then adding the six next most contaminated stations, progressing sequentially down the list until the entire Shipyard Sediment Site was included in the scenario (see Appendix for Section 31). For each scenario, the required dredging volume and associated cost of remediation for the set of Thiessen polygons²⁶ included in the step was estimated. The estimated post-remedial surface-area weighted average concentrations (SWAC) and exposure reduction for the primary COCs was also estimated for each cost scenario. Exposure reduction was defined for this purpose as the reduction in sediment SWAC for the shipyard site, relative to background, where the pre-remedial SWAC is considered zero reduction and background is considered 100 percent reduction. As chemical concentrations are reduced and mass removed, the SWAC for each COC decreases, which is equivalent to an expected exposure reduction for the target receptors. The following equation represents the relationship of exposure reduction to post-remedy SWAC.

$$\text{Exposure Reduction} = \text{SWAC}_{\text{current}} - \text{SWAC}_{\text{post-remedy}}$$

To estimate the relative exposure reduction of a cost scenario, it is appropriate to normalize the exposure reduction to background. For example, current conditions represent 0 percent exposure reduction, whereas as post-remedial SWAC equal to background represents 100 percent exposure reduction. This equation is the calculation of the percent of exposure reduction relative to background.

$$\% \text{ Exposure Reduction} = \frac{\text{SWAC}_{\text{current}} - \text{SWAC}_{\text{post-remedy}}}{\text{SWAC}_{\text{current}} - \text{Background}} \times 100$$

Subscript "final" changed to "post-remedy"

The following equation is an example of quantifying exposure reduction. This example assumes a current SWAC of 10 ppm for COC1 and a final SWAC of 2 ppm. The background concentration used in this example is 1 ppm for COC1.

$$\frac{10 \text{ ppm} - 2 \text{ ppm}}{10 \text{ ppm} - 1 \text{ ppm}} \times 100 = 89\%$$

In this example, the exposure reduction relative to background when cleaning up a current SWAC of 10 ppm to a post-remedial SWAC of 2 ppm is 89 percent. An average exposure reduction for each cost scenario was calculated by averaging the percent exposure reduction for each primary COC (copper, mercury, HPAHs, PCBs, and TBT; see Appendix for Section 31).

²⁵ ~~The ranking methodology is discussed in Section 32.2.3. The development and application of the SS-MEQ values is discussed in Section 32.5.2.~~

²⁶ To calculate surface-area weighted average concentrations for COCs at the Shipyard Sediment Site, a geospatial technique (Thiessen polygons) was used to represent the area represented by each sediment sample. This methodology is discussed in Section 32.2.

32. Finding 32: Alternative Cleanup Levels

Finding 32 of CAO No. R9-2011-0001 states:

Under State Water Board Resolution No. 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*, the San Diego Water Board may prescribe alternative cleanup levels less stringent than background sediment chemistry concentrations if attainment of background concentrations is technologically or economically infeasible. Resolution No. 92-49 requires that alternative levels must result in the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on these waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. ~~be set at the lowest levels the discharger demonstrates and the San Diego Water Board finds is technologically and economically achievable.~~ Resolution No. 92-49 further requires that any alternative cleanup level shall: (1) be consistent with maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial uses of such water; and (3) not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.

The San Diego Water Board is prescribing the alternative cleanup levels for sediment summarized in the table below to protect aquatic life, aquatic-dependent wildlife, and human health based beneficial uses consistent with the requirements of Resolution No. 92-49. Compliance with alternative cleanup levels will be determined using the monitoring protocols summarized in Finding 34 and described in detail of Section 34 of the Technical Report.

Alternative Cleanup Levels: Shipyard Sediment Site

Aquatic Life	Aquatic Dependent Wildlife and Human Health	
Remediate all areas determined to have sediment pollutant levels likely to adversely affect the health of the benthic community.	Surface Weighted Average Concentrations (site-wide)	
	Copper	159 mg/kg
	Mercury	0.68 mg/kg
	HPAHs ¹	2,451 µg/kg
	PCBs ²	194 µg/kg
	Tributyltin	110 µg/kg

1. HPAHs = sum of 10 PAHs: Fluoranthene, Pyrene, Benzo[a]anthracene, Chrysene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo(a)pyrene, indeno[1,2,3-c,d]pyrene, Dibenz[a,h]anthracene, and Benzo[g,h,i]perylene.
2. PCBs = sum of 41 congeners: 18, 28, 37, 44, 49, 52, 66, 70, 74, 77, 81, 87, 99, 101, 105, 110, 114, 118, 119, 123, 126, 128, 138, 149, 151, 153, 156, 157, 158, 167, 168, 169, 170, 177, 180, 183, 187, 189, 194, 201, and 206.

