

TECHNICAL SPECIFICATIONS SAN DIEGO SHIPYARD SEDIMENT SITE – SOUTH SHIPYARD

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CERTIFICATION PAGE

The engineering material and data contained in these Contract Documents were prepared under the supervision and direction of the undersigned, whose seal as a registered professional engineer is affixed below:



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Senior Managing Engineer

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Section 011000 – Summary of Work

PART 1 – GENERAL

1.01 SCOPE

- A. The accompanying Contract Drawings and Technical Specifications show and describe the location and type of work to be performed for the project.
1. The San Diego Bay Restoration Fund – South Trust (South Trust; known as the Owner) requires contaminated sediments to be remediated within the San Diego Shipyard Sediment Site (Site), which is divided into the North and South Shipyards and located in San Diego Bay, San Diego, California.
 2. The Owner will designate a representative (Engineer) to advise, coordinate, and monitor the Work on behalf of the Owner.
 3. The Contractor shall provide all labor and furnish and/or install all materials and equipment, as may be required to complete the Work as installed, as tested for full operation and use, and as described in the Contract Documents.
 4. The Work required for the project as shown on the Contract Drawings and described in the Technical Specifications includes, but is not limited to:
 - a) Supporting the Owner and Engineer with development of the Final Design.
 - b) Preparing the Sediment Management Area (SMA) to perform sediment offloading, handling, and offhauling to an approved disposal facility.
 - c) Installing a landside pipeline to replace the existing underwater salt water fire main pipeline shown on the Contract Drawings. The replacement pipeline shall be installed and connected prior to removal of the existing pipeline.
 - d) Demolishing, removing, and disposing of timber pier structure and debris specifically identified on the Contract Drawings.
 - e) Dredging, dewatering, and transporting via haul barge approximately 52,600 cubic yards (cy) of sediments to the SMA, as shown on the Contract Drawings.
 - f) Transporting and disposing of 52,600 cy of sediments to an approved disposal facility.

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- g) Screening, stockpiling, and removing dredging debris as encountered during construction activities.
 - h) Providing water management and continuous treatment of dredge water and other water related to construction activities.
 - i) Placing approximately 7,000 square yards (sy) of sand cover material in various underpier and open-water restricted dredging locations, as shown on the Contract Drawings.
 - j) Placing approximately 8,300 sy of gravelly sand material over various slopes in restricted dredging locations, as shown on the Contract Drawings.
5. Contingency work for the project as shown in the Contract Drawings and described in the Technical Specifications includes:
- a) Additional dredging of sediments based on confirmational sampling if results indicate more removal is necessary at the location and the Engineer specifies additional dredging as opposed to additional placement of sand cover. The amount of additional dredging is unknown, but for the purposes of bid preparation, is estimated to be 6,000 cy.
 - b) Additional transport and disposal of dredged material as a result of confirmational sampling.
 - c) Additional placement of sand cover material based on confirmational sampling if results indicate that additional material is necessary and the Engineer specifies additional sand cover placement as opposed to additional dredging. The amount of clean sand cover is unknown, but for the purposes of bid preparation, is estimated to be 4,500 sy.
6. In-water work shall occur during limited environmental construction windows, and all work shall comply with project permit requirements. See Section 014126 – Permits.
- B. To the extent reasonable, the Technical Specifications are written in the imperative. Stated actions are used to indicate mandatory contract requirements on the part of the Contractor.

1.02 LOCATION

- A. The Site is located on the eastern shore of central San Diego Bay, approximately 0.5 mile south of the Coronado Bridge. The Site is also commonly referred to as

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General Dynamics NASSCO, 2798 East Harbor Drive, San Diego, California
92113.

1.03 ACCESS TO THE SITE

- A. The Contractor shall have access to the work area via the water from San Diego Bay and via land from the SMA.

1.04 WORK PERFORMED UNDER SEPARATE CONTRACTS

- A. None.

1.05 WORK BY OTHERS ON THE PROJECT

- A. The Owner or Engineer, Project Marine Biologist, or Project Biologist (as the Owner's Representative) will perform, at a minimum, the following tasks:
 - 1. Conduct water quality monitoring using a combination of automated water quality sensors and manual water sample collection.
 - 2. Perform testing of project-generated water prior to discharging in accordance with permit requirements.
 - 3. Collect Paint Filter Liquid Tests prior to the Contractor offhauling the sediment.
 - 4. Conduct pre- and post-construction eelgrass surveys.

1.06 PRE-ORDERED MATERIALS

- A. None.

1.07 EXISTING MATERIALS

- A. None.

1.08 ENGINEERING AND INSPECTION

- A. The engineers, inspectors, and consultants of the Owner will perform the necessary inspection work, except as otherwise specified in the Contract Documents. Refer to Section 014500 – Quality Control.
- B. Representatives of the regulatory agencies and the Owner shall be allowed on the work area and on Contractor equipment to inspect the Work at any time.

1.09 COORDINATION

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- A. The San Diego Bay Restoration Fund –North Trust (North Trust) is conducting a separate cleanup of contaminated sediments as part of the project. The North Shipyard (also commonly referred to as BAE Systems San Diego Ship Repair) is located immediately to the north of the South Shipyard, within San Diego Bay, as shown on the Contract Drawings. The Contractor shall coordinate site construction activities as necessary with the North Trust contractor to minimize disruptions and interference between the two projects.
- B. The Site is an active shipyard. The Contractor shall avoid interference with any ongoing shipyard activities and commerce, and shall coordinate marine activity and vessel movements with the Owner, National Steel and Shipbuilding Company (NASSCO), San Diego Unified Port District, Harbormaster, and U.S. Coast Guard.
- C. All costs associated with coordination of the Work shall be considered incidental to the Contract lump sum and unit prices set forth in the Bid Proposal.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

DIVISION 01—GENERAL REQUIREMENTS

Section 011400 - Work Restrictions

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section describes the uses and restrictions for the premises work hours, and sequencing of activities.

1.02 USE OF PREMISES

- A. The Contractor shall limit use of premises to work in areas indicated on the Contract Drawings as permitted for Contractor operations and designated access routes. The Contractor shall not disturb portions of the San Diego Shipyard Sediment Site (Site), beyond areas in which the Work is indicated. Disturbance outside the designated Sediment Management Area (SMA) or Dredging Limits (as shown on the Contract Drawings) is not allowed and Contractor may be subject to penalty if disturbance occurs.
 - 1. Limits: Confine construction operations to limits as shown on the Contract Drawings.
 - 2. Owner Occupancy: Allow for Owner and Engineer access to the work area, but public access shall be prohibited.
 - 3. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to the Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a) Schedule deliveries to minimize the use of driveways and entrances.
 - b) Schedule deliveries to minimize space and time requirements or the storage of materials and equipment on site.
 - 4. Move any stored products under the Contractor's control that interfere with the Owner's or the South Shipyard's operations or access to adjacent properties.
 - 5. Site Security Procedures: The Contractor shall work directly with the appropriate representative of the South Trust (Michael Chee at 619-544-7778) to ensure full compliance with all security access requirement at the Site. This shall apply to the Contractor as well as all subcontractors, vendors, etc., associated with the construction.
- B. The Contractor shall observe all offsets shown on the Contract Drawings including, but not limited to:

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Section 011400 - Work Restrictions

1. Offset from seawall at shoreline of SMA.
2. Offsets from marine structures.
3. Offsets from eelgrass beds.
4. Site utilities.

Surround on-shore protected areas with highly visible fencing prior to the start of Work.

1.03 RESTORATION CLAUSE

- A. The Contractor shall restore all areas disturbed during the construction process. All ingress or egress points that are disturbed shall be regraded, and/or repaved to restore them to conditions existing prior to the start of construction or better.
- B. Unless otherwise designated, the Contractor shall protect all existing site features to remain from potential Contractor damage above and below grade. If unavoidable damage occurs, notify the Owner immediately and a decision will be rendered as to how the Contractor is to replace or repair the damage at the Contractor's expense.

1.04 NEW AND EXISTING WORK

- A. Unless otherwise noted, any new work authorized by the Owner shall be assumed to be performed in conditions corresponding to existing conditions and shall utilize similar material, workmanship, grade, and finish. Work replaced shall match similar existing work. Areas damaged during this Contract shall be restored to the condition at time of award of Contract, or replaced with new work as determined by the Owner.

1.05 WORK SCHEDULE/HOURS

- A. No in-water work shall occur outside of the in-water construction window of September 17, 2013, through March 31, 2014.
- B. Vessel movement at the Site shall be restricted from September 13 to 17, 2013, to accommodate previously planned water quality sampling at the Site.
- C. The Site will be accessible to the Contractor 24 hours per day, 7 days per week for activities within the active shipyard. Gate 2 located near the entrance to the SMA is manned by Shipyard Security Monday through Friday from 5 AM to 5 PM. The Contractor shall make arrangements for payment of security with NASSCO the Owner if needed for work or vehicle ingress/egress conducted outside of the Shipyard Security hours. The fully burdened rate for security outside of Shipyard Security hours is \$50/hour.

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Section 011400 - Work Restrictions

- D. The Contractor shall prohibit truck haul activity between the hours of 7 pm and 7 am or on Sundays and holidays and during Shipyard personnel shift changes (Monday through Friday from 3:00 to 3:15 PM and 12:30 to 12:45 AM).
- E. The Contractor shall submit a schedule of working hours to the Owner for acceptance prior to the start of any work at the Site. Do not perform any activities outside of these hours without prior approval of the Owner. Said approval shall be requested no later than 48 hours prior to the proposed work outside of these hours.

1.06 PERMIT RESTRICTIONS AND REGULATORY REQUIREMENTS

- A. The Contractor shall comply with all conditions in approved permits found in Appendix A and subsequently obtained by the Owner and Contractor. See Sections 014126 – Permits and 014500 – Quality Control.

1.07 SEQUENCING

- A. Coordination with Shipyard Activities and Traffic.
 - 1. Shipyard activities, drydock usage, berth and pier usage, vessel traffic, and site operational procedures shall be accommodated by the Contractor and all subcontractors throughout construction. Coordination between the Contractor and shipyard personnel shall be required throughout operations, to make sure shipyard procedures are not disturbed by Contractor Work.
- B. Coordination with Ongoing Shipyard Construction Work.
 - 1. It is anticipated that other construction projects may be underway during the progress of the Work. If other projects occur, they will be brought to the Contractor's attention by the Owner in advance. The Contractor shall ensure that their work is scheduled, sequenced, and coordinated in such a way as to avoid any interference with these ongoing construction activities.
- C. Sequence of Work.
 - 1. As part of the Contractor Remedial Action Work Plan (RAWP), which will be submitted in accordance with the requirements of Section 014000, the Contractor shall provide a Work Schedule for Site operations to be approved by the Owner and Engineer. Any adjustments to the approved Work Schedule shall be communicated to the Owner and Engineer as they are realized. Generally, the operations at the Site shall proceed according to the following sequence:

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Section 011400 - Work Restrictions

- a) Mobilization of equipment, materials and labor necessary to perform the Work to the Site.
- b) Preparation and set-up of Site temporary facilities and SMA.
- c) Installation of landside pipeline to replace the existing underwater salt water fire main pipeline.
- d) Demolition of existing structures and removal of identified debris targets.
- e) Mechanical dredging of sediment as shown on the Contract Drawings and concurrent sediment offloading, processing, transport and disposal of the sediment.
- f) Post-dredge surveying and sampling.
- g) Additional dredging or sand cover placement operations as directed by the Engineer.
- h) Placement of underpier and open-water cover placement.
- i) Restoration of the Site to pre-construction conditions.
- j) Verification of project completion by the Engineer and Owner.
- k) Demobilization of equipment, materials and labor from the Site.

D. In-Water Work Restriction Schedule.

1. Vessel movement at the Site shall be restricted from September 13 to 17, 2013, to accommodate pre-scheduled water quality sampling by the South Shipyard.
2. In-water work in the vicinity of the drydock shall be prohibited until the currently docked vessel, *USS ESSEX*, is undocked and approval to proceed is obtained from the Owner. Undocking is currently scheduled for October 22, 2014, and is subject to change.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

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Section 011400 - Work Restrictions

END OF SECTION

DIVISION 01—GENERAL REQUIREMENTS

Section 013529 – Health, Safety, and Emergency Response Procedures

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section includes the requirements for health and safety provisions necessary for the Work at the San Diego Shipyard Sediment Site (Site).
- B. The Work includes compliance with all laws, regulations, and ordinances with respect to safety, noise, dust, fire and police action, civil disobedience, security, and traffic.

1.02 SUBMITTALS

- A. The San Diego Bay Restoration Fund – South Trust (South Trust; known as the Owner) and Engineer in consultation with National Steel and Shipbuilding Company (NASSCO) will develop a site-specific draft Health and Safety Plan (HASP) prior to construction, as described in Section 013300 – Submittal Procedures. The draft HASP will be reviewed by and modified to accommodate the Contractor’s proposed Remedial Action Plan. The Contractor will develop its own HASP for its activities including, at a minimum, the provisions and requirements set forth in the draft HASP developed by the Owner and Engineer as well as the Mitigation Monitoring and Reporting Program (MMRP) SCH No. 2009111098.
- B. The site-specific HASP shall meet all requirements of federal, state, and local laws, rules, and regulations and the pertinent regulations listed in Technical Specifications. The HASP shall address all requirements for general health and safety and shall include but not be limited to:
 - 1. Description of the Work to be performed and anticipated chemical and/or physical hazards associated with the Work.
 - 2. Map of the Site illustrating the location of anticipated hazards and areas of control for those hazards.
 - 3. Hazardous material inventory and Material Safety Data Sheets (MSDSs) for all chemicals that will be brought onto the Site.
 - 4. Appropriate signage to warn work area personnel and visitors of anticipated site hazards.
 - 5. Engineering controls/equipment to be used to protect against anticipated hazards.
 - 6. Personal protective equipment and clothing including head, foot, skin, eye, and respiratory protection.

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7. Work area housekeeping procedures and personal hygiene practices.
8. Personnel and equipment decontamination plan.
9. Administrative controls.
10. Emergency plan, including locations of and route to nearest hospital.
11. Record keeping, including:
 - a) Documentation of appropriate employee certification and training including:
 - 1) Training for operators to prevent spillage of sediment during dredging activities.
 - 2) Training for operators in decontamination and waste containment procedures.
 - 3) Training for operators in appropriate notification/handling procedures for munitions/ordnance.
12. Name and qualification of the designated Site Safety and Health Officer to be on site at all times throughout construction activities.
13. Signatory page for work area personnel to acknowledge receipt, understanding, and agreement to comply with the HASP.

1.03 POTENTIAL PHYSICAL AND OTHER HAZARDS

- A. The Work of the Contractor is described elsewhere in the Technical Specifications. Precautions to prevent all anticipated physical and other hazards, including heavy equipment and vessels, shall be addressed in the Contractor's HASP and included as pertinent in the draft HASP developed by the Owner and Engineer.
- B. Specific aspects of construction resulting in physical hazards anticipated for this project include, but are not limited to, the following:
 1. Work over water, presenting hazards of falling overboard and drowning.
 2. Operation of marine equipment, including winches, derricks, and related equipment that present hazards of entrapment, ensnarement, and being struck by moving parts.
 3. Operation of land-based construction equipment and vehicular traffic at the Site.

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- C. Other anticipated physical hazards include, but are not limited to, the following:
 - 1. Heat stress, such as that potentially caused by impermeable clothing (may reduce the cooling ability of the body due to evaporation reduction).
 - 2. Cold stress, such as that potentially caused during times of low temperatures and high winds, especially when precipitation occurs during these conditions.
 - 3. Biological hazards, such as insect stings or bites.
 - 4. Trips and falls.

PART 2 – PRODUCTS

2.01 PRODUCTS SPECIFIED FOR HEALTH AND SAFETY

- A. The Contractor shall provide the equipment and supplies necessary to support the work as described in its site-specific HASP. Equipment and supplies may include, but are not limited to, the following:
 - 1. Chemicals to be used on site, including dust suppressors/wetting agents, cleaning degreasing, and/or welding/cutting supplies.
 - 2. Hazardous materials inventory and MSDSs for chemicals brought on site.
 - 3. Fencing and barriers.
 - 4. Warning signs and labels.
 - 5. Fire extinguishers.
 - 6. Equipment to support “hot” work.
 - 7. Equipment to support “lock out/tag out” procedures.
 - 8. Personal protective equipment (hard hats, steel-toed boots, and skin, eye, and respiratory protection).
 - 9. Area and personnel exposure monitoring equipment.
 - 10. Demolition equipment and supplies.
 - 11. Decontamination equipment and supplies.
 - 12. First aid equipment.
 - 13. Release prevention equipment.

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Section 013529 – Health, Safety, and Emergency Response Procedures

14. Field documentation logs/supplies.

PART 3 – EXECUTION

3.01 WORK AREA PREPARATION

- A. The Contractor shall comply with health and safety rules; regulations and ordinances of the federal, state, and local government; various project permits; the MMRP; and the Contract Documents. Such compliance shall include, but is not be specifically limited to, the following:
 1. Any and all protective devices, equipment, and clothing.
 2. Guards.
 3. Restraints.
 4. Locks.
 5. Latches.
 6. Switches.
 7. Other safety provisions that may be required or necessitated by state and federal safety regulations.
- B. The Contractor shall determine the specific requirements for safety provisions and provide inspections and reports by the appropriate safety authorities to be conducted to ensure compliance with the intent of the regulations.
- C. The Contractor shall inform employees and subcontractors and their employees of the potential danger of working with any potentially contaminated materials and equipment at the Site.
- D. The Contractor shall inform the Owner and Engineer and any other entities on site of potential dangers of the Contractor's work activities.
- E. The Contractor shall perform whatever work is necessary for safety and be solely and completely responsible for conditions of the work area, including safety of all persons (including the Contractor, subcontractor, and Owner personnel) and all visitors to the Site) and property during the Contract period. This requirement applies continuously and is not limited to active working hours.
- F. The Owner's review of the Contractor's performance does not include an opinion regarding the adequacy of or approval of the Contractor's Safety and Health Officer, safety program, or any safety measures taken in, on, or near the Site.

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Section 013529 – Health, Safety, and Emergency Response Procedures

- G. Accidents causing death, injuries, or damage must be immediately reported in person or by telephone to the Owner and NASSCO. In addition, the Contractor shall promptly report in writing to the Owner and NASSCO all accidents arising out of, or in connection with, the performance of the Work whether on, or adjacent to, the Site, giving full details and statements of witnesses.
- H. If a claim is made against the Contractor or any subcontractor because of any accident, the Contractor shall promptly report the facts in writing within 24 hours after occurrence to the Owner and NASSCO, giving full details of the claim.

3.02 SITE SAFETY AND HEALTH OFFICER

- A. The Contractor must provide a person designated as the Site Safety and Health Officer, who is thoroughly trained in construction safety, marine construction safety, rescue procedures, and the use of all necessary safety equipment, air monitoring equipment, and gas detectors that the work requires. The person must be present at all times while active work operations are being performed and must conduct testing as necessary.
- B. The Site Safety and Health Officer shall be empowered with the delegated authority to order any person or worker at the Site to follow the safety rules. Failure to observe these rules is sufficient cause for removal of the person or worker(s) from this project.
- C. The Site Safety and Health Officer is responsible for determining the extent to which any safety equipment must be used, depending on conditions encountered at the Site.

END OF SECTION

DIVISION 01—GENERAL REQUIREMENTS

Section 014000 – Remedial Action Work Plan

PART 1 – GENERAL

1.01 SCOPE

- A. This Section provides, in conjunction with other referenced sections, general requirements for the Contractor's Remedial Action Work Plan (RAWP). The RAWP refers to a set of plans to be submitted by the Contractor prior to the start of Work at the San Diego Shipyard Sediment Site (Site). The RAWP provides detailed and specific designs, procedures, methods, and layouts for accomplishment of the Work as specified and delineated in the Contract Documents, the Cleanup and Abatement Order (CAO), Technical Report, Final Environmental Impact Report, Mitigation and Monitoring Reporting Program, and Remedial Action Plan as well as other permits or approvals issued by any regulatory agency with jurisdiction over the implementation of the CAO.
- B. The final approved RAWP documents shall supplement the Contract Drawings and Technical Specifications during execution of the Work. All Work shall be conducted in accordance with the Contract Drawings, Technical Specifications, CAO, Technical Report, Final Environmental Impact Report, Mitigation and Monitoring Reporting Program, Remedial Action Plan, other permits or approvals issued by any regulatory agency with jurisdiction over the implementation of the CAO, and the final Approved RAWP. The RAWP is intended to ensure that Site remediation meets all required cleanup levels, while being accomplished by means that are protective of worker safety and health, the public, and the environment. The RAWP shall demonstrate to the Engineer, San Diego Bay Restoration Fund – South Trust (South Trust; known as the Owner), and reviewing governmental agencies that the Contractor is well prepared and capable of completing the site remediation on schedule and in accordance with the Contract. The RAWP requires approval by the Engineer, Owner, and U.S. Army Corps of Engineers.
- C. The RAWP shall cover all portions of the Work described in the Technical Specifications.

1.02 REFERENCE STANDARDS

- A. The publications listed below apply to the Work specified in this Section to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.
 - 1. Code of Federal Regulations (CFR).
 - a) 33 CFR 81: 72 COLREGS (International Regulations for Preventing Collision at Sea -1972): Implementing Rules.

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Section 014000 – Remedial Action Work Plan

- b) 33 CFR 84: Annex 1: Positioning and Technical Details of Lights and Shapes.
 - c) 33 CFR 85: Annex II: Additional Signal for Fishing Vessels in Close Proximity.
 - d) 33 CFR 86: Annex III: Technical Details of Sound Signal Appliances.
 - e) 33 CFR 89: Inland Navigation Rules: Implementing Rules.
2. U.S. Coast Guard (USCG).
- a) M16672.2(1999): Navigation Rules Instruction Manual.

1.03 SUBMITTALS

- A. The Contractor shall prepare and submit a draft RAWP for review and approval. The RAWP shall consist of the individual plans listed below in Item 1.06 of this Section. The Contractor shall review all sections of the Contract for complete RAWP document requirements and content. The RAWP shall be approved by the Engineer and Owner before the Contractor may commence field work. The Engineer may allow the Contractor to begin limited or conditional work based on approval of individual sections of the RAWP.

1.04 SUBMITTAL SCHEDULE

- A. Project Approach Memorandum.
 - 1. Submit Project Approach Memorandum with Bid.
 - 2. The Project Approach Memorandum shall provide a general approach to how the Contractor intends to implement the remedial action and shall contain in bulleted form the list of required elements in RAWP.
- B. Draft RAWP.
 - 1. A subset of the plans provided in the RAWP will be developed in coordination with the Owner and Engineer, as designated in Section 013300 – Submittal Procedures. These plans will be provided to the Contractor for inclusion in the RAWP. The plans prepared by the Owner and Engineer shall be reviewed by the Contractor, modified to accommodate the Contractor's proposed construction plan, and accepted by the Contractor for inclusion in the RAWP and implementation during the Work.
 - 2. Submit to the Engineer within 14 calendar days of Contract Award.

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Section 014000 – Remedial Action Work Plan

3. The Contractor shall submit to the Engineer written response to the draft RAWP review comments within 2 working days following the receipt of the comments. A draft RAWP review conference shall then be held within 2 calendar days after receipt of the Contractor's written responses, if deemed necessary by the Engineer. The purpose of the review conference will be to resolve any remaining comments on the RAWP document and to reach agreement on the scope of required revisions and modifications to be incorporated in the revised draft RAWP. The Engineer will notify the Contractor of the date and time of the conference.
4. Submit revised RAWP to the Engineer within 7 calendar days of receipt of Engineer's comments.

1.05 PRE-CONSTRUCTION MEETING

- A. The RAWP shall be reviewed at Pre-Construction Meeting detailed in Section 013100 – Project Management and Coordination. The following personnel shall be present to review the RAWP:
 1. Engineer and any Owner representatives and subcontractors.
 2. Contractor's Project Manager.
 3. Contractor's Site Superintendent or Site Manager.
 4. The following personnel shall attend the RAWP review at the Pre-Construction Meeting if requested by the Engineer:
 - a) Contractor's Quality Control Supervisor.
 - b) Contractor's Health and Safety Manager.
 - c) Representative of any subcontractor with significant involvement in implementation of the RAWP.

1.06 REMEDIAL ACTION WORK PLAN

- A. The RAWP shall describe the proposed methods for the Contractor's execution of the remedial action. In accordance with the specifications, the Contractor will submit several plans to support the construction. These plans collectively will form the Contractor's RAWP and will include descriptions of the specific means, methods, disposal facilities, schedule, and personnel.
- B. The RAWP shall include, but not be limited to, the following:
 1. Health and Safety Plan.

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Section 014000 – Remedial Action Work Plan

~~2. Project Work Plan.~~

~~3. 2. Project Schedule.~~

~~4. 3. Demolition Plan.~~

~~5. 4. Survey Plan.~~

~~6. 5. Vessel Management Plan.~~

~~7. 6. Dredging and Offloading Work Plan.~~

~~8. 7. Sediment Management Plan.~~

~~9. 8. Hazardous Materials Transportation Plan.~~

~~10. 9. Traffic Control Plan.~~

~~11. 10. Water Management and Treatment Plan.~~

~~12. 11. Cover Material Placement Plan.~~

~~13. 12. Construction Quality Control Plan.~~

~~14. 13. Environmental Protection Plan.~~

~~15. 14. Construction Stormwater Pollution Prevention Plan.~~

~~16. 15. Contingency Plan.~~

~~17. 16. Communication Plan.~~

~~18. 17. Dredging Management Plan.~~

C. Each of the above elements is described below:

1. Health and Safety Plan. The Contractor shall submit a site-specific Health and Safety Plan (HASP) presenting the health and safety requirements for the job site activities, and the measures and procedures to be employed for protection of on-site personnel. The plan will cover the controls, work practices, personal protective equipment (PPE), and other health and safety requirements that will be implemented by the Contractor in connection with the Site construction activities. The HASP shall comply with all provisions of Section 013529 – Health Safety and Emergency Response Procedures.

2. Project Schedule. The Project schedule shall be prepared in accordance with Section 013200 – Construction Progress Documentation. The

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Section 014000 – Remedial Action Work Plan

Schedule provided in the RAWP shall be periodically updated as required in Section 013200 – Construction Progress Documentation.

3. Demolition Plan. The demolition plan shall be prepared in accordance with and implement the requirements of Section 024113 – Demolition.
4. Survey Plan. This section of the RAWP shall be prepared in accordance with and implement the requirements of Section 017123 – Surveying.
5. Vessel Management Plan. This section of the RAWP shall be prepared in accordance with and implement the requirements of Section 352023 – Dredging.
6. Dredging and Offloading Plan. This section of the RAWP shall be prepared in accordance with and implement the requirements of Section 352023 – Dredging.
7. Sediment Management Plan. This section of the RAWP shall be prepared in accordance with and implement the sediment handling, management, transportation and disposal requirements of Section 360000 – Sediment Handling and Management.
8. Hazardous Materials Transportation Plan. This section of the RAWP shall be prepared in accordance with and implement the hazardous waste storage, handling, and transportation requirements of Section 360000 – Sediment Handling and Management.
9. Traffic Control Plan. This section of the RAWP shall be prepared in accordance with and implement the traffic requirements of Section 360000 – Sediment Handling and Management.
10. Water Management and Treatment Plan. This section of the RAWP shall be prepared in accordance with and implement the water management requirements of Section 360000 – Sediment Handling and Management.
11. Material Placement Plan. This section of the RAWP shall be prepared in accordance with and implement the requirements of Section 352026 – Cover Material Placement.
12. Construction Quality Control Plan. This section of the RAWP shall be prepared in accordance with and implement the requirements of Section 014500 – Quality Control.
13. Environmental Protection Plan. This section of the RAWP shall be prepared in accordance with and implement the requirements of Section 015719 – Temporary Environmental Controls.

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Section 014000 – Remedial Action Work Plan

14. Construction Stormwater Pollution Prevention Plan. This section of the RAWP shall be prepared in accordance with and implement the requirements of Section 015719 – Temporary Environmental Controls..
15. Contingency Plan. This section of the RAWP shall be prepared in accordance with and implement the requirements of Section 015719 – Temporary Environmental Controls and Protection.
16. Communication Plan. This section of the RAWP shall be prepared in accordance with and implement the requirements of Section 013100 – Project Management and Coordination.
17. Dredging Management Plan. This section of the RAWP shall be prepared in accordance with and implement the requirements of Section 352023 – Dredging and Section 360000 –Sediment Handling and Management.

PART 2 – PRODUCTS

Not applicable.

PART 3 – EXECUTION

Not applicable.

END OF SECTION

DIVISION 01—GENERAL REQUIREMENTS

Section 014500 – Quality Control

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section describes the Contractor’s quality control (QC) requirements, duties, and responsibilities during execution of the Work. This Section requires the Contractor to establish a necessary level of control that will provide sufficient information to assure both the Contractor and the Engineer that requirements of the Technical Specification are achieved.
- B. The Contractor shall establish, provide, and maintain as part of the Remedial Action Work Plan (RAWP), a Construction Quality Control (CQC) Plan as specified herein, detailing the methods and procedures that will be taken to ensure that all materials and completed construction elements conform to the Contract Drawings, the Technical Specifications, and other requirements. Although guidelines are established and certain minimum requirements are specified herein and elsewhere in the Technical Specifications, the Contractor shall ensure that construction and CQC are accomplished in accordance with the stated purpose and the Technical Specifications as described in this Section.
- C. The Contractor shall be prepared to discuss and present at the Pre-Construction Meeting, its understanding of the CQC requirements. The Contractor shall not begin the Work until the CQC Plan has been reviewed and approved by the Engineer.

1.02 SUBMITTALS

- A. The Contractor shall submit the following:
 - 1. Qualifications of the personnel identified in Paragraph 2.01 of this Section.
 - 2. CQC Plan.
 - 3. Daily Inspection Reports.
 - 4. Test Reports.

1.03 QUALITY ASSURANCE/QUALITY CONTROL OF INSTALLATION

- A. The Contractor shall monitor QC over suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality.
- B. The Contractor shall comply with the manufacturer’s instructions, including each step in sequence. Should the manufacturer’s instructions conflict with the Contract Documents, the Contractor shall request clarification from the Engineer before proceeding.