In approving alternative cleanup levels less stringent than background the San Diego Water Board has considered the factors contained in Resolution No. 92-49 and the California Code of Regulations, Title 23, section 2550.4, subdivision (d):

Using this ranking approach, the highest ranked polygons were sequentially considered for inclusion into the remedial footprint.

Protectiveness of the beneficial uses represented by aquatic-dependent wildlife and human health was assessed via estimation of post-remedial SWAC values of the remedial footprint. Post-remedial SWAC calculations were completed with the assumption that the SWAC inside the footprint would be remediated to background concentrations derived in Section 29 of this Technical Report. In reality, the SWAC within the footprint may be less than background levels; however, background concentrations were assumed to incorporate conservatism in the analysis. Protectiveness was evaluated in terms of degree of exposure reduction and comparison to aquatic-dependent wildlife and human health risk assessments (Sections 32.3 and 32.4, respectively). The predicted post-remedial SWACs are shown in Table 32-3.

Table 32-3 Post-Remedial SWACs for the Shipyard Sediment Site

Primary Contaminant of Concern	Post-Remedial SWACs (site-wide)
Copper	159 mg/kg
Mercury	0.68 mg/kg
HPAHs	2,451 µg/kg
PCBs	194 µg/kg
TBT	110 µg/kg

Note: See Appendix for Section 32 for supporting calculations.

32.3 Alternative Cleanup Levels Protect Aquatic-Dependent Wildlife Beneficial Uses

An assessment of risk to wildlife receptors under projected post-remedial conditions was conducted to confirm that ~~the chemicals identified as wildlife risk drivers in Section 24 the alternative cleanup levels established by economic analysis (Section 31)~~ are adequately protective of aquatic-dependent wildlife beneficial uses. ~~Based on the Tier II risk assessment results, ingestion of prey items caught within all four assessment units at the Shipyard Sediment Site poses an increased risk above reference to all wildlife receptors other than (excluding the sea lion). The chemicals in prey tissue posing a risk include BAP (surrogate for HPAHs), PCBs, copper, lead, mercury, and zinc. Based on the post-remedial risk assessment results detailed below, post-remedial SWACs for all chemicals identified as wildlife risk drivers are protective of aquatic-dependent wildlife beneficial uses. Six aquatic-dependent wildlife receptors were originally selected in the aquatic-dependent wildlife risk assessment (Sections 22 through 24) to evaluate the protection of beneficial uses. The species include: California least tern (*Sterna antillarum brownie*), California brown pelican (*Pelecanus occidentalis californicus*), Western grebe (*Aechmophorus occidentalis*), Surf scoter (*Melanitta perspicillata*), California sea lion (*Zalophus californianus*), and East Pacific green turtle (*Cheloniemydas agassizii*). No unacceptable risks to sea lion were found for any COC under pre-remedial conditions, therefore this receptor was excluded from the post remedial risk evaluation. Potential risk to green turtle was only identified for lead. Lead was not selected as a primary COC, and no alternative~~

~~cleanup level for lead is proposed. However, the proposed remedy will reduce lead levels in surface sediments due to co-occurrence with primary COCs (see Section 29), resulting in mitigation of exposure and risk to wildlife receptors. The proposed remedy is assumed to be protective for lead, as well as the primary COCs, therefore evaluation of post remedial risk from lead is included here along with the primary COCs.~~

32.7.1. Technological and Economical Feasibility

In prescribing any alternative cleanup levels less stringent than background the San Diego Water Board must consider setting the alternative cleanup levels at the lowest levels that are technologically and economically feasible. This consideration is mandated by Resolution No. 92-49 which directs the San Diego Water Board to apply section 2550.4 of Title 23 of the California Code of Regulations to the extent feasible. Pursuant to Resolution No. 92-49, the San Diego Water Board may not set alternative cleanup levels for chemicals of concern more stringent than “the lowest concentration that the discharger demonstrates and the San Diego Water Board finds is technologically and economically achievable.”¹⁹—This regulation establishes a “ceiling” for proposed concentration limits for chemicals of concern in cleanup and abatement actions.

As demonstrated in Section 31 above, it is not economically feasible to remediate the Shipyard Sediment Site to background sediment-quality levels. Comparing incremental costs of remediation to incremental exposure reduction values, the highest net benefit per remedial dollar spent occurs for the first ~~\$2433~~ million (1~~28~~ polygons), based on the fact that initial exposure reduction is ~~above 12~~between 16 and 13 percent per \$10 million spent. Beyond ~~\$2433~~ million, however, exposure reduction drops consistently as the cost of remediation increases. ~~Exposure reduction drops below 7 percent per \$10 million spent after \$33 million, below 4 percent after \$45 million, and drops to zero at \$185 million~~

Based on this comparison of incremental costs versus incremental benefit, the San Diego Water Board cannot require remediation to background sediment-quality levels because doing so would establish alternative cleanup levels that are not economically feasible and, therefore, are above the “ceiling” permitted by section 2550.4(e).