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Section 014500 – Quality Control

- C. The Contractor shall comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- D. The Contractor shall perform the Work by using persons qualified to produce required and specified quality.
- E. The Contractor shall verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- F. The Contractor shall secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- G. The Contractor shall familiarize itself with pertinent codes and standards. In procuring all items used in the Work, the Contractor shall verify the detailed requirements of the specifically named codes and standards and verify that the items procured for use during the Work meet or exceed the specified requirements.
- H. The San Diego Bay Restoration Fund – South Trust (South Trust; known as the Owner) reserves the right to reject items incorporated into the Work that fail to meet the specified minimum requirements. The Owner further reserves the right, and without prejudice to other recourse the Owner may take, to accept non-complying items subject to an adjustment in the Awarded Contract Price as approved by the Owner.

1.04 REFERENCES AND STANDARDS

- A. The Contractor shall provide products or workmanship specified by association, trade, or other consensus standards that comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. The Contractor shall conform to reference standard by date of issue current on date of the Contract Documents, except where a specific date is established by code.
- C. The Contractor shall obtain copies of standards where required by product specification sections.
- D. Neither the contractual relationships, duties, nor responsibilities of the parties in the Contract nor those of the Owner shall be altered from the Contract Documents by mention or inference otherwise in any reference document.
- E. All pertinent laws, ordinances, rules, regulations, and codes shall govern construction activities at the San Diego Shipyard Sediment Site (Site).

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Section 014500 – Quality Control

F. Construction not governed by governmental regulations or the Technical Specifications will be governed by the more stringent provisions of the latest published edition or statute adopted, at the time of Contract signing, following applicable codes and standards:

1. Uniform Building Code.
2. National Electrical Code.
3. Uniform Plumbing Code.
4. Uniform Fire Code.

1.05 PERMITS

A. All work performed by the Contractor shall be comply with project permits detailed in Section 014126 – Permits.

1.06 TESTING SERVICES

- A. Necessary materials testing shall be performed by an independent testing laboratory during the execution of the Work. The Contractor shall provide access to the area necessary to perform the testing and/or to secure the material for testing.
- B. Testing does not relieve the Contractor from performing the Work to Contract requirements.
- C. Re-testing required because of non-conformance to specified requirements shall be performed by the same independent firm. Required re-testing due to non-conformance with specified requirements shall be performed at no additional cost to the Owner.
- D. Material testing for initial material approval will be performed by an independent, certified laboratory and paid for by the Contractor. These tests must be dated within 6 months of the submittal date.
- E. Subsequent sampling and testing required as the Work progresses to verify continual control of materials and compliance with all requirements of the Contract Documents shall be the responsibility of the Contractor, except as required by other sections of the Technical Specifications.
- F. For chemistry testing in sediment, aggregates, and water, the Owner prefers that testing to be accomplished by Calscience Environmental Laboratories, Inc. in Garden Grove, CA; contact Danielle Gonsman at 714-895-5494. For physical materials testing, the Owner has not selected a specific laboratory, so the Contractor may select a lab provided that it is fully accredited for the required

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Section 014500 – Quality Control

testing methods, and subject to the Owner’s written approval. If the Contractor wishes to propose an alternative chemistry testing laboratory, then the same criteria and need for written approval shall apply.

1.07 MANUFACTURER’S FIELD SERVICES

- A. When specified in the Technical Specifications, the Contractor shall require material or product suppliers or manufacturers to provide qualified staff personnel to observe conditions of surfaces and installation, quality of workmanship, start-up equipment, test, and adjust and balance equipment as applicable and to initiate instructions when necessary.
- B. The Contractor shall submit qualifications of observer to the Owner 30 days in advance of required observations. The observer is subject to approval by the Owner.
- C. The Contractor shall report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to the manufacturer's written instructions.

PART 2 – PRODUCTS

2.01 CONTRACTOR PERSONNEL REQUIREMENTS

- A. All Contractor personnel shall be trained, experienced, and qualified to perform tasks assigned to them.
- B. The Contractor shall submit qualifications of the proposed Field Superintendent to the Owner for review and approval as part of the CQC Plan as detailed in this Section and Section 013300 – Submittals. The proposed Field Superintendent shall have a minimum of 5 years of relevant work experience and have experience as the field superintendent on three projects of similar type and size, as described below.

PART 3 – EXECUTION

3.01 CONSTRUCTION QUALITY CONTROL PLAN

- A. The Contractor shall submit a CQC Plan to the Owner as required in Section 013300 – Submittal Procedures. The CQC Plan will be reviewed by the Owner and must be approved before any work may begin. The CQC Plan will be used to document inspections, monitoring, surveys, and other actions to be taken by the Contractor to ensure that the Work complies with all Contract requirements.
- B. The CQC Plan shall identify personnel, procedures, methods, instructions, records, and forms to be used to control the work and verify that the Work conforms to the Contract documents.

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Section 014500 – Quality Control

- C. The CQC Plan shall include the following elements, at a minimum:
1. Description of the QC organization, including an organizational chart showing the various QC team members, along with their designated responsibilities and lines of authority.
 2. Acknowledgement that the QC staff will conduct inspections for all aspects of the Work specified, and shall report to the QC Supervisor, or someone of higher authority in the Contractor's organization.
 3. The name, qualifications, duties, responsibilities, and authorities of each person assigned a primary QC function.
 4. A summary of the delegated responsibilities of the QC Supervisor, signed by an authorized official of the firm.
 5. Procedures for scheduling and managing submittals, including those of subcontractors, off-site fabricators, and material suppliers.
 6. Testing methods, schedules, and procedures used to report QC information to the Owner, including samples of the various reporting forms.
 7. The project schedule.
 8. Project sequencing.
- D. QC Organization.
1. The Contractor shall identify its on-site QC Supervisor, who shall be responsible for overall QC management and have the authority to act in all QC matters for the Contractor.
 2. Staff shall be maintained under the direction of the QC Supervisor to perform all QC activities. The actual strength of the staff during any specific work period may vary to cover shift needs and rates of performance. The staff shall be fully qualified by experience and technical training to perform its assigned responsibilities and shall be directly hired for the Work by the Contractor.
- E. The Contractor is encouraged to add any additional elements to the CQC Plan deemed necessary to adequately control all production and/or construction processes required by this Contract.

3.02 DOCUMENTATION

- A. Specific Contractor QC records required for the Contract shall include, but are not necessarily limited to, the:

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Section 014500 – Quality Control

1. Quality Control Records are those documents that have been reviewed and accepted by the Contractor as complete, correct, and legible. Quality Control Records shall include the following:
 - a) Contract Drawings, Technical Specifications, procedures used for construction, procurement documents, inspections and test records.
 - b) Submittals.
 - c) Personnel and procedure qualification records.
 - d) Material, chemical, and physical property test results.
 - e) Certificates of compliance and shipment releases.
 - f) Non-compliance reports and corrective action.

All Quality Control Records shall be identified in the CQC Plan and maintained on site in the Contractor's files. The Engineer shall be provided access to these files when requested. Upon the completion of Work at the Site as approved by the Owner, these files shall be turned over to the Engineer.

2. The Daily CQC Report shall be attached to the Contractor's Daily Construction Report, submitted in accordance with Section 013300 – Submittals. At a minimum, information in this daily CQC Report shall include the following items:
 - a) Date.
 - b) Weather conditions.
 - c) Period covered by the report.
 - d) Equipment used.
 - e) Staff on site.
 - f) Description of activity as identified by stationing and offset.
 - g) Quantity of material dredged or excavated that day and to date.
 - h) Quantity of material placed that day and to date.
 - i) Downtime and delays to the operation.
 - j) Health and safety status.

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- k) Other relevant comments concerning conduct of the operation.
 3. The Daily CQC Report shall include results of all inspections, surveys, and monitoring activities and shall be signed by the Contractor's Superintendent or CQC Supervisor.
 4. The Daily CQC Report shall be dated and signed by the Contractor's CQC Supervisor and submitted to the Engineer with the Daily Construction Report by 10 AM the following working day after the day's activities being reported.
- B. Document Control.

The CQC Plan shall require Contractor-generated documents pertaining to quality-related items be controlled. The following types of documents shall be on controlled distribution to ensure that changes to them are transmitted and received when applicable:

1. Manuals.
2. Instructions.
3. Procedures.
4. Technical Specifications.
5. Contract Drawings.
6. Inspection and test plans.
7. Field change requests.

3.03 CORRECTIVE ACTION REQUIREMENTS

- A. The CQC Plan shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of compliance with project requirements (out of tolerance) and detail what action will be taken to bring the process into control.

3.04 OVERSIGHT BY THE ENGINEER

- A. All items of material and equipment shall be subject to oversight by the Engineer at the point of production, manufacturer, or shipment to determine if the Contractor, producer, manufacturer, or shipper maintains an adequate QC system in conformance with the requirements detailed herein and the applicable Contract Drawings and Technical Specifications. In addition, all items of materials, equipment, and work in place shall be subject to surveillance by the Engineer at the Site for the same purpose.

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- B. To facilitate oversight by the Engineer, the Contractor shall allow the Engineer access to the dredge derrick, barge, or other floating equipment at the request of the Owner while the Work is being performed.
- C. Oversight by the Engineer does not relieve the Contractor of performing QC inspections of either on-site or off-site Contractor or subcontractor's work.

3.05 NON-COMPLIANCE

- A. The Engineer will notify the Contractor of any non-compliance with any of foregoing requirements. The Contractor shall, after receipt of such notice, immediately take corrective action. Any notice, when delivered by the Engineer or an authorized representative to the Contractor or an authorized representative at the Site, shall be considered sufficient notice.

END OF SECTION

DIVISION 01—GENERAL REQUIREMENTS

Section 015713 – Temporary Erosion and Sediment Control and Construction Stormwater Pollution Prevention

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The Work shall consist of installing, inspecting and maintaining Temporary Erosion and Sediment Control (TESC) best management practices (BMPs) to prevent pollution of air and water and control, respond to, and dispose of eroded sediment and turbid water during the term of the Contract, consistent with project permits and the project-specific Stormwater Pollution Prevention Plan (SWPPP) regulations.
- B. These TESC requirements shall apply to all areas associated with the work including, but not limited to, the following:
 - 1. SMA limits.
 - 2. Stockpile areas.
 - 3. Discharge points within or adjacent to work areas that are impacted by stormwater runoff from the San Diego Shipyard Sediment Site (Site).
- C. The Contractor shall read and conform to all requirements set forth in the National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges Associated with Construction Activities.

1.02 REFERENCES

- A. The rules, requirements, and regulations that apply to the work include, but are not necessarily limited, to the following:
 - 1. Stormwater Quality Handbook, SWPPP/Water Pollution Control Program (WPCP) Preparation Manual. State of California Department of Transportation. June 2011.
 - 2. SWPPP/WPCP Review Guidance Manual. State of California Department of Transportation. December 2003.

1.03 SUBMITTALS

- A. Material Safety Data Sheet (MSDS) for any dust palliative product shall be submitted to the San Diego Bay Restoration Fund – South Trust (South Trust; known as the Owner).
- B. All Contractor site inspection logs and monthly Discharge Monitoring Reports shall be submitted to the Owner monthly.

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Section 015713 – Temporary Erosion and Sediment Control and Construction Stormwater Pollution Prevention

PART 2 – PRODUCTS

2.01 GENERAL

- A. Products required to accomplish or be incorporated into the work of this Section shall be as shown on the Contract Drawings or in the approved SWPPP, or as selected by the Contractor, subject to approval by the Owner.

2.02 DUST CONTROL

- A. Dust palliative for dust control shall be proposed by the Contractor and approved by the Engineer.

PART 3 – EXECUTION

3.01 GENERAL

- A. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply as determined by the Owner.
- B. No water shall be discharged to San Diego Bay.
- C. The Contractor shall be solely responsible for any damages and fines incurred because of the Contractor, subcontractor, or supplier's actions in implementing the requirements of this Section.
- D. The Contractor shall be solely responsible for schedule impacts incurred because of the Contractor, subcontractor, or supplier's actions in implementing the requirements of this Section.

3.02 TEMPORARY EROSION AND SEDIMENT CONTROL IMPLEMENTATION

- A. The Contractor shall implement the SWPPP, including TESC BMPs.
- B. The Contractor shall ensure that water or a dust palliative and a dispensing subcontractor is available as needed. It is the responsibility of the dispensing subcontractor to develop and adhere to appropriate safety measures pertaining to the palliative use.
- C. The Contractor shall establish methods for controlling sediment and erosion that address vegetative practices, structural control, silt fences, straw dikes, sediment controls, and operator controls as indicated in the project permits, as shown on the Contract Drawings, as specified in the SWPPP, or as directed by the Owner.
- D. Wastewater and stormwater management controls.

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Section 015713 – Temporary Erosion and Sediment Control and Construction Stormwater Pollution Prevention

1. Pollution prevention measures.
 - a) Use methods of dewatering, unwatering, excavating, or stockpiling earth and rock materials that include prevention measures to control silting and erosion, and which will intercept and settle any runoff of sediment-laden waters.
 - b) Prevent wastewater from general construction activities, such as drain water collection, aggregate processing, concrete batching, drilling, grouting, or other construction operations, from entering flowing or dry watercourses or saltwater bodies without the use of approved turbidity control methods.
 - c) Divert stormwater runoff from upslope areas away from disturbed areas.

- E. Construction site management.
 1. Contractor construction operations.
 - a) Perform construction activities by methods that will prevent entrance or accidental spillage of solid matter, contaminants, debris, or other pollutants or wastes into adjacent water body or underground water sources. Such pollutants and wastes include, but are not restricted to, refuse, garbage, cement, sanitary waste, industrial waste, hazardous materials, and oil and other petroleum products.

 2. Stockpiled or deposited materials.
 - a) Do not stockpile or deposit dredged material or other construction materials near or on the SMA shoreline where they can in any way encroach upon the adjacent water body.

 3. Fuel storage tanks management.
 - a) Place fuel or other petroleum product (hereinafter referred to collectively as fuel) storage tanks or containers at least 20 feet from shoreline.
 - b) House all fuel in a secondary containment structure.
 - c) Construct storage area dikes at least 12 inches high or graded and sloped to permit safe containment of leaks and spills equal to the capacity located in each area plus a sufficient amount of freeboard to contain the 25-year rainstorm.

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Section 015713 – Temporary Erosion and Sediment Control and Construction Stormwater Pollution Prevention

- d) Provide diked areas with an impermeable barrier at least 50 mils thick. Provide areas used for refueling operations with an impermeable liner at least 50 mils thick buried under 2 to 4 inches of soil.
- F. In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the Work as scheduled or as ordered by the Owner, such work shall be performed by the Contractor at its own expense.
- G. Without limiting the Indemnification provided in Section 007200 - General Conditions, the Contractor agrees to indemnify, defend, and hold the Owner and National Steel and Shipbuilding Company (NASSCO) and their respective parents, affiliated companies, and each of their officers, agents, and employees free and harmless from any and all claims, demands, actions, damages, liabilities, and costs (including, without limitation, reasonable attorneys' fees incurred in defense thereof) related to non-compliance with any permit, order, law, or regulation applicable to the Work that is caused by, related to, arises from, or in any way connected with the Contractor's performance of the Work, with the exception of any claim, demand, action, damage, liability, or cost that results from circumstances beyond the reasonable control of the Contractor.
- H. Prior to final payment, all temporary facilities shall be removed and Construction Stormwater Discharge Permit terminated (as necessary) upon completion of the Work.

END OF SECTION

DIVISION 01—GENERAL REQUIREMENTS

Section 015719 – Temporary Environmental Controls and Protection

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section describes temporary environmental controls and best management practices (BMPs) required for the Contract to prevent environmental pollution and minimize environmental degradation during and as a result of construction operations. The Contractor shall be responsible for adhering to these controls while completing the Work under the Contract.
- B. Other Technical Specifications may also contain specific requirements for environmental protection. Those specific requirements are in addition to or modify the requirements in this Section; the more stringent requirements shall control. The control of environmental pollution requires consideration of noise levels, air, water, and land.
- C. Environmental degradation arising from construction activities shall be prevented, abated, controlled, and minimized by complying with all applicable federal, state, and local laws and regulations concerning environmental pollution control and abatement, as well as the specific requirements in the Section 401 Water Quality Certification (to be acquired) and the Contract Documents. The Contractor shall comply with all permit conditions.

1.02 SUBMITTALS

- A. Environmental Protection Plan.
 - 1. As part of the Remedial Action Work Plan (RAWP), the Contractor shall submit to the San Diego Bay Restoration Fund – South Trust (South Trust; known as the Owner) a detailed, written Environmental Protection Plan (EPP) that presents the procedures by which the Contractor shall establish and maintain quality control (QC) for environmental protection of all items of the remedial action. The EPP shall address all construction activities. The Engineer shall approve the EPP before the Notice to Proceed is given to the Contractor. If the Engineer finds the EPP to be unsatisfactory, it will be returned to the Contractor for resubmission. No physical work at the San Diego Shipyard Sediment Site (Site) shall be started until the EPP has been approved or specific authorization is obtained to start a phase of the Work. The Engineer may require preparation and submittal of supplemental plans if additional environmental protection planning is found necessary for later phases of the Work. At a minimum, the EPP shall contain the following information:
 - a) Contamination Prevention.

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Section 015719 – Temporary Environmental Controls and Protection

- 1) List all potentially hazardous products, such as petroleum and toxic materials on site and corresponding provisions to be taken to prevent accidental introduction of such materials into any water body, the air, or the ground.
 - 2) Provide plans for preventing polluted runoff from equipment parking and maintenance areas from entering local water bodies.
 - 3) Describe methods that will be used to monitor haul barges for leakage during loading and transport of dredged material at the offloading area. If leakage is evidenced, however minor, operations shall be terminated and not restarted until repairs, satisfactory to the Engineer, are made. Any spillage or leaks shall promptly be cleaned up and placed in the prescribed disposal area.
 - 4) Describe methods, procedures, and BMPs to comply with water quality criteria and contingency measures to meet criteria if exceedances occur.
 - 5) Methods to prevent loss of contaminated sediment during dredging, transport, rehandling, dewatering, stockpiling, and disposal activities.
- b) Containment and Cleanup.
- 1) Include procedures, instructions, and reports to be used in the event of an unforeseen incident requiring a containment action, including contingency measures to be implemented if noticeable spillage or sediment loss occurs during handling and transfer of dredged material.

B. Contingency Plan.

1. The Owner and Engineer will develop a site-specific Draft Contingency Plan prior to construction, as described in Section 013300 – Submittal Procedures. The Draft Contingency Plan will be reviewed and modified to accommodate the Contractor's proposed RAWP and accepted by the Contractor for implementation during the Work.
2. The Contingency Plan shall, at a minimum, contain the following:
 - a) Actions to implement in the event of equipment failure or repair:
 - 1) Notify project personnel of failure.

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Section 015719 – Temporary Environmental Controls and Protection

- 2) Place signage and/or barriers alerting others of unsafe conditions.
 - 3) Specify repair work to be conducted on land.
 - 4) Identify proper spill containment equipment.
 - 5) Implement a plan identifying availability of other equipment or options.
- b) Actions to implement in the event of silt curtain breach:
- 1) Notify project personnel of breach.
 - 2) Implement emergency procedures (e.g., work stoppage).
 - 3) Incident reporting and review procedure to evaluate the causes of an accidental silt curtain breach and steps to avoid further breaches.
- c) Response procedures in the event of barge overfill.
- d) Actions to implement in event that munitions or ordnance are encountered:
- 1) Immediate stoppage of all in-water work activities until further notice to proceed.
 - 2) Contact Site Safety and Health Officer.
 - 3) Contact NAVFAC Southwest Division for recovery and disposal of munitions or ordnances found.

PART 2 – PRODUCTS

2.01 FLOATING SILT CURTAIN

- A. A floating silt curtain shall be comprised of connected lengths of Type III geotextile fabric capable of being supported by a floating boom in open-water areas and directly connected to a structure along pier edges.
- B. The bottom of the silt curtain shall be weighted with ballast weights or rods affixed to the base fabric. Where feasible and applicable, the floating silt curtains must be anchored and deployed from the surface of the water to just above the substrate.

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- C. The Contractor shall monitor the silt curtain for damage, dislocations, or gaps and immediately fix any locations where it is no longer continuous or where it has loosened from its supports.

PART 3 – EXECUTION

3.01 IMPLEMENTATION

A. Coordination.

- 1. At the Pre-Construction Meeting, the Engineer and Contractor shall discuss the Contractor's operations to develop mutual understandings relative to the administration of the EPP.

B. Supervision.

- 1. During the Work, all activities, including those of subcontractors, shall be supervised to ensure compliance with the intent and details of the EPP. Compliance by subcontractors with this Section will be the responsibility of the Contractor.
- 2. The Contractor shall conduct weekly environmental compliance meetings for itself and its subcontractors to ensure that all personnel working at the Site are familiar with the environmental protection provisions.
- 3. All equipment and materials for environmental protection shall be inspected weekly to ensure that they are in proper order, being applied correctly, and have not deteriorated. A written inspection report shall be provided as part of the Weekly Report giving the condition of the equipment and materials.

3.02 WATER QUALITY MONITORING

- A. The Owner will perform water quality monitoring, consistent with the Remediation Monitoring Plan (RMP) and the Section 401 Water Quality Certification (to be acquired). The Contractor shall familiarize itself with water quality requirements and with the Owner's monitoring plans and activities, which are available in Appendix C of the Remedial Action Plan.

- 1. The Contractor and Engineer shall monitor water quality throughout in-water operations in accordance with the requirements of the applicable regulatory documents. Permits and associated water quality monitoring requirements will be made available to the Contractor as they are received.
- 2. The Engineer will monitor water quality at regular occasions using a combination of automated water quality sensors and manual water sample

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Section 015719 – Temporary Environmental Controls and Protection

collection. The Contractor shall abide by all Owner-derived direction regarding responding to the results of water quality monitoring.

3. The Contractor shall have in place:
 - a) BMPs to prevent water quality exceedances.
 - b) Contingency measures to implement should water quality exceedances occur.

B. In the event of a water quality exceedance, the Contractor shall modify its procedures, methods, or equipment appropriately to remedy the exceedances, at no additional expense to the Owner. The purpose of the specified water quality monitoring is to provide ongoing assessment of the water quality impacts of dredging and sand cover.

3.03 NOTIFICATION OF NONCOMPLIANCE

- A. The Engineer will notify the Contractor of non-compliance with the provisions of this Section. Immediate corrective action shall be taken. Such notice, delivered at the Site, shall be sufficient for the Contractor to take action.
- B. The Engineer may issue an order stopping all or part of the Work for failure to comply until corrective action has been taken. No time lost resulting from such stop orders shall be the subject of a claim for extension of time or for costs or damages.
- C. The Contractor is required to comply with all environmental requirements whether or not notified by the Engineer of non-compliance.

3.04 PROTECTION OF LAND RESOURCES

- A. Land resources within site boundaries and outside the limits of the Work shall be preserved in their present condition or be restored to their pre-project condition after construction, agreeable to the Engineer.

3.05 PROTECTION OF WATER RESOURCES

- A. The Contractor shall comply with state water quality standards and conditions of any permits and clearances obtained for the Work. No uncontrolled effluent will be permitted that results from the Contractor's construction activities in the waterway or at the Sediment Management Area (SMA).
- B. Environmental controls specific to the SMA, including sediment handling, stormwater management, dredge decant water management, and sediment disposal, are provided in Section 360000 – Sediment Handling and Management.

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Section 015719 – Temporary Environmental Controls and Protection

- C. The following in-water BMPs shall be implemented by the Contractor to avoid and minimize impacts to water quality.
1. The Contractor shall install and maintain a double set of silt curtains to fully surround the dredging equipment and barge being loaded with sediment to ensure against turbidity and water quality monitoring exceedances. The silt curtain shall be anchored and deployed to just above the substrate. The Contractor may use air curtains in conjunction with silt curtains to contain re-suspended sediment, enhance worker safety, and allow barges to transit into and out of the work area without the need to open and close the silt curtains.
 2. A floating boom shall be used around the point of dredging.
 3. Dredge cycle time shall be controlled to reduce potential for sediment to be washed from the bucket.
 4. Multiple dredge bites shall be avoided.
 5. An environmental clamshell bucket shall be used for dredging, and the Contractor shall ensure that the bucket is entirely closed when withdrawn from the water and moved to the barge. If a clamshell bucket is required due to material density, the Contractor will supplement appropriate sequencing and production rates to ensure water quality criteria requirements are maintained.
 6. The digging bucket shall not be overfilled.
 7. Two closure switches shall be installed on each side of the bucket near the top and bottom to provide an electrical signal to the operator that the bucket is closed.
 8. Bottom stockpiling shall be prohibited.
 9. Sweeping or leveling the bottom surface with the dredge bucket shall be prohibited.
 10. Wide pocket haul barges shall be used and shall have watertight containment to prevent return water from re-entering San Diego Bay.
 11. Haul barges shall not be overloaded. The Contractor shall mark each barge to allow the operator to visually identify the maximum load point.
 12. Weirs shall not be used as a means to dewater haul barges. The Contractor shall allow additional room for sediment placement.

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13. Material shall be placed carefully into the haul barges to minimize splashing or sloshing of sediment.
14. Material shall not pile up on the debris grate during debris separation.
15. Barge movement and work boat speeds shall be restricted in the dredge area to minimize sediment resuspension.
16. Dredging vertically or laterally beyond the Dredging Limits established on the Contract Drawings shall be avoided to the maximum extent possible to minimize resuspension to the water column.
17. Cover material shall be placed in a manner that minimizes resuspension of sediments.

3.06 PROTECTION OF FISH AND WILDLIFE

- A. The Work shall be performed and all steps taken to prevent interference or disturbance to fish and wildlife.
- B. Habitat outside site boundaries that is critical to fish or wildlife shall not be altered or disturbed.
- C. The Contractor shall mark eelgrass beds at the direction of the Project Marine Biologist and shall avoid eelgrass beds and possible sea turtles, as shown on the Contract Drawings.
- D. Eelgrass beds shall not be disturbed by in-water operations, including but not limited to, anchoring, grounding, and propeller damage.
- E. The Contractor and appropriate employees and subcontractors shall meet with the Project Marine Biologist and Engineer prior to commencing dredging to review the location of the eelgrass beds and proper construction techniques to implement near the eelgrass beds. A training log will be maintained by the Project Marine Biologist.
- F. The Contractor shall not injure or harass sea turtles and marine mammals during implementation of in-water operations.
- G. The Contractor shall brief the construction crew and vessel operators daily on the potential for sea turtles and marine mammals and provide identification characteristics of sea turtles, seals, sea lions, and dolphin. These briefings will be periodically confirmed by the Project Marine Biologist.
- H. All in-water work shall be stopped if a sea turtle or marine mammal is sighted within 100 meters of the construction zone until the sea turtle or marine mammal is safely outside of the perimeter.

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Section 015719 – Temporary Environmental Controls and Protection

- I. The Contractor shall stop work at the direction of the Project Biologist in the event an imminent threat to California least tern and/or other special-status species occurs.
- J. The Contractor shall immediately cease in-water operations if fish kill or distressed fish are observed and immediately notify the Engineer and appropriate permitting agencies.

3.07 MAINTENANCE OR POLLUTION CONTROL FACILITIES

- A. The Contractor shall maintain all constructed facilities and portable pollution control devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

END OF SECTION

DIVISION 01—GENERAL REQUIREMENTS
Section 017000 – Execution and Closeout Requirements

PART 1 – GENERAL

1.01 RELATED WORK DESCRIBED ELSEWHERE

- A. The provisions and intent of the Contract, including the Procurement and Contracting Requirements and General Requirements, apply to the Work as specified in this Section. Work related to this Section is described throughout the Technical Specifications.

1.02 TIMING

- A. The Contractor shall ensure that the Work is complete in all aspects prior to requesting final inspection.

PART 2 – PRODUCTS

2.01 WARRANTY

- A. The Contractor warrants the labor, materials, and equipment delivered under the Contract to be free from defects in design, material, or workmanship and against damage caused prior to final inspection. Unless otherwise specified, this warranty extends for a period of 1 year from the date of substantial completion.
- B. The Contractor shall promptly (within 48 hours) repair or replace all defective or damaged items delivered under the Contract. The Contractor will haul away all defective or damaged items prior to substantial completion.
- C. In the event of equipment failure, during such time, or in such a location that immediate repairs are mandatory, the Contractor shall respond promptly, irrespective of time. If the Contractor is not available, the San Diego Bay Restoration Fund – South Trust (South Trust; known as the Owner) will make repairs. The Contractor shall then reimburse the Owner for parts and labor necessary to correct deficiencies as defined within the warranty clause and time.

PART 3 – EXECUTION

3.01 FINAL DOCUMENTS

- A. Project As-Built Drawings.
 - 1. Project As-Built Drawings shall be compiled by the Contractor and submitted to the Owner for translation to the Contract Record Drawings no more than 30 days following verification in writing of project completeness by the Owner.

DIVISION 01—GENERAL REQUIREMENTS
Section 017000 – Execution and Closeout Requirements

2. The Contractor shall submit the Project As-Built Drawings on full-sized (ANSI D) hard copy plans and as electronic files (compatible with AutoCAD 2012 format or later).
3. Project As-Built Drawings shall be kept current and shall be updated at the time the material and equipment is installed. Annotations to the Contract Record Drawings shall be made with an erasable colored pencil conforming to the following color code:
 - a) Additions – Red.
 - b) Deletions – Green.
 - c) Comments – Blue.
 - d) Dimensions – Graphite.
4. Project As-Built Drawings must be complete and accepted by the Owner before final completion is issued.
5. Project As-Built Drawings shall be produced using horizontal and vertical control as shown on the Contract Drawings.

B. Record Document Survey.

1. See Section 017123 – Surveying, for Record Document Survey (post-dredge and post-cover placement) requirements. The Final Survey shall be completed and submitted to the owner within 30 days of substantial completion. The Final Survey must be complete and accepted by the Owner before final completion is issued.

3.02 CLEANUP

- A. Final cleanup and daily site maintenance requirements during the course of the Work are defined in Section 360000 – Sediment Management and Handling. Those requirements are supplemented to provide the following:
1. Except as otherwise specifically provided, “clean” (for the purpose of the Technical Specifications) shall be interpreted as meaning the level of cleanliness generally provided by commercial building maintenance subcontractors using commercial quality building maintenance equipment and materials.
 2. Prior to completion of the Work, the Contractor shall remove from the San Diego Shipyard Sediment Site (Site) all tools, surplus materials, equipment, scrap, debris, and waste.

DIVISION 01—GENERAL REQUIREMENTS

Section 017000 – Execution and Closeout Requirements

3. Unless otherwise specifically directed by the Owner, the Contractor shall not hose down paved areas at the Site, including all public sidewalks and catch basins on adjoining streets.
- B. Final cleaning shall be scheduled as approved by the Owner to enable the Owner to occupy a completely clean site.