The total cost of the cleanup is estimated to be \$58 million (see Appendix for Section 32).²⁰ The \$58 million estimated cost of the remedial footprint cannot be directly overlaid on the cost scenarios shown in Figure 31-1 because of the differences in methods and assumptions between the economic feasibility analysis and the alternative cleanup levels/remedial footprint analysis. The \$58 million estimated cost of cleaning up 23 polygons, however, is likely beyond the initial high exposure reduction per cost scenario represented by cleaning up 12 polygons. Cleaning up additional areas beyond the proposed remedial footprint would yield about 4 percent additional exposure reduction per \$10 million spent. Accordingly, the alternative cleanup levels established for the Shipyard Sediment Site are the lowest levels that are technologically and economically achievable, consistent with as required under section 2550.4(e).

32.7.2. Maximum Benefit to the People of the State

Resolution No. 92-49 requires that an alternative cleanup level be consistent with maximum benefit to the people of the State of California. When considering an alternative cleanup level

¹⁹ ~~—See Title 23 CCR section 2550.4(e).~~

²⁰ The actual cost of cleanup can vary significantly from the estimate due to a number of factors including variability regarding the estimated volume, and dredging subcontractor, transportation, and disposal costs.

under Resolution No. 92-49, a regional water board must consider: “all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic

Sediments are resuspended not only from the dredge bucket, but also by other mechanisms associated with dredging such as spillage, prop wash, and anchor systems. Chemical release can occur when bed sediments are suspended in the water column and increased turbidity can itself degrade acceptable levels of habitat quality for organisms in the water column. Re-deposition may occur near the dredge area or, depending on the environmental conditions and controls, resuspended sediment may be transported to other locations in the water body. Further, sediment dredging activities are planned such that a sufficient volume of contaminated sediment is removed; however, removing all particles of contaminated sediment is neither practical nor feasible.

Sediment monitoring will occur in footprint polygons and will be implemented immediately after the dredging contractor has confirmed that dredge depths within the footprint area have been achieved. Dredge depths are confirmed using multibeam dual frequency sonar coupled to differential Global Positioning System (dGPS) equipment. Confirmation sediment sampling will consist of core sediment sample collection in each footprint polygon. Sediment concentrations in a horizon that represents the first undisturbed depth beneath the dredge depth will be measured. This will be determined based on the accuracy to which the dredge operator can guarantee the depth to which they dredge. Samples will be collected from beneath this elevation using appropriate sampling techniques. Sample cores will be just deep enough to collect sufficient sample for analysis. COCs that will be monitored and compared to background sediment chemistry levels include PCBs, copper, HPAHs, TBT, and mercury. The background sediment chemistry levels can be found in Section 29, Table 29-1.

With respect to determining sediment remediation success, there will be natural variability in the sediment chemistry data collected, which does not represent a true difference from the expected value. Natural variability can be attributed to random error in laboratory instrument outputs, sample collection and handling techniques, grain size distribution variance in sediment samples, or other random non-systematic differences that cannot be measured or specifically accounted for. Furthermore, sediment cannot be dredged at depths of 10 centimeters or less. Therefore, dredging success will be evaluated based on the following decision rules applied to subsurface monitored sediment:

- ~~If the concentration of any primary COC in subsurface sediments (deeper than the upper 5 cm) is above 120 percent of the post-remedial dredge area background sediment concentration²² after completion of initial dredging, then additional sediments shall be dredged and the polygon resampled. by performing an additional "pass" with the equipment. If concentrations of COCs in subsurface sediments (deeper than the upper 10 cm) are above 120 percent of background sediment chemistry levels,²² then additional sediments will be dredged by performing an additional "pass" with the equipment.~~
- If concentrations of COCs in subsurface sediments are below 120 percent of background concentrations, then dredging is sufficient and will stop. A sand cover ~~covercap~~ will be placed on the sediment surface, if necessary.

²² See Table 29-1 for background concentrations of COCs.

REVISIONS TO:

C. Proposed Final Environmental Impact Report

The rest of this section is comprised of the pages of the Proposed Final EIR that were revised by the Cleanup Team. The pages are presented in the order of their page numbers with revisions shown in underline and strikeout format.

plate and between edges of the barge and unloading dock to prevent any drippings from falling into San Diego Bay. Upon completion of unloading a material barge, the spill plate shall be cleaned as necessary so that any dried sediment is not discharged or released to the atmosphere. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) shall be responsible for ensuring adherence to the requirements of this measure.