END OF SECTION

DIVISION 01—GENERAL REQUIREMENTS

Section 017123 – Surveying

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The Contractor shall provide all materials, items, operations, or methods specified, listed, or scheduled on the Contract Drawings or in the Technical Specifications, including all materials, labor, equipment, and incidentals necessary to conduct the proper surveys required to determine bathymetric elevations within the area of the Work.
- B. The Contractor shall employ an independent third-party, licensed California Professional Land Surveyor (PLS) qualified in hydrographic surveying, with an American Congress of Surveying and Mapping (ACSM) Hydrographer Certification to perform hydrographic and topographic surveys for layout of the Work, to verify dredge depths and obtain final quantity for dredging, and to verify the grades of final as-built construction for acceptance of completed Work.
- C. The Contractor shall perform hydrographic surveying as a way of accurately monitoring dredging and cover placement activities. The same equipment and methods shall be used for progress surveys and for acceptance surveys. The surveys will be performed using a fully instrumented, integrated, and dedicated hydrographic survey vessel.
- D. Contractor Survey Requirements: All work must be performed by a licensed PLS registered in the State of California.
- E. Elevation Datum: All elevations indicated on drawings refer to National Ocean Survey mean lower low water (MLLW) Datum unless otherwise noted.

1.02 INFORMATION PROVIDED BY THE OWNER

- A. Survey control has been established at the San Diego Shipyard Sediment Site (Site) by Environmental Data Solutions (San Rafael, California) and will be provided to the Contractor prior to the start of Work.
 - 1. The Contractor shall verify the location and accuracy of the control prior to starting surveying work at the Site.
- B. All other survey work needed for construction is the sole responsibility of the Contractor.

1.03 REFERENCE STANDARDS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.

DIVISION 01—GENERAL REQUIREMENTS

Section 017123 – Surveying

1. USACE - EM 1110-2-1003 (January 2002) USACE Hydrographic Surveying Engineering Manual. Available from:
http://publications.usace.army.mil/publications/eng-manuals/EM_1110-2-1003_pfl/toc.htm.

1.04 CONTRACTOR QUALIFICATIONS

- A. All survey, layout, and related work for progress surveys shall be performed under the supervision of and sealed by a PLS registered in the State of California. The surveyor(s) or engineer shall have actively engaged in hydrographic and land survey operations during the past 3 years. The surveyor or engineer shall have at least 5 years of experience computing earthwork quantities.
- B. The Contractor and the San Diego Bay Restoration Fund – South Trust (South Trust; known as the Owner) will agree on the staking requirement and frequency for each of the selected tasks from the checklist.

1.05 INDEPENDENT SURVEYOR QUALIFICATIONS AND RESPONSIBILITIES

- A. The Contractor shall retain an independent surveying firm that will be responsible for conducting certain surveying, field engineering, and related reporting activities, as specified in this section. The Contractor's independent surveyor shall satisfy the following minimum qualification requirements:
 1. Specified surveying and related field engineering and reporting shall be performed under the supervision of a PLS with current registration in the State of California.
 2. The surveying firm shall utilize, and be proficient in the use of, the survey equipment and methods specified in this section.
 3. The surveying firm and project personnel shall have performed hydrographic surveying services for at least five dredging projects of similar size and complexity (provide list of projects, reference contacts and phone numbers).
 4. The surveying firm shall provide proof of insurance.
- B. The Contractor's proposed independent surveying firm will be subject to review and approval by the Engineer.
- C. The responsibilities of the Contractor's independent surveyor shall include, but not be limited to the following:
 1. Verification of existing survey control points established for the Work.

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Section 017123 – Surveying

2. Establishment of supplemental benchmarks, control points, staff gauges, etc., as needed to conduct the Work.
 3. Installation of automatic recording tide gauge for dredging operations.
 4. Initial layout of all Work elements.
 5. Daily calibration and verification of survey system accuracy.
 6. Pre-dredge and post-dredge surveys and final acceptance surveys of all dredging, additional dredging and sand cover placement activities.
 7. As-built surveys of all completed Work.
 8. Calculation of construction quantities for the Contractor's progress payment requests.
 9. Maintenance of the "Project Record" Drawings.
 10. Preparation of as-built construction record drawings.
- D. The Contractor shall assume full responsibility for the coordination, scheduling, accuracy, and quality of the independent surveyor's work. The independent surveyor shall coordinate with the Contractor's quality control (QC) manager as necessary to fulfill project QC requirements, in accordance with Section 013100 – Project Management and Coordination and Section 014500 – Quality Control.
- E. In addition to the submittals specified in this section, the Owner reserves the right to request at any time, copies of all other survey data, calculations, and supporting documentation generated by the independent surveyor in support of the Work.

1.06 SUBMITTALS

- A. A Survey Plan shall be submitted to the Engineer for review and acceptance in accordance with Section 013300 – Submittal Procedures and Section 014400 – Remedial Action Work Plan. The Survey Plan shall include:
1. Specifications and calibration certificates for all proposed survey equipment.
 2. The name, address, telephone number, and qualifications of the surveyor, crew chief, superintendent, and all other persons who are proposed to perform survey or survey-related duties.
 3. Independent Surveyor Subcontractor Qualifications. The Contractor shall submit with the Survey Plan and the bid proposal the qualifications of the Contractor's independent surveyor subcontractor.

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- B. Independent Surveys: The Contractor shall submit to the Engineer within 24 hours of completing Independent Surveys. The submittal must include: an AutoCAD (version 2010 or more recent) electronic file, plan view drawings with 1-foot contour intervals, and spot elevations depicting high and low points plotted at 1 foot equal to 50 feet. The AutoCAD 2010 electronic file shall include a triangulated irregular network (TIN)-based digital terrain model (DTM). American Standard Code for Information Interchange (ASCII)-format processed survey data shall be provided in x, y, z (easting, northing, elevation) format. Each data file shall include a descriptive header including, but not limited to: software and equipment information, client, project, horizontal and vertical datum, units, tidal correction, survey type, alignment, and stations surveyed.
- C. On the day the Contractor submits a request for progress payment, the Contractor shall furnish to the Engineer copies of all field notes, computations, any records relating to the quantity survey or to the layout of the work, and personal computer (PC)-compatible versions of any computer software required to interpret the finished data and records. The Contractor is responsible for converting data and drawing files to a standard software version approved by the Engineer. Standard ASCII format is pre-approved for data files. Survey data shall be provided in x, y, z (easting, northing, elevation) format. Each data file shall include a descriptive header including, but not limited to: software and equipment information, client, project, horizontal and vertical datum, units, tidal correction, survey type, alignment, and stations surveyed.
- D. The Contractor shall maintain on site a complete, accurate log of control of survey work as it progresses.
- E. The Contractor shall keep updated survey field notes in a standard field book. Copies of these field notes shall be provided to the Engineer upon request and, upon physical completion of the Contract Work, the field books shall be submitted to the Engineer and become the property of the Engineer.
- F. Sediment Dredging and Sand Cover Placement Progress Surveys. The Contractor shall submit to the Engineer within 12 hours of completing dredging or cover placement activity, the results of ongoing progress surveys and records (Windows Offshore Positioning Software [WINOPS]; DREDGEPACK by Hypack, Inc.; or equivalent) required to document compliance with the minimum sediment dredging and cover placement limits shown on the Contract Drawings. The progress surveys shall be conducted in accordance with Part 3 of this Section, and the results shall be reported in a format consistent with Article 3.07, or as approved by the Engineer, and as described in the Contractor's field engineering and surveying plan.

1.07 REQUIRED CONTRACTOR SUPPORT

- A. The Owner has set primary control points as indicated on the drawings.

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Section 017123 – Surveying

- B. If the primary control points need to be re-set, the Contractor shall provide sufficient space and safe facilities to enable the Engineer to set control points and perform other work, as required by this specification.
- C. Requests for setting primary control points shall be made at least 2 weeks prior to the need. Delays due to Contractor failure to give timely notice to the Owner for surveying services are at the sole risk and expense of the Contractor.

1.08 PRESERVATION OF SURVEY CONTROL POINTS

- A. Major survey control points will not be removed by the Contractor without the approval of the Engineer.

1.09 CONTRACTOR SURVEYS

- A. The Contractor shall establish such additional lines, grades, and controls as are needed for construction.
- B. All work performed shall be in conformance with the lines, grades and dimensions indicated on the Contract Drawings. If a discrepancy is noted between the drawings, the issue(s) shall immediately be brought to the Engineer's attention. Where tolerances are stated, the work performed shall be within those tolerances. The Engineer will determine if the work conforms to such lines, grades, and dimensions; and his determination shall be final.
- C. The Contractor assumes full responsibility for detailed dimensions and elevations measured from primary control points.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 GENERAL

- A. The Contractor shall exercise care during the execution of the Work to minimize any disturbance to existing property and to the landscape and waters in the areas surrounding the Site. Survey crews shall comply with all provisions of the site-specific Health and Safety Plan (HASP) when traversing into controlled or contaminated areas.
 - 1. If the survey work provided by the Contractor does not meet the contract requirements, the Contractor shall, upon the Engineer's Written Notice, remove and replace the individual or individuals doing the survey work. The Owner may subcontract control of surveying at the Contractor's

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expense, which will be deducted from moneys due or to become due to the Contractor.

2. The Engineer reserves the right to check all work laid out by the Contractor during the progress of the Work, as deemed necessary to verify conformance with the Contract Drawings and Technical Specifications. The Contractor shall allow a reasonable time to permit such checks (24 hours, excluding Sundays and holidays) before completing the work. These checks will be made during the regular working hours.

3.02 SURVEY CONTROL AND REFERENCE POINTS

- A. Existing survey control points are noted on the Contract Drawings and shall be used by the Contractor to establish project baseline, stationing, offsets, and work limits. The existing survey control points shall be used to establish any supplemental survey control points. For all surveys, the horizontal datum that shall be used by the Contractor is California Coordinate System Zone 6, Lambert Projection, North American Datum of 1983 (NAD83) (2009), in U.S. Feet. All surveys shall be shown in MLLW, in U.S. feet.
- B. The Contractor shall protect all survey control points prior to starting site work and preserve permanent reference points during construction. The Contractor shall not relocate site reference points without prior written approval from the Engineer.
- C. The Contractor shall promptly report to the Engineer the loss, damage, or destruction of any reference point or relocation required because of changes in grades or other reasons. The Contractor shall replace dislocated survey control points based on original survey control at no additional cost to the Engineer. Replacement of disturbed survey control points shall be done by a land surveyor licensed in the State of California.

3.03 INSPECTION

- A. The Contractor shall verify locations of site reference and survey control points prior to starting work. The Contractor shall promptly notify the Engineer of any discrepancies discovered. The Contractor shall also verify layouts periodically during Construction.

3.04 SURVEY REQUIREMENTS

- A. The Contractor shall reference survey and site reference points to the provided control monuments and record locations of survey control points, with horizontal and vertical data, on Project Record Documents.
- B. Hydrographic Surveys.

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1. Surveys will be conducted using an integrated hydrographic surveying system consisting of a survey grade multi-beam fathometer, inertial RTK-GPS with motion platform, tide gauge and computer and software.
2. Hydrographic survey procedures (positioning modes, electronic positioning system [EPS] calibration, data reduction, adjustment, processing, and plotting) shall conform to industry standards. Horizontal location observations shall compensate for errors, geodetic corrections, and atmospheric variations. Data recording, record annotating, and processing procedures shall be consistent with recognized hydrographic survey standards, in accordance with USACE Hydrographic Surveying Engineering Manual, for Navigation and Dredging Support Surveys (USACE EM 1110-2-1003 [January 2002]). Failure to perform and process such surveys in accordance with recognized standards will result in a rejection and nonpayment for work performed. Tide data from the National Oceanic and Atmospheric Administration (NOAA) tide gauge ~~#9447130~~ #9410170 shall be used to adjust the survey data to MLLW and to compare with the RTK vertical data. A tide board shall be established at the site and monitored on an interval of every 15 minutes or 0.1-foot change.
3. The Contractor shall conduct all hydrographic surveys using an inertial RTK-GPS and motion platform. The pre-dredge, post-dredge, and post placement surveys shall be accomplished using a multi-beam echo sounder system. A true beam forming sonar shall be used (interferometric systems are not applicable to this work). The progress surveys shall be accomplished using a multi-beam echo sounder sonar system to identify and confirm dredging progress. The survey vessel shall be equipped with the RTK-GPS for determining the horizontal and vertical location of the soundings. The system shall be capable of +/- 2 inch horizontal positioning accuracy and +/- 3 inches vertical positioning accuracy. The sounding equipment shall produce a high resolution, permanent record that accurately depicts bottom profiles. All sonar collection methods and equipment shall be in accordance with the USACE Hydrographic Surveying Engineering Manual, for Navigation and Dredging Support Surveys (USACE EM 1110-2-1003 [January 2002]). All proposed surveying equipment shall be approved by the Engineer prior to beginning the Work, as required by Section 01400 – Remedial Action Work Plan.
4. The Contractor shall conduct and document the quality control procedures recommended by the equipment manufacturer.
5. The Contractor shall also install an automatic recording tide gauge with telemetry system for transmitting of data to the dredges, survey vessels, and the Engineer. The tide gauges shall provide a continuous recording of tidal change for every 15-minute interval or for each 0.1-foot change,

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whichever occurs first. Tide levels shall be recorded in the project (MLLW) datum, with these levels visually provided in the operator's cab of the dredge at all times during the dredging and cover placement process to allow proper adjustment of dredge and cover placement depth. The Contractor shall provide the Engineer with suitable receiver for receiving tide gauge data from the Contractor's tide gauge.

6. Soundings.

- a) A multi-beam survey will be required for all hydrographic surveys except underpier including the Pre-Dredge Baseline survey, the Final Dredging Acceptance by sediment management unit (SMU) survey, the Final Cover Placement and the Record Document survey. The multi-beam survey will be accomplished during tidal water surface elevations equal or greater than +0 feet MLLW.
- b) All multi-beam hydrographic surveys shall be conducted with a 200 percent bottom coverage.
- c) All multi-beam hydrographic survey data shall be collected at a frequency of 200kHz and utilizing a multi-beam system capable of one degree beam widths.
- d) Sounding lines shall extend a minimum of 50 feet beyond the project survey boundaries or as otherwise approved by the Engineer. Intervals between soundings on each line shall not exceed 1 foot during raw data collection and the data shall not be decimated more than 5 feet for the DTM. In areas that there are toes of slope and tops, the 5-foot decimated data may need to be augmented at a denser interval, to accurately depict the toes or tops of cut slopes.
- e) All post-placement completion surveys as well as the post-dredging surveys shall be completed within the same survey area with the same survey coverage as the pre-dredging survey. Print out of sounding values on survey charts shall not deviate more than 5 feet left or right from the initial survey line.
- f) Soundings shall be based on MLLW datum.
- g) All sonar collection procedures, methods and equipment specifications shall be in accordance with the USACE Hydrographic Surveying Engineering Manual, for Navigation and Dredging Support Surveys [USACE EM 1110-2-1003 (January 2002)].

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Section 017123 – Surveying

2. Progress Surveys. The daily and interim data derived from the Contractor's dredging software output.
3. Final Dredging Acceptance Survey(s) by SMU. The data derived from a first pass survey by a multi-beam shall be used in verifying required dredge depths and grades, and for computing the quantities for dredging. The multi-beam survey may be repeated and compensated one additional time for confirmation of second-pass dredging, as required based on the first-pass survey. Additional surveys will be completed at no cost to the Owner should additional work be required to attain the required dredge depths and grades.
4. Post-Cover Acceptance Survey. The data derived from multi-beam surveys after cover placement shall be used in verifying required cover elevations and grades. This survey shall be repeated at no cost to the Owner should additional work be required to attain the required cover elevations and grades.
7. Record Document Survey. This survey shall document the final accepted dredging and cover placement elevations as constructed, in accordance with Article 3.08 of this Section. The data derived from this survey shall be used in preparing the Record Drawings in accordance with Section 017000 - Execution and Closeout Requirements.
8. All independent surveys shall be accomplished with the same independent licensed professional surveyor and equipment, and use the same data processing and interpolation methods.

3.05 PREPARATION

- A. Establish and protect survey control points and tide gauges from traffic, construction equipment, dredging equipment and vessel traffic.
- B. Furnish, set, and maintain, in good order, all ranges, buoys, and other markers necessary to define the Work and to facilitate inspection. Also establish and maintain a tide gauge in a location where it may be clearly seen during dredging operations and inspection. Include all costs for providing the tide gauge and other survey control in the applicable bid prices for sediment dredging and cover placement work.
- C. Establish a method of horizontal positioning and vertical control before dredging begins. The proposed method and maintenance of the horizontal positioning and vertical control system shall be subject to the approval of the Engineer and if, at any time, the method fails to provide accurate location for the dredging operations, the Contractor will be required to suspend operations. Lay out all Work using horizontal and vertical measurements from physical structures, as

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indicated on the drawings. The accuracy of all measurements taken from these points is the Contractor's responsibility. Furnish and maintain all templates, platforms, equipment, range markers, transponder stations, and labor as may be required to lay out the Work from the control points or features shown on the Contract Drawings. Maintain all points established for the Work until authorized to remove them.

- D. Establish a positioning control system for dredging as described in Section 352023 – Dredging.

3.06 SURVEYS

- A. Pre-Dredge Baseline Survey: The Contractor's independent surveyor shall conduct a Pre-Dredge Baseline survey at least five working days prior to dredging activities. The Engineer shall be notified, in writing, at least five working days in advance of baseline survey, and the Engineer shall be permitted to accompany the survey party and to inspect the data and methods used in preparing the baseline map. This survey will serve as the Pre-Dredge Baseline for the basis of payment.
- B. Final Dredging Acceptance Survey by SMU: The Contractor's independent surveyor shall conduct a post-dredging survey no later than 2 working days after the completion of all dredging activities in a SMU. The Engineer shall be notified, in writing, at least 2 working days in advance of the post-dredge survey, and the Engineer shall be permitted to accompany the survey party and to inspect the data and methods used in preparing the final assessment and estimate. If the post-dredge and survey confirms the area to be at design grade, the work within that area will be complete. Should the work be determined to be incomplete, the Contractor shall immediately perform such additional work as may be necessary to satisfactorily complete the work to the satisfaction of the Owner. Final estimates will be subject to deductions and adjustments to deductions previously made because of excessive over-depth dredging and/or dredging outside of the indicated or authorized areas, or disposal of material in an unauthorized manner.

3.07 DREDGING AND SAND COVER PLACEMENT PROGRESS SURVEYS

- A. Progress surveys for dredging and sand cover placement activities shall be conducted on a daily basis, using the equipment and methods specified in Article 3.04, and elsewhere in this Section.
- B. The areal coverage of daily progress surveys for sediment dredge areas shall encompass the entire area of that day's dredging, plus an additional area of at least 50 feet beyond the outside perimeter of the dredged area. WINOPS; DREDGEPACK by Hypack, Inc.; or equivalent shall be used to monitor dredging progress.

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- C. The results of daily progress surveys shall be submitted to the Engineer within 24 hours of completing the daily dredging or cover placement activity, as applicable. The Engineer will utilize the daily progress survey submittals to verify that dredging and cover placement limits are within the specified tolerances. The Owner reserves the right to direct the Contractor to cease sediment dredging and/or cover placement activities, at no expense to the Owner, in the event that the Contractor fails to submit the results of progress surveys within the specified time frame.
- D. The progress surveys shall be submitted in the form of a grid plan and cross-section drawings, as prepared by the Contractor. The grid plan shall indicate the location of each cross-section. The cross-sections shall be computer generated, and shall conform to the following format and informational requirements:
1. Plot cross-sections at a horizontal scale of 1 inch equals 10 feet (maximum) and vertical scale of 1 inch equals 5 feet (maximum), with axes shown on margins.
 2. Note grid line identification number and/or coordinates for each cross-section
 3. Show existing grade, specified neat line dredging, allowable over depth limits and cover placement grades.
 4. Show survey point locations.
 5. Indicate applicable dates for dredging, cover placement and associated surveying activities.
 6. Date and sign each cross-section prior to submitting to the Engineer.
- E. The Contractor shall conduct progress computations for any period for which progress payments are requested. For progress payments, dredge quantity calculations shall be prepared by the Contractor using the TIN volume technique, and using Autodesk Civil 3D, Autodesk Land Development Desktop, HYPACK™ MAX, Terramodel, or other commercially available software, as approved by the Engineer. Additionally, the Engineer will make such computations as are necessary to verify the quantities of progress payments. Final measurement of dredge quantities will be made by the Engineer and will be based on the Final Dredging Acceptance by SMU survey in accordance with Section 012000 - Price and Payment Procedures.
- F. Survey Records. On the day the Contractor submits request for progress payment, the Contractor shall furnish the Engineer originals of all field notes, computations, any records relating to the quantity survey (dredging) or to the layout of the Work, and a PC-compatible version of any computer software required to interpret the finished data and records. The Engineer will use them as necessary to verify the

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amount of progress payments. The Contractor shall retain copies of all such material furnished to the Engineer.

- G. The Owner may conduct independent progress surveys for quality assurance purposes. The Owner will notify the Contractor if review of the survey data indicates a discrepancy between the Contractor's and the Owner's progress survey, and the Owner may request that the Contractor re-survey the area(s) where discrepancies are present. Any re-surveying and associated re-work required due to surveying error(s) on the part of the Contractor or Contractor's independent surveyor shall be provided at no additional cost to the Owner.
- H. In the event that the Contractor's or the Owner's progress surveys indicate that the Work is out of compliance with the Contract Documents, the Owner may direct the Contractor to adjust dredging, and/or cover placement procedures, including the removal and replacement of any cover that is utilized, until compliance is achieved, at no additional expense to the Owner. The Owner further reserves the right to direct the Contractor to stop dredging and/or cover placement activities if it is determined, in the opinion of the Owner, that the Contractor's methods are not suitable to achieve the specified construction tolerances. In the event that the Owner stops the work, the Contractor shall take whatever measures are required, including mobilization of alternative equipment, to achieve the specified construction tolerances, at no additional cost to the Owner.

3.08 FINAL AS-BUILT SURVEY

- A. Upon completion of the Work, the Contractor shall complete a final as-built survey and plan drawings of the Work for inclusion in the construction records report to be prepared by the Engineer.
- B. The as-built survey shall include a hydrographic survey of all final grades within the project limits. The accuracy of the hydrographic survey shall be consistent with the requirements of Article 3.04 for surveying, respectively. The as-built survey shall include the location of all existing structures within the project limits, any cut or broken piling stubs that remain, as well as any structures installed or modified as part of the Work.
- C. The results of the as-built survey shall be presented in the form of contour plan drawings with 1-foot contour intervals. The location of installed utilities and structures shall be clearly indicated with appropriate symbols. The associated survey data shall also be submitted to the Engineer, in accordance with the requirements of Paragraph 1.06 of this Section.

END OF SECTION

DIVISION 02—EXISTING CONDITIONS

Section 024100 – Demolition and Debris Removal

PART 1 – GENERAL

1.01 SUMMARY

- A. Demolition and debris removal consists of all transportation, labor, materials, equipment, and incidentals necessary to perform demolition, removal, and disposal as described in the Technical Specification and items noted on the Contract Drawings.
- B. All materials resulting from demolition and debris removal work, unless specified otherwise, shall become the property and responsibility of the Contractor.
- C. The Work includes, but is not strictly limited to, the following:
 - 1. Demolishing, removing, and disposing of the entire timber pier structure, including, but not limited to, timber piles, HP14 square I-beams, stringers, guardrails, concrete pedestal, utilities, and miscellaneous features designated on the Contract Drawings. All piles shall be removed, and no portion shall remain below the surface.
 - 2. Removing and disposing of debris specifically identified on the Contract Drawings.
 - 3. Removing and disposing of chemically treated wood waste (TWW) segregated from dredging debris.
- D. The extent and location of demolition and debris removal work is indicated on the Contract Drawings. Underground and submerged structures may not be in the exact location as shown.
- E. Demolition and debris removal work shown on the Contract Drawings is schematic in nature and is intended to identify general features of the structures, materials, or other obstructions to be removed. Lack of complete details on the Contract Drawings will not be considered as grounds for additional compensation.

1.02 EXISTING SITE CONDITIONS

- A. Site access from land shall be from the area as shown on the Contract Drawings. The San Diego Shipyard Sediment Site (Site) may also be accessed by water.
- B. The Contractor shall assume full responsibility for the proper disposal, treatment, reuse, recycling, or salvage of all demolished and debris materials including TWW.
- C. The Contract Drawings show existing features and equipment but may not show all equipment and materials existing at the Site.

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- D. Results of the side-scan survey are included in Appendix B of the Basis of Design Memorandum.
- E. The Contract Drawings indicate the character and general location and coverage of existing structures, riprap, submerged utilities, railway extensions, and identified debris at the Site's waterfront and slopes. The information provided is general in nature and may not be completely representative of all features present at the Site at the time of construction. The Contractor shall ascertain, to its own satisfaction, the condition of existing slopes and ground coverage, including debris, riprap, outfalls, and other materials that will need to be removed or protected during the course of demolition and debris removal work.

1.03 EXISTING UTILITIES

- A. Existing utilities of record are shown on the Contract Drawings to the extent possible. These utilities are shown for convenience only and the San Diego Bay Restoration Fund – South Trust (South Trust; known as the Owner) assumes no responsibility for improper locations or failure to show utility locations on the Contract Drawings. The Contractor shall determine existing utility locations.
- B. The Contractor shall note the location and extent of overhead utilities. Caution should be taken when working near overhead utilities. The Contractor shall be responsible for the safety of its employees and equipment when working near overhead utilities.
- C. The Contractor shall be responsible for any breakage of utilities or services that are to remain resulting from its operations and shall hold the Owner and its consultants and agents harmless from any claims resulting from disruption of or damages to same.
- D. The Contractor shall maintain all existing utilities in continuous service during its operations, unless the Contractor receives written approval from the utility owners for interruption of service. The Contractor shall pay all permit, inspection, and other fees levied by the utility owners.
- E. The Contractor shall anticipate that the requirements of the utility owners may hinder, delay, and complicate execution of the Work. The Contractor will not be entitled to any claim for damages because of hindrances, delays, and complications caused by or resulting from requirements imposed by the utility owners.

1.04 APPLICABLE DOCUMENTS AND REGULATIONS

- A. Standard Specifications for Public Works Construction.
- B. State of California Division of Industry Safety:

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1. Construction Safety Orders.
2. General Industrial Safety Orders.
- C. Code of Federal Regulations (CFR) Parts 260-270 U.S. Environmental Protection Agency (USEPA) Regulations for Identification, Generation, Treatment, Storage, and Disposal of Hazardous Wastes.
- D. Code of California Regulations (CCR) Parts 22260-22270 California Regulation for Identification, Generation, Treatment, Storage, and Disposal of Hazardous Wastes.
- E. California State Health and Safety Code, Division 20, Chapter 65.

1.05 SUBMITTALS

- A. The Contractor shall provide the following submittals in accordance with Section 013300 – Submittal Procedures and as further specified in this Section:

1. Demolition Plan.

As part of the Remedial Action Work Plan (RAWP), the Contractor shall submit to the Engineer a Demolition Plan that, at a minimum, addresses the following:

- a) Worker safety.
- b) Protection of the public.
- c) Work sequence and schedule.
- d) Protection of the environment.
- e) Material identification, indicating anticipated types and quantities (by weight) of materials to be salvaged, recycled, and disposed of properly. Indicate whether materials will be sorted on site or co-mingle.
- f) Off-site disposal sites for each classification of demolition and debris materials.
- g) Floating containment boom details.

2. Hazardous Materials Transportation Plan.

As part of the RAWP and described in Section 360000 – Sediment Handling and Management, the Contractor shall submit to the Engineer a Hazardous Materials Transportation Plan.

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- B. The Contractor shall submit a copy of the correct and approved waste profile, as provided by the disposal site, to the Engineer a minimum of 48 hours prior to transporting TWW to the designated disposal facility. The Contractor shall at the same time submit a copy of the appropriate disposal site permit demonstrating its authorization to accept TWW that has been identified at the Site.
- C. The Contractor shall submit copies of weight tickets and non-hazardous waste manifest to the Engineer after TWW has been accepted at the disposal facility.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Products required to accomplish or be incorporated into the Work as specified in this Section shall be as selected by the Contractor, subject to approval by the Engineer.

2.02 CONTAINMENT BOOM

- A. Floating containment boom shall be a commercially produced boom capable of being anchored in position and of a depth below water that all floating debris generated during piling removal, shoreline demolition, and dredging and shoreline activities will be contained.

PART 3 – EXECUTION

3.01 GENERAL

- A. The Contractor shall remove and recycle, salvage, or dispose of designated structures, debris, and other materials identified on the Contract Drawings or in the Technical Specifications in accordance with Section 360000 – Sediment Handling and Management, all applicable regulations, codes, and ordinances. Care shall be taken that demolition work is accomplished such that damage does not occur to adjacent structures or improvements. Any improvements not designated for removal that are damaged by the Contractor shall be repaired or replaced by the Contractor at the Contractor's expense.
- B. The Contractor shall not use blasting or other special methods for the removal of an existing structure or obstruction.
- C. The Contractor shall not interfere with the use of or access to adjacent facilities.
- D. The Contractor shall not burn materials on site.

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3.02 CONTAINMENT BOOM

- A. The Contractor shall maintain a floating containment boom during demolition and debris removal activities. Material that inadvertently falls into the water shall be removed on an ongoing basis during all hours of operation. The Contractor shall remove all floating debris prior to stopping work each day.

3.03 DEMOLITION OF TIMBER PIER

- A. The Contractor shall provide, erect, and maintain temporary barriers, security, and other such precaution as required to protect the work area.
- B. The Contractor shall install a containment boom per approved plans prior to demolition of the timber pier. The Contractor shall maintain, repair, and re-deploy the boom during demolition as necessary to comply with project permits and the Engineer's direction.
 - 1. All demolition debris, dust, sediments, silt, water runoff, and other deleterious substances dropped into the waters shall be completely contained by the barrier and silt curtain during demolition. Rubbish, garbage, chemical, sanitary, hazardous, and oily waste shall not be permitted to enter any waters at any time.
 - 2. Breaches in containment shall be immediately repaired. The Contractor shall notify the Engineer by fastest means possible of breaches that spill contaminants into surrounding waters. The Contractor shall contain spills by re-deploying curtain, adding additional boom, vacuums, and other means to minimize consequences.
 - 3. Floating debris shall be cleared from water surfaces daily.
 - 4. Containment barriers shall not be moved until waters within the containment are free from debris, suspended materials, and contaminants and meet project permit requirements.
 - 5. Lowering of containment barriers for the passage of water-borne equipment shall only be done when:
 - a) It is the only available means to allow passage.
 - b) All floating debris has been removed from the area protected by the silt curtain.
 - c) Suspension of materials from within the area protected by the containment boom has been minimized to meet the turbidity requirement of the permits.