Mitigation Measure 4.2.6: During dredging activities, the contractor shall ensure that the environmental clamshell bucket is entirely closed when withdrawn from the barge and moved to the truck. In addition, the contractor shall ensure that the bucket is completely empty of sediment prior to being moved back to the barge to minimize sediment being spilled over the dock. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) shall be responsible for ensuring adherence to the requirements of this measure.

Mitigation Measure 4.2.7: During final design of the clean sand covers, the sand layer thickness and distribution shall be designed to stabilize the contaminated sediments being covered, control the resuspension and redistribution of existing contaminated sediments, and control ~~prevent~~ substantial perturbation (mixing and overturning) of underlying contaminated sediments, ~~erosion (e.g., propeller wash), and the upward chemical migration into the clean sand covers.~~ The clean sand cover design may be limited to fill from the placement of clean sand. The clean sand cover design shall be thick enough to physically isolate the sediments from benthic or epigenetic organisms to prevent the uptake of bioaccumulative contaminants (e.g.i.e., polychlorinated biphenyls [PCBs]) by aquatic organisms either directly from the sediments or by foraging on benthos. ~~The physical isolation component of the clean sand covers may include separate sub-components for isolation, bioturbation, and consolidation.~~ The clean sand covers shall be designed to be thick enough to stabilize the contaminated sediments being covered and minimize the potential for ~~prevent~~ them to be ~~from being~~ resuspended, eroded, or otherwise ~~and~~ transported away from beneath the under pier areas off site. ~~In addition, the clean sand covers shall be designed to be resistant to erosion, including propeller wash, flow, and tidal-induced erosion.~~ The final engineering plans shall include the source and type of

sand required for subaqueous application of the clean sand covers. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) shall review and have approval authority for the final engineering plans, and shall verify implementation. A regulatory oversight contractor may be used by the San Diego Water Board.

Mitigation Measure 4.2.8: During application of the clean sand covers, the contractor shall place the initial layers of the clean sand cover in controlled thin-lifts so as to ensure proper placement over the required area, minimize the potential for disturbance and intermixing of the underlying sediments, and ensure that the required sand cover thicknesses are achieved. ~~by hydraulically placing the material from a barge in order~~ The sand shall be placed in such a manner as to reduce the vertical impact and lateral spreading of the clean sand cover material and the potential for resuspending the contaminated surface sediments. Controlled placement shall also minimize the mixing of the clean sand covers and underlying sediment by allowing the sediment to slowly gain strength before subsequent layers are deposited. Operational controls such as silt curtains shall also be employed during placement of the clean sand covers. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), with the assistance of a regulatory oversight contractor, shall be responsible for ensuring adherence to the requirements of this measure.

Mitigation Measure 4.2.9: Prior to dredging operations, a Dredging Management Plan (DMP) shall be prepared. The contractor shall implement the measures listed in the DMP during dredging operations. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) shall be responsible for review and approval of the DMP. The DMP shall contain Standard Operating Procedures (SOPs) for the project to assist the dredge contractor in preventing accidental spills and providing the necessary guidelines to follow in case of an oil or fuel spill. In addition to providing SOPs to prevent accidental oil/fuel spills during construction activities, the DMP shall address the identification of dredging needs, a methodology and process for determining dredging priorities and scheduling, the feasibility and requirements for expedited permitting, Quality Assurance Project Plan (QAPP) to comply with regulatory requirements, alternatives for control and operation

launched or repaired. An assortment of waste has been generated at the facility, including spent abrasive, paint, rust, petroleum products, marine growth, sanitary waste, and general refuse. The business has historically been ship repair and maintenance for the United States Navy and commercial customers.

Sediment Quality. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) compared sediment chemistry levels found at the Shipyard Sediment Site to various sediment quality guidelines (SQGs) as well as background reference sediment chemistry levels found in other parts of present-day San Diego Bay. The purpose of this comparison was to evaluate: (1) whether sediment chemistry levels at the Shipyard Sediment Site exceeded background conditions in San Diego Bay; and (2) the potential threat to aquatic life from chemical pollutants detected in the marine sediment (San Diego Water Board, 2011).

The health risk assessment for the Tentative CAO determined that the chemicals posing theoretical increased cancer risks include inorganic arsenic and polychlorinated biphenyls (PCBs). The chemicals posing theoretical increased noncancer risks include cadmium, copper, mercury, and PCBs. Potential risk is also recognized to aquatic dependent wildlife from benzo(a)pyrene (a polynuclear aromatic hydrocarbon [PAH]), PCBs, copper, lead, mercury, and zinc. The types of adverse effects to wildlife are contaminant and species specific, and can range from lethality to sublethal effects such as poor growth, reduced reproduction, developmental effects (e.g., embryo lethality or malformations), and behavioral effects (e.g., nest attentiveness and mating behaviors in birds and predator avoidance by fish).

Contaminants of Concern. Primary contaminants of concern (COCs) were defined by the San Diego Water Board as COCs meeting the following criteria:

- Greatest exceedance of background, suggesting a strong association with the Shipyard Sediment Site;
- Highest magnitude of potential risk at the Shipyard Sediment Site; and
- Higher potential for exposure reduction via remediation.

Secondary COCs were defined as COCs meeting the following criteria:

- Lower concentrations relative to background, suggesting a lower degree of association with the Shipyard Sediment Site; and
- Highly correlated with primary COCs and would be addressed in a common remedial footprint.

4.5.2.1 Federal Regulations

Federal Endangered Species Act. The Federal Endangered Species Act (FESA) of 1973 sets forth a two-tiered classification scheme based on the biological health of a species. Endangered species are those in danger of becoming extinct throughout all or a significant portion of their range. Threatened species are those likely to become endangered in the foreseeable future; Special Rules under Section 4(d) can be made to address threatened species. Ultimately, FESA attempts to bring populations of listed species to healthy levels so that they no longer need special protection. The NMFS and U.S. FWS share responsibility for implementing FESA. Generally, U.S. FWS manages land and freshwater species, while NMFS manages marine and anadromous species. NMFS has jurisdiction over approximately 60 threatened or endangered species and 42 species of concern. U.S. FWS has jurisdiction over the remaining listed species and species of concern.

If a federal action exists and the project may impact listed species or designated critical habitat, consultation with the U.S. FWS and/or NMFS is required through section 7 of FESA. By law, section 7 consultation is a cooperative effort involving affected parties engaged in analyzing the effects posed by proposed actions on listed species or critical habitats. FESA prohibits the “take” of listed species by anyone unless authorized by the U.S. FWS or NMFS. Take is defined as “conduct which attempts or results in the killing, harming, or harassing of a listed species.” Harm is defined as “any act which actually kills or injures fish or wildlife, and emphasizes that such acts may include significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering.” Harassment is defined as an “intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, including breeding, feeding, or sheltering.” Therefore, in order to comply with FESA, any proposed project should be assessed prior to construction to determine whether the project will impact listed species or, in the case of a federal action on the project, designated critical habitats.

Section 7 of FESA directs all federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with the U.S. FWS, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Section 7 applies to management of federal lands as well as other federal actions that may affect listed species, such as federal approval of private activities through the issuance of federal permits, licenses, or other actions.

Section 7(a)(2) of FESA requires all federal agencies, in consultation with and with the assistance of the Secretary of the Interior, to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat. This includes any federal action including funding, licensing, permitting,

responsible agency or agency having jurisdiction over natural resources affected by a project, or the authority of the lead agency, to approve, condition, or deny projects as provided by this division or any other provision of law.

7.2 MITIGATION MONITORING PROCEDURES

The Mitigation Monitoring and Reporting Program (MMRP) has been prepared in compliance with California Environmental Quality Act (CEQA) PRC section 21081.6. It describes the requirements and procedures to be followed by the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) to ensure that all mitigation measures adopted as part of the proposed project will be carried out as described in this Program EIR (PEIR). It is anticipated that a subsequent discretionary approval(s) will be required to fully comply with the directives of the Project. Subsequent discretionary approvals will include, at a minimum, a specific Remedial Action Plan requiring a Clean Water Act permit. To the extent it can be demonstrated to the San Diego Water Board on the basis of substantial evidence that alternative mitigation measures to those set forth herein are equally or more effective at mitigating the identified potentially significant adverse environmental impacts and at protecting the environment, those mitigation measures may be adopted in lieu of those set forth herein at the time subsequent discretionary approvals are granted.

Table 7-1 lists each of the mitigation measures specified in this PEIR and identifies the party or parties responsible for implementation and monitoring of each measure.