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- d) Passage will not cause spillage of debris or migration of sediments into adjacent waters.
- C. The Contractor shall remove and dispose of all timber, metal, electrical, mechanical, metals, hardware, concrete, and other miscellaneous materials. The Contractor shall be prohibited from allowing materials located above water to enter the water.
- D. The Contractor shall remove all treated timber piles, pile caps, and deck per Paragraph 3.08.
- E. The Contractor shall coordinate disconnection of abandoned conduits and utilities with the Owner prior to demolition activities.
- F. The Contractor shall completely remove pilings by pulling, in a manner consistent with the permit conditions. The removed pilings shall be transported to the approved offloading facility and disposed of properly. If an existing pile or pile stub is inadvertently broken off above the mudline, it shall be re-cut to below final required grade or as otherwise directed by the Engineer.
- G. The Contractor shall plan, coordinate, and conduct operations to prevent interference with operations at the Site.
- H. The Contractor shall note the interfaces between structures to be demolished and structures to be left in place as shown on the Contract Drawings.

3.04 REMOVAL OF IDENTIFIED DEBRIS

- A. Debris identified on the Contract Drawings shall be removed in its entirety.

3.05 REMOVAL OF ADDITIONAL DEBRIS ENCOUNTERED BY DREDGING

- A. For requirements related to the removal of incidental debris, see Section 352023 – Dredging.

3.06 DISPOSAL OF NON-TREATED WOOD WASTE

- A. The Contractor shall make every effort to segregate non-debris materials (sediments) from the debris before being transported off site. Truck loads will be verified by the Engineer prior to departing to the disposal facility.
- B. All materials shall become the property of the Contractor and shall be recycled or legally disposed of off site.
- C. The Contractor shall pay all required transportation costs and disposal and tipping fees.

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- D. Waste materials and demolition debris shall be transported by barge or truck to the approved offloading facility and then disposed at an approved upland Subtitle D landfill as described in Section 360000 – Sediment Handling and Management.
- E. No materials shall be disposed of in adjoining waterways.
- F. Burning of demolition debris shall be prohibited.

3.07 STORAGE PROCEDURES FOR TREATED WOOD

- A. The Contractor shall store TWW in accordance with the alternative management standards (AMS) described in CCR, Title 22, Division 4.5, Chapter 34. If TWW is to be store on site pending disposal, the following requirements shall be followed:
 - 1. Store TWW off the ground by placing it on blocks, on concrete surfaces, or in containers.
 - 2. Cover TWW during inclement weather to prevent rain water from leaching chemicals out of the TWW.

3.08 DISPOSAL PROCEDURES FOR TREATED WOOD

- A. The Contractor shall segregate any TWW that may be generated from underwater dredging operations. The waste characteristics of this material shall be evaluated per the direction of the Engineer at a later date. The evaluation will depend on the quantity and physical characteristics of the TWW.
- B. The Contractor shall dispose of TWW, in accordance with the AMS described in CCR, Title 22, Division 4.5, Chapter 34, and all other federal, state, and local requirements of the proper waste loading, transportation, and disposal of TWW materials as hazardous waste.
- C. The Contractor shall provide hazardous waste manifests. The Contractor shall ensure that the hazardous waste manifests from point of origin to the point of disposal are filled out completely and accurately for complete tracking of TWW materials. After the shipment has been properly loaded, covered, and secured, the Contractor shall have the Engineer initial the upper left-hand corner of the hazardous waste manifest. The Contactor shall then submit the completed hazardous waste manifest to the Engineer. The Contractor shall notify the Engineering a minimum of 24 hours in advance of the time when signatures are anticipated to be required.

3.09 CLEANUP

- A. The area shall be cleaned after removal of demolished structures and debris. No debris, rubble, or litter shall be left at the Site from any demolition activities.

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- B. Debris and rubbish shall be removed and transported in a manner that will prevent spillage onto existing streets or adjacent areas. All debris shall be removed off site at the Contractor's expense.
- C. All applicable federal, state, and local regulations regarding handling and disposal shall be complied with strictly.

END OF SECTION

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Section 352023 – Dredging

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The Work consists of dredging portions of the San Diego Shipyard Sediment Site (Site) to accomplish the required removal of chemically impacted sediment, per the Cleanup and Abatement Order (CAO). This Work includes furnishing all labor, materials, tools, equipment, and incidentals required for dredging, sediment transport, sediment dewatering, and stockpiling as described in the Contract Drawings and in these Technical Specifications.
1. The dredging work will be performed using an enclosed environmental bucket on a cable arm dredge and disposing of the sediment in an approved off-site landfill as described in Section 360000 – Sediment Handling and Management. Dredged material shall be offloaded at the specified Sediment Management Area (SMA) as shown on the Contract Drawings. Dredged material shall be characterized following removal and disposed accordingly.
 2. Prior to dredging, the Contractor shall install landside pipeline to replace the existing underwater salt water fire main pipeline shown on the Contract Drawings. The replacement pipeline shall be installed and connected prior to removal of the existing pipeline.
 3. Cover material shall be placed in areas beneath piers or where dredging operations are impractical due to access or protected features as an alternative to dredging. Cover material shall be placed in accordance with the requirements of Section 352026 – Cover Material Placement of these Technical Specifications.
 4. The estimated removal volume to achieve the required dredge surface is based on the available survey information as shown on the Contract Drawings. The estimated volume for removal is approximately 52,600 cubic yards, which includes a 1-foot allowable overdepth tolerance beyond the required dredging elevations.
 5. The payable volume is provided in Section 004143 – Bid Form. The Contractor shall be paid for dredging to the required dredge lines and elevations plus a one 1-foot payable overdepth tolerance.
 6. The Contractor shall remove as much free water as practical from the dredged material barges prior to offloading material by pumping water from the barge during dredging or prior to offloading in accordance with Section 360000 – Sediment Handling and Management. Water removed by pumping shall be pumped to a water management treatment system for

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clarification prior to discharging to the approved storm sewer utility location(s) shown on the Contract Drawings.

7. The dredged sediments were determined to not be suitable for open-water disposal and shall be transported off-site to a pre-approved disposal facility as described in Section 360000 – Sediment Handling and Management.

1.02 CONSTRUCTION PERIOD

- A. The Work described in the following sections shall be performed during the allowable in-water work period from September 17, 2013, through March 31, 2014. Work beyond these dates is not permitted due to the Least Tern restriction specified by California State Lands Commission.
- B. Vessel movement at the Site shall be restricted from September 13 to 17, 2013, to accommodate previously planned water quality sampling at the Site.
- C. In-water dredging activities shall commence on **Tuesday, September 17.**

1.03 DEFINITIONS

- A. **Identified Debris:** Identified debris is defined as any solid waste materials other than sediment dredged as part of the dredging operations, such as logs, wire, cable, steel bands, anchors, lumber, trash, or concrete greater than 18-inches in any direction. Identified debris has been located using side-scan sonar survey results and is shown on the Contract Drawings. Identified debris shall be transported off-site for final disposal under a separate pay item from dredged sediment.
- B. **Incidental Debris:** Incidental debris is defined as any non-sediment material removed during dredging operations and shall be handled and managed in the same manner as dredged sediment. No separate payment shall be made for incidental debris removal.
- C. **Dredging:** Dredging refers to removal of material from below the water surface or below approximately elevation +6 mean lower low water (MLLW). All dredging operations shall be conducted from the water utilizing marine based equipment.
- D. **Dredging Limits:** The Dredging Limits are defined as the horizontal extents by which active dredging and/or cover placement operations shall be conducted under this Contract. The Dredging Limits are shown on the Contract Drawings. There shall be no dredging, offloading or cover placement work conducted outside of the Dredging Limits unless approved or directed by the Engineer in writing.

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- E. Sediment Management Unit (SMU): A SMU is defined as a subarea of the dredge prism with designated removal elevations or slopes within the Dredging Limits used to create the dredge prism.
- F. Required Dredge Line or Elevation: The grade within an area above which the Contractor is required to remove all material, including associated side slopes or slough materials. Dredging beyond the Required Dredge Line or Elevation but above the Allowable Overdepth Line is acceptable and payable per the Measurement and Payment terms detailed in Section 012000 – Price and Payment Procedures.
- G. Allowable Overdepth Line: A surface located 1.0-foot below the Required Dredge Line (or Elevation) above which removed material will be paid. Dredging beyond the Allowable Overdredging Line but above the Maximum Over-depth Line is allowable but is considered non-payable dredging and will not be paid.
- H. Maximum Overdepth Line: A surface located 2-feet below the Required Dredge Line (or Elevation) that will be allowed for the Contractor to accomplish their means and methods for dredging. Dredging beyond the Maximum Overdepth Line is called Excessive Dredging and is expressly prohibited by the remedial action permits and will not be allowed.
- I. Excessive Dredging: Material outside of the dredging limits and/or below the Maximum Over-depth Line is Excessive Dredging. The Contractor shall not perform Excessive Dredging. Contractor will not be paid for Excessive Dredging and will be responsible for any regulatory agency fees and/or fines incurred as a result of Excessive Dredging. The Contractor shall not perform Excessive Dredging below the toe of cuts along the exterior limits of dredging to obtain required grades and side slopes. Excessive Dredging at the toe of slopes may cause significant sloughing of side slope material, which may increase resuspension and transportation of sediment, and/or may cause damage to existing facilities. The Engineer and San Diego Bay Environmental Restoration Fund – South Trust (known as the Owner) may require the contractor to correct instances of Excessive Dredging if they believe that existing slopes, structures, or measures of project success are jeopardized in any way by the excessive dredging.
- J. Side Slope: The Side Slope is the slope to be excavated between the outer edge of the dredge cut at design depth (toe) and the intersect point at either original ground level (top of cut) or intersection with the design depth of an adjacent SMU. Side slopes shall be constructed to the lines and limits shown on the Contract Drawings.
- K. Slough Volume: Slough Volume is defined as material that sloughs into the dredge area from sediment on a side slope or vertical face between dredge cuts that loses toe support as a result of making a vertical cut to grade or to an adjacent dredge surface. Slough volume has been accounted for in the estimated removal

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volume utilizing 3Horizontal:1Vertical design slopes. Any sloughing that propagates from beyond this slope inclination will not be payable volume and shall instead be incidental to the contractor dredging price.

- L. Pay Volume: Pay Volume is the quantity of dredged material calculated on an in situ basis above the Allowable Overdredging elevation as determined through pre- and post-dredge surveys. Survey requirements, scheduling and associated volume calculations are detailed in Section 017123 – Surveying.
- M. Sediment Management Area (SMA): The SMA is defined as the upland portion of the Site that is used to offload, stockpile, rehandle, dewater, and transfer sediment and debris for off-site disposal allowed for Contractor use. The SMA limits are shown on the Contract Drawings.
- N. Hard Material: Hard material in its natural state is defined as material such as boulders or fragments too large to be removed in one piece by the dredging equipment. In the event that the Contractor encounters hard material within the Dredging Limits during dredging operations, the Contractor shall immediately notify the Owner and Engineer.

1.04 REFERENCE STANDARDS

- A. The publications listed below for a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.
 - 1. Code of Federal Regulations (CFR).
 - a) 33 CFR 81: 72 COLREGS (International Regulations for Preventing Collision at Sea -1972): Implementing Rules.
 - b) 33 CFR 84: Annex 1: Positioning and Technical Details of Lights and Shapes.
 - c) 33 CFR 85: Annex II: Additional Signal for Fishing Vessels in Close Proximity.
 - d) 33 CFR 86: Annex III: Technical Details of Sound Signal Appliances.
 - e) 33 CFR 89: Inland Navigation Rules: Implementing Rules.
 - 2. U.S. Coast Guard (USCG).
 - a) M16672.2(1999): Navigation Rules Instruction Manual.

1.05 SUBMITTALS

A. Dredging and Offloading Plan.

1. As part of the Remedial Action Work Plan (RAWP), the Contractor shall prepare and submit a detailed, written Dredging and Offloading Plan to the Owner and Engineer within 2 weeks of Notice of Award as required in Section 013300 – Submittals and Section 014000 – Remedial Action Work Plan. Sediment removal operations shall not begin until: 1) the RAWP has been reviewed and approved by the Engineer; 2) agency-required notifications have been completed in accordance with the permits; and 3) the Contractor schedules and attends a pre-dredge conference with the U.S. Army Corps of Engineers (USACE) and other permitting agencies as required by the permits, and receives agency approval to begin dredging as a result of that conference. The RAWP must be submitted to the USACE at least 1 week prior to the pre-dredge conference.
2. At a minimum, the Dredging and Offloading Plan shall contain the following:
 - a) Work Sequence and Equipment.
 - 1) Order in which the Work is to be performed, indicating the work sequence.
 - 2) Construction schedule that identifies the timing and sequencing of the major activities and milestones of the construction. These shall include, but not be limited to, mobilization, relocation of underwater salt water fire main, start of dredging, duration of dredging and offloading, demobilization, and cleanup.
 - 3) Number, types, and capacity of equipment to be used, including names of dredge(s) and other marine vessels to be used.
 - 4) Hours of operation.
 - 5) Methods of operation and the time required to complete each activity.
 - b) Means and Methods for Dredging, Transport, Handling, and Offloading.
 - 1) Methods, procedures, and equipment to be used for dredging.

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- 2) Methods, procedures, and equipment to be used for transport of sediments to the SMA, including procedures for preventing release of water from the dredge material barge.
 - 3) Methods, procedures, and equipment to be used for offloading of sediment and debris, including a spill prevention apron.
 - 4) Methods, procedures, and equipment for preventing untreated sediment and effluent release from the SMA into the receiving waters. All effluent to be discharged from the SMA to the specified sewer discharge location will require treatment in order to achieve water quality criteria required by the project permits.
 - 5) Methods, procedures, and equipment for cleanup and removal of the SMA.
 - 6) Methods, procedures, and controls to protect existing facilities against damage.
 - 7) Methods, procedures, and controls to be used to segregate, handle, transport, and dispose of debris to an appropriate disposal facility in accordance with applicable regulations.
- c) Means and Methods for Operating the SMA.
- 1) The Dredging and Offloading Plan for this work shall describe the perimeter containment to contain the sediment and water. Measures to prevent and capture spillage during rehandling and transport of sediment must be clearly presented in the Dredging and Offloading Plan.
 - 2) Stockpiling at the SMA: The Dredging and Offloading Plan shall describe the stockpiling operations (if used). Measures to prevent loss of sediment or associated water during stockpiling and rehandling within the SMA shall be described. The Dredging and Offloading Plan shall describe anticipated loads on docks and how the Contractor will ensure that load restrictions are observed. Show location and size of stockpile (if used).
 - 3) Methods, procedures, and equipment to be used to dewater dredged material and to treat the effluent to meet water quality criteria and permit conditions.