Table 7-1: Mitigation and Monitoring Reporting Program

<p>Mitigation Measure 4.2.7:</p>	<p>During final design of the clean sand covers, the sand layer thickness <u>and distribution</u> shall <u>be</u> designed to <u>stabilize the contaminated sediments being covered, control the resuspension and redistribution of existing contaminated sediments, and control prevent</u> substantial perturbation (mixing and overturning) of underlying contaminated sediments, erosion (e.g., propeller wash), and the upward chemical migration into the clean sand covers. <u>The clean sand cover design may be limited to fill from the placement of clean sand.</u> The clean sand cover design shall <u>be thick enough to</u> physically isolate the sediments from benthic or epigenetic organisms to prevent the uptake of bioaccumulative contaminants (e.g., i.e., polychlorinated biphenyls [PCBs]) by aquatic organisms either directly from the sediments or by foraging on benthos. The physical isolation component of the clean sand covers may include separate sub-components for isolation, bioturbation, and consolidation. The clean sand covers shall be designed to <u>be thick enough to</u> stabilize the contaminated sediments being covered and <u>minimize the potential for prevent them to be from being</u> resuspended, <u>eroded, or otherwise and</u> transported <u>away from beneath the under pier areas off site.</u> In addition, the clean sand covers shall be designed to be resistant to erosion, including propeller wash, flow, and tidal induced erosion. The final engineering plans shall include the source and type of sand required for subaqueous application of the clean sand covers. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) shall review and have approval authority for the final engineering plans, and shall verify implementation. A regulatory oversight contractor may be used by the San Diego Water Board.</p>	<p>San Diego Water Board</p>	<p>Ongoing during application of clean sand cover</p>
<p>Mitigation Measure 4.2.8:</p>	<p>During application of the clean sand covers, the contractor shall place the initial layers of the clean sand cover in <u>controlled thin-lifts so as to ensure proper placement over the required area, minimize the potential for disturbance and intermixing of the underlying sediments, and ensure that the required sand cover thicknesses are achieved.</u> by hydraulically placing the material from a barge in order. <u>The sand shall be placed in such a manner</u> to reduce the vertical impact and lateral spreading of the clean sand cover material and the potential for resuspending the contaminated surface sediments. Controlled placement shall also minimize the mixing of the clean sand covers and underlying sediment by allowing the sediment to</p>	<p>Contractor, as verified by the San Diego Water Board</p>	<p>Ongoing during application of clean sand cover</p>

Table 7-1: Mitigation and Monitoring Reporting Program

<p>slowly gain strength before subsequent layers are deposited. Operational controls such as silt curtains shall also be employed during placement of the clean sand covers. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), with the assistance of a regulatory oversight contractor, shall be responsible for ensuring adherence to the requirements of this measure.</p>		
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REVISIONS TO:

D. Tentative Resolution No. R9-2011-0072 Certifying the Final Environmental Impact Report for the Shipyard Sediment Remediation Project, San Diego Bay, California

The rest of this section is comprised of the pages of Tentative Resolution No. R9-2011-0072 that were revised by the Cleanup Team. The pages are presented in the order of their page numbers with revisions shown in underline and strikeout format.

Mitigation Measure 4.2.7: During final design of the clean sand covers, the sand layer thickness and distribution shall be designed to stabilize the contaminated sediments being covered, control the resuspension and redistribution of existing contaminated sediments and control ~~prevent~~ substantial perturbation (mixing and overturning) of underlying contaminated sediments, ~~erosion (e.g., propeller wash), and the upward chemical migration into the clean sand covers.~~ The clean sand cover design may be limited to fill from the placement of clean sand. The clean sand cover design shall be thick enough to physically isolate the sediments from benthic or epigenetic organisms to prevent the uptake of bioaccumulative contaminants (e.g.i.e., polychlorinated biphenyls [PCBs]) by aquatic organisms either directly from the sediments or by foraging on benthos. ~~The physical isolation component of the clean sand covers may include separate sub-components for isolation, bioturbation, and consolidation.~~ The clean sand covers shall be designed to be thick enough to stabilize the contaminated sediments being covered and minimize the potential for prevent them to be from being resuspended, eroded, or otherwise and transported away from beneath under pier areas off site. ~~In addition, the clean sand covers shall be designed to be resistant to erosion, including propeller wash, flow, and tidal-induced erosion.~~ The final engineering plans shall include the source and type of sand required for subaqueous application of the clean sand covers. The San Diego Water Board shall review and have approval authority for the final engineering plans, and shall verify implementation. A regulatory oversight contractor may be used by the San Diego Water Board.

Mitigation Measure 4.2.8: During application of the clean sand covers, the contractor shall place the initial layers of the clean sand cover in controlled thin lifts so as to ensure proper placement over the required area, minimize the potential for disturbance and intermixing of the underlying sediments, and ensure that the required sand cover thicknesses are achieved. ~~by hydraulically placing the material from a barge in order~~ The sand shall be placed in such a manner as to reduce the vertical impact and lateral spreading of the clean sand cover material and the potential for resuspending the contaminated surface sediments. Controlled placement shall also minimize the mixing of the clean sand covers and underlying sediment by allowing the sediment to slowly gain strength before subsequent layers are deposited. Operational controls such as silt curtains shall also be employed during placement of the clean sand covers. The San Diego Water Board, with the assistance of a regulatory oversight contractor, shall be responsible for ensuring adherence to the requirements of this measure.

Mitigation Measure 4.2.9: Prior to dredging operations, a Dredging

dredging and application of the clean sand covers, the contractor shall conduct water quality monitoring to demonstrate that implementation of the remedial activities does not result in violations of water quality objectives in the Basin Plan outside of the construction area. The contractor shall submit weekly water quality reports to the San Diego Water Board. If water quality objectives are violated, the San Diego Water Board may temporarily halt activity and impose additional required measures to protect water quality.

Mitigation Measure 4.2.5: Prior to initiation of dredging activities, the contractor shall determine the swing radius of the unloading equipment and shall place a steel plate (swing tray or spill plate) between the material barge and the hard cape to prevent spillage from falling directly into the water. The steel plate shall be sufficiently large enough to cover the swing radius of the unloading equipment. The spill plate shall be designed to prevent any “drippings” from falling between the material barge and dock where the unloading equipment is stationed. The spill plate shall be positioned so that any “dripped” material/water either runs back into the material barge or onto the unloading dock, which shall be lined with an impermeable material and beamed to contain excess sediment/water. The steel plate shall be designed to prevent any water or sediment from re-entering San Diego Bay. As a secondary containment measure, filter fabric material shall be placed over the spill plate and between edges of the barge and unloading dock to prevent any drippings from falling into San Diego Bay. Upon completion of unloading a material barge, the spill plate shall be thoroughly rinsed so that excess sediment is drained into the material barge or onto the unloading dock (depending on spill plate positioning) and then placed on the lined dock until the next unloading sequence. The San Diego Water Board shall be responsible for ensuring adherence to the requirements of this measure.

Mitigation Measure 4.2.6: During dredging activities, the contractor shall ensure that the environmental clamshell bucket is entirely closed when withdrawn from the barge and moved to the truck. In addition, the contractor shall ensure that the bucket is completely empty of sediment prior to being moved back to the barge to minimize sediment being spilled over the dock. The San Diego Water Board shall be responsible for ensuring adherence to the requirements of this measure.

Mitigation Measure 4.2.7: During final design of the clean sand covers, the sand layer thickness and distribution shall be designed to stabilize the contaminated sediments being covered, control the resuspension and redistribution of existing contaminated sediments, and control prevent substantial perturbation (mixing and overturning) of

underlying contaminated sediments, ~~erosion (e.g., propeller wash), and the upward chemical migration into the clean sand covers. The clean sand cover design may be limited to fill from the placement of clean sand.~~ The clean sand cover design shall be thick enough to physically isolate the sediments from benthic or epigenetic organisms to prevent the uptake of bioaccumulative contaminants (e.g.i.e., polychlorinated biphenyls [PCBs]) by aquatic organisms either directly from the sediments or by foraging on benthos. ~~The physical isolation component of the clean sand covers may include separate sub-components for isolation, bioturbation, and consolidation.~~ The clean sand covers shall be designed to be thick enough to stabilize the contaminated sediments being covered and minimize the potential for prevent them to be from being resuspended, eroded, or otherwise and transported away from beneath the under pier areas off site. ~~In addition, the clean sand covers shall be designed to be resistant to erosion, including propeller wash, flow, and tidal-induced erosion.~~ The final engineering plans shall include the source and type of sand required for subaqueous application of the clean sand covers. The San Diego Water Board shall review and have approval authority for the final engineering plans, and shall verify implementation. A regulatory oversight contractor may be used by the San Diego Water Board.

Mitigation Measure 4.2.8: During application of the clean sand covers, the contractor shall place the initial layers of the clean sand cover in controlled thin lifts so as to ensure proper placement over the required area, minimize the potential for disturbance and intermixing of the underlying sediments, and ensure that the required sand cover thicknesses are achieved.~~by hydraulically placing the material from a barge in order~~ The sand shall be placed in such a manner as to reduce the vertical impact and lateral spreading of the clean sand cover material and the potential for resuspending the contaminated surface sediments. Controlled placement shall also minimize the mixing of the clean sand covers and underlying sediment by allowing the sediment to slowly gain strength before subsequent layers are deposited. Operational controls such as silt curtains shall also be employed during placement of the clean sand covers. The San Diego Water Board, with the assistance of a regulatory oversight contractor, shall be responsible for ensuring adherence to the requirements of this measure.

Mitigation Measure 4.2.9: Prior to dredging operations, a Dredging Management Plan (DMP) shall be prepared. The contractor shall implement the measures listed in the DMP during dredging operations. The San Diego Water Board shall be responsible for review and approval of the DMP. The DMP shall contain Standard Operating Procedures (SOPs) for the Project to assist the dredge contractor in

Mitigation Monitoring and Reporting Program (MMRP)

Mitigation Measures	Responsible Party	Timing for Mitigation Measure
<p>environmental clamshell bucket is entirely closed when withdrawn from the barge and moved to the truck. In addition, the contractor shall ensure that the bucket is completely empty of sediment prior to being moved back to the barge to minimize sediment being spilled over the dock. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) shall be responsible for ensuring adherence to the requirements of this measure.</p>	<p>by the San Diego Water Board</p>	<p>dredging operations</p>
<p>Mitigation Measure 4.2.7: During final design of the clean sand covers, the sand layer thickness <u>and distribution</u> shall be designed to <u>stabilize the contaminated sediments being covered, control the resuspension and redistribution of existing contaminated sediments, and control prevent</u> substantial perturbation (mixing and overturning) of underlying contaminated sediments, erosion (e.g., propeller wash), and the upward chemical migration into the clean sand covers. <u>The clean sand cover design may be limited to fill from the placement of clean sand.</u> The clean sand cover design shall <u>be thick enough to</u> physically isolate the sediments from benthic or epigenetic organisms to prevent the uptake of bioaccumulative contaminants (<u>e.g., i.e.,</u> polychlorinated biphenyls [PCBs]) by aquatic organisms either directly from the sediments or by foraging on benthos. The physical isolation component of the clean sand covers may include separate sub-components for isolation, bioturbation, and consolidation. The clean sand covers shall be designed to <u>be thick enough to</u> stabilize the contaminated sediments being covered and <u>minimize the potential for prevent them to be from being</u> resuspended, eroded, or otherwise and transported <u>away from beneath the under pier areas off site.</u> In addition, the clean sand covers shall be designed to be resistant to erosion, including propeller wash, flow, and tidal induced erosion. The final engineering plans shall include the source and type of sand required for subaqueous application of the clean sand covers. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) shall review and have approval authority for the final engineering plans, and shall verify implementation. A regulatory oversight contractor may be used by the San Diego Water Board.</p>	<p>San Diego Water Board</p>	<p>Ongoing during application of clean sand cover</p>
<p>Mitigation Measure 4.2.8: During application of the clean sand covers, the contractor shall place the initial layers of the clean sand cover in controlled lifts <u>so as to ensure proper placement over the required area, minimize the potential for</u></p>	<p>Contractor, as verified by the San Diego Water Board</p>	<p>Ongoing during application of clean sand cover</p>

Mitigation Monitoring and Reporting Program (MMRP)

Mitigation Measures	Responsible Party	Timing for Mitigation Measure
<p><u>disturbance and intermixing of the underlying sediments, and ensure that the required sand cover thicknesses are achieved. by hydraulically placing the material from a barge in order. The sand shall be placed in such a manner as</u> to reduce the vertical impact and lateral spreading of the clean sand cover material and the potential for resuspending the contaminated surface sediments. Controlled placement shall also minimize the mixing of the clean sand covers and underlying sediment by allowing the sediment to slowly gain strength before subsequent layers are deposited. Operational controls such as silt curtains shall also be employed during placement of the clean sand covers. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), with the assistance of a regulatory oversight contractor, shall be responsible for ensuring adherence to the requirements of this measure.</p>		
<p>Mitigation Measure 4.2.9: Prior to dredging operations, a Dredging Management Plan (DMP) shall be prepared. The contractor shall implement the measures listed in the DMP during dredging operations. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) shall be responsible for review and approval of the DMP. The DMP shall contain Standard Operating Procedures (SOPs) for the project to assist the dredge contractor in preventing accidental spills and providing the necessary guidelines to follow in case of an oil or fuel spill. In addition to providing SOPs to prevent accidental oil/fuel spills during construction activities, the DMP shall address the identification of dredging needs, a methodology and process for determining dredging priorities and scheduling, the feasibility and requirements for expedited permitting, Quality Assurance Project Plan (QAPP) to comply with regulatory requirements, alternatives for control and operation of dredging equipment, and Best Management Practices (BMPs) to implement in the event of equipment failure and/or repair. Typical BMPs for equipment failure or repair shall be identified in the DMP and could include: communication to project personnel, proper signage and/or barriers alerting others of potentially unsafe conditions, all repair work to be conducted on land and not over water, repair work involving use of liquids to be performed with proper spill containment equipment (e.g., spill kit), and a contingency plan identifying availability of other equipment or subcontracting options. Furthermore, the DMP shall specify that water discharges to San Diego Bay are prohibited; therefore, the barge shall</p>	<p>Contractor, as verified by the San Diego Water Board</p>	<p>Prior to initiation of and ongoing during dredging operations</p>