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- 4) Methods, procedures, and controls to protect existing facilities against damage.
 - d) Methods, procedures, and equipment for offloading and disposal of dredge material, and identification of the proposed off-site landfill facility.
 - e) Dredge Positioning and Progress Surveys.
 - 1) Procedures and equipment for performing daily progress surveying.
 - 2) Layout of the Work and methods for positioning of dredge equipment to meet the horizontal and vertical accuracy requirements.
 - 3) Best management practices (BMPs) proposed by the Contractor to minimize the potential for water quality exceedance.
 - f) Incidental Debris Removal.
 - 1) Procedures and equipment for collecting and disposing of submerged and floating debris encountered during dredging operations.
 - 2) Procedures and equipment for offloading, stockpiling, transport, and disposal of debris. This information shall include methods to prevent spillage of debris back into the water during offloading and cleanup of the barge.
- B. Dredging Management Plan.
1. The Owner and Engineer will develop a Dredging Management Plan (DMP) prior to construction, as described in Section 013300 – Submittal Procedures. The DMP will be reviewed by, modified to accommodate the Contractor's proposed Remedial Action Work Plan and accepted by the Contractor for implementation during the project.
 2. The DMP shall contain standard operating procedures (SOPs) for the project to assist in preventing accidental spills as well as guidelines to follow in the event of a spill.
- C. Vessel Management Plan.
1. The Contractor's Vessel Management Plan shall describe the proposed vessels, navigation routes, coordination of activities with waterway users,

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and the methods for controlling vessel traffic during the Work. The Vessel Management Plan shall include, but shall not be limited to, the following:

- a) Compliance with the Reference standards listed in Paragraph 1.04 of this Section for all vessel operations employed in the Work.
- b) Methods for monitoring navigation activities of others near dredging and cover material placement activities.
- c) Vessel traffic plan indicating proposed navigation routes, names, types, and dimensions of vessels accessing the slip, and projected schedule of access requirements for coordination with other waterway users.
- d) Measures to coordinate with site security, military force protection, military/naval customers, and other San Diego Bay users, as necessary.
- e) Proposed vessels, including signal lighting.
- f) Moorage, anchoring, and tie-off areas.
- g) Communication procedures.

D. Construction Schedule: The Contractor shall prepare weekly updates of its Construction Schedule reflecting the progress of the Work. The updated schedule shall be submitted each week to the Engineer at the Weekly Construction Meeting.

1. Daily Report: The Contractor shall keep a daily record of the area(s) dredged, the estimated quantity of material dredged, the number of haul barge trips to the SMA, the estimated quantity of dredged materials transported to the SMA (based on in situ cubic yards), daily progress surveys, estimated quantity of debris, and a summary of other details of the Work. This daily record shall be submitted to the Engineer the morning following completion of the Work for that day in a Daily Report. The Daily Report shall be signed by the Contractor's dredging superintendent or quality control manager.
2. Weekly Report: The Contractor shall summarize the week's work in a Weekly Report to be submitted to the Engineer the following Monday morning. The Weekly Report shall identify work completed to date and anticipated work to be completed in the present week, and shall present the latest progress survey.

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1.06 JOB CONDITIONS

A. Character of Materials.

1. Subsurface investigations were performed to characterize the dredge material. Detailed results from geotechnical and chemical testing of the sediments are provided in the Basis of Design Memorandum.
2. The Contractor shall satisfy itself regarding the nature of materials present at the Site prior to bidding. The type of materials encountered at the Site may vary from the conditions indicated herein.
 - a) Variations in the type of materials encountered may occur that do not differ materially from those indicated in these specifications, and if encountered, will not be considered as basis for claims due to differing Site conditions.

B. Riprap and Incidental Debris.

1. Incidental debris in miscellaneous dimensions and materials exists at the Site within the Dredging Limits. Incidental debris is anticipated to include, but is not limited to, timber, wood, and logs; cables; concrete; asphalt; slag; welding wires; metal; and other miscellaneous construction materials.
2. Riprap and any incidental debris that may be encountered during the Work shall be disposed of at an approved off-site location in accordance with applicable local, state, and/or federal regulations.

C. Protection of Eelgrass Beds, Sea Turtles, and Marine Mammals.

1. All in-water work shall be temporarily halted if a sea turtle or marine mammal is sighted within 100 meters of the construction zone and resumed only when the sea turtle or marine mammal is safely outside of the perimeter.
2. Eelgrass beds, as shown on the Contract Drawings and identified by the Project Marine Biologist, shall not be disturbed during in-water operations, including but not limited to, anchoring, grounding, and propeller damage.
3. The Project Marine Biologist will conduct pre-construction eelgrass surveys not more than 30 days prior to commencement of in-water work near eelgrass beds, as shown on the Contract Drawings. A post-construction eelgrass survey will be conducted by the Project Marine Biologist within 30 days of completion of work near eelgrass beds, as shown on the Contract Drawings. The Contractor shall work with the

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Project Marine Biologist to accommodate eelgrass surveys described herein.

4. The Contractor shall maintain a minimum 10-foot buffer around existing eelgrass beds, as shown on the Contract Drawings.
5. When working within 50 feet of eelgrass beds, the Contractor shall drive posts along the dredge boundary to attach a silt curtain outboard of the posts such that it does not drag over the eelgrass. The Contractor shall dredge the area outboard of the curtain working away from the shore in a manner that minimizes the time period that the curtains are present.
6. In the event that eelgrass beds are determined by the Project Marine Biologist to be impacted from the work, the Contractor shall be responsible for mitigation of eelgrass beds in an area approximately 450 feet to the east of the timber pier (to be demolished as part of this Contract). Eelgrass beds will be restored by placing approximately 5 cubic yards of sand at the toe of the existing riprap slope and planting eelgrass.

D. Inherent Delays and Shipyard Activities.

1. The Contractor shall anticipate inherent delays while conducting dredging operations in the waterway. Inherent delays may include, but is not limited to, U.S. Department of the Navy (USN) tugboat traffic and commercial shipping traffic.
2. Commercial shipyard traffic shall have precedence over the Contractor's activities and will require the Contractor to stop, move, adjust, and/or slow down to accommodate vessel movement.
3. Inherent delays shall be incidental to this Contract.

E. Interference with Navigation.

1. The Site is an active work area and commercial activities shall take priority over the Contractor's operations. Conduct operations in a manner that will minimize interference with other Site activities. In the event that the Contractor's construction equipment (e.g., dredge, tug, barges, workboats, anchors, lines, environmental controls, etc.) obstructs the navigable waterway or berthing area so as to hinder movement of commercial vessels, the Contractor's equipment shall immediately be relocated.
2. Make allowances in the construction schedule for delays or interruptions due to vessel movement in the waterway.

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3. Any damage to the Contractor's equipment due to the Contractor's failure to move when required shall be at the Contractor's sole risk and expense.
- F. Protection of Existing Facilities.
1. Any damage to the bulkheads or existing facilities caused by the Contractor's operations, as determined by the Engineer, shall immediately be repaired to the pre-project condition at the Contractor's expense.
 2. Condition Survey of Existing Structures: The Contractor and the Engineer shall jointly review and verify the pre-construction condition of bulkheads and other existing facilities within the work areas prior to beginning work to ascertain existing conditions.
- G. Security.
1. All Contractor personnel and personnel of their subcontractors shall be required to undergo required site safety training prior to accessing the Site. Documentation of completion of safety training for all personnel shall be kept on-site at all times throughout the Work.

1.07 MISPLACED MATERIAL

- A. Should the Contractor, during the execution of the Work, lose, dump, throw overboard, sink, or misplace any material, dredge, barge, machinery, or appliance, promptly recover and remove the same. Give immediate verbal notice, followed by written confirmation, of the description and location of such obstructions to the Engineer and mark and buoy such obstructions until they are removed.
- B. Should the Contractor refuse, neglect, or delay compliance with this requirement, such obstructions may be removed by the Owner or its agents, and the cost of such operations may be deducted from any money due to the Contractor, or may be recovered from the Contractor's bond.
- C. The liability of the Contractor for the removal of a vessel wrecked or sunk without his fault or negligence shall be limited to that provided in Sections 15, 19, and 20 of the River and Harbor Act of 3 March 1899 (33 U.S.C. 410 et seq.).
- D. The Contractor shall be responsible for any fees, fines, penalties, or other costs resulting from misplaced materials.

1.08 ACCESS TO CONTRACTOR'S EQUIPMENT

- A. The Contractor shall grant access to its dredge, barge(s), tug(s), and all other equipment mobilized for the Work for inspection purposes, to the Owner or to any Owner-designated representative. Regulatory agency staff may also require

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access to equipment and will be escorted by Owner-designated representatives at all times.

PART 2 – PRODUCTS

2.01 POST-DREDGE COVER MATERIAL

- A. Sand cover material as specified in Section 352026 – Cover Material Placement shall be used for post-dredge cover as directed by the Engineer.

2.02 QUALITY OF MATERIALS AND EQUIPMENT

The following sections describe the equipment required for Site dredging operations.

A. Dredging Equipment.

1. All dredging under this Contract shall be performed using a mechanical-type dredge. Mechanical dredging equipment will employ enclosed bucket system mounted on a cable-arm dredge, or equivalent, as approved by the Engineer.
2. All dredge buckets must include monitoring capabilities to inform the dredge operator if the bucket is not completely closed. The dredging bucket shall be an environmental dredge bucket, or approved equivalent, designed to maintain enclosure of sediments when the bucket is being raised through the water column and to minimize, to the maximum extent practical, the generation of suspended sediments during bucket lowering, closing, and raising in the water column. In addition, the dredging equipment shall be designed to remove sediments at near in situ densities.
3. The dredge and its associated floating platform shall be operated so as to maintain a draft suitable to work within the shallow waters and avoid running aground.
4. The floating platform, material barges, and associated equipment shall be maintained to meet the requirements of the Work, including the prompt repair of equipment failures.
5. A standard clamshell bucket may be used to excavate dense sediments or larger debris which cannot be excavated with an environmental, cable-arm bucket.

B. Dredge Bucket Positioning Equipment.

1. The dredge will be equipped with Real-Time Kinematic – Differential Global Positioning System (RTK DGPS) and the necessary sensors, to enable accurate positioning of the dredge bucket. The dredge bucket shall

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have a vertical positioning accuracy of plus or minus 2 inches and a horizontal accuracy of plus or minus 4 inches. The dredge positioning software shall be capable of:

- a) Inputting a dredge prism tile (an x, y, z file on a gridded interval of 1 foot by 1 foot).
- b) Recording all dredge sensor information electronically so that the position and movements of the dredge can be reviewed at a later date (playback capability); these playback data are to be provided as part of the Daily Report.
- c) Producing plots showing the location of each dredge bucket in the dredge area.
- d) Showing the dredge operator in real-time the depth of material as the bucket takes a bite.
- e) Using a true 3-dimensional computational system to calculate the position of the bucket taking into account the tilt and list of the dredge platform as well as the standard positioning sensors.

IHC Systems' Excavator Position Monitor (XPM) System and Hypack, Inc.'s Dredgepack System are examples of such a dredge positioning system.

2. Show that the error budget of the dredge positioning system allows it to work within the stated overdredge tolerances. The error budget should include all errors associated with measuring the positioning of the bucket.
3. The Contractor selected positioning system shall be approved by the Engineer.
4. Demonstrate the ability to achieve, monitor, and report these accuracies in the Dredging and Offloading Plan. The Contractor must verify its error budget (i.e., quality control check of all sensors one time per day) and include it in the Daily Report.

C. Tow/Tug Boats.

1. All tow/tug boats used for propelling barges and other equipment shall be equipped with GPS navigational equipment, radar, corrected compass, at least two marine VHF radios approved for Site use by the Owner, and depth sounding equipment, which is to be maintained in good operating condition during each tow. Specify the number and size of tow/tug boats to be used in the Dredging and Offloading Plan. The tow/tug boats utilized by the Contractor for this purpose shall be of a size adequate for

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pushing the anticipated load and have necessary reserve power for maneuvering with material barges under emergency conditions as well as for control of material barges at the SMA. Tugs and support boats should be sized to avoid resuspension of sediments.

D. Material Barges.

1. The Contractor shall use wide pocket barges with watertight containment. Markings identifying the draft of the barge shall be clearly provided and maintained on all material barges. Each barge will be used with an ullage table (i.e., displacement table) to provide required information regarding tonnage located in/on the barge. Load barge evenly to maintain the stability of the barge. During sediment removal/loading operations, measure and record on the Daily Report the tonnage of each barge. The tonnage reporting (displacement) will be documented and recorded upon the departure of the barge from the dredge area and upon arrival at the SMA. During the entire period of work, provide and maintain sufficient spot or floodlights, as necessary, to permit the reading of the draft on the sides of material barges at bow and stern from the tow boat when visibility is impaired and at night, as approved by the Engineer. Ensure that adequate time is allowed by the tow boat captain for these readings to be obtained. Include Tonnage Report Logs within the Daily Report.

E. Resuspension Control.

1. The Contractor shall implement resuspension controls in the form of double turbidity curtain configurations, oil booms and dredging BMPs as required in Section 015719 – Temporary Environmental Controls and Protection.

F. Lights.

1. The Contractor shall provide lights for floating equipment and material barges during periods of restricted visibility. Lights must also be provided for buoys, resuspension controls, or other activity markers that could endanger or obstruct navigation. Lights shall be provided for equipment being used to perform the Work, even when not in use.
2. The Contractor shall provide lights for work that is approved during non-daylight hours, as defined by 30 minutes before sunset and 30 minutes after sunrise. This will consist of providing, installing, operating, maintaining, moving, and removing portable light towers and equipment-mounted lighting fixtures for the duration of all dredging activities occurring during non-daylight hours.

PART 3 – EXECUTION

3.01 ORDER OF WORK

- A. The Contractor shall install the replacement salt water fire main pipeline on shoreline property outside of the remediation area to replace the existing underwater salt water fire main shown on the Contract Drawings.
- B. Unless otherwise approved, the Contractor shall complete dredging operations in a single SMU before advancing to an adjacent SMU.
- C. Dredging operations in the immediate vicinity of the drydock shall be coordinated with the Owner to minimize impact to shipyard operations. Dredging in this area shall not be permitted until the currently docked vessel *USS Essex* has undocked and dredging operations in this area have been approved by the Owner.
- D. If high spots remain above the required dredge elevations and grades following the review of a progress survey, the Contractor shall immediately initiate corrective action to remove such high spots to the satisfaction of the Engineer.

3.02 SURVEYS

- A. Pre- and Post-Dredge Surveys.
 - 1. Contract Drawings.
 - a) The Contract Drawings show the most recent hydrographic survey data that was collected by Environmental Data Solutions (San Rafael, California) utilizing multi-beam bathymetry on April 8-12, 2013.
 - 2. Pre-Dredge Baseline Survey.
 - a) An independent third-party surveyor hired by the Contractor shall conduct a Pre-Dredge Baseline Survey at least 5 working days prior to the start of dredging activities. The survey shall be completed in accordance with Section 017123 – Surveying. The Owner and Engineer shall be notified, in writing, at least 5 working days in advance of baseline survey, and the Owner and Engineer shall be permitted to accompany the survey party and to inspect the data and methods used in preparing the baseline map. This survey will serve as the Pre- Dredge Baseline for the basis of payment.
 - 3. Post-Dredge Survey.

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- a) The Contractor's independent, third-party surveyor shall conduct a survey no later than 2 working days after the completion of all dredging activities at the Site. The survey shall be completed in accordance with Section 017123 – Surveying. The Owner and Engineer shall be notified, in writing, at least 5 working days in advance of the Post-Dredge Survey, and the Owner and Engineer shall be permitted to accompany the survey party and to inspect the data and methods used in preparing the final assessment and estimate. If the Post-Dredge Survey confirms the area to be at design grade, the Work within that area shall be determined complete. Should the Work be determined to be incomplete, the Contractor shall immediately perform such additional work as may be necessary to satisfactorily complete the Work to the satisfaction of the Owner. Final estimates will be subject to deductions and adjustments to deductions previously made because of excessive overdepth dredging, dredging outside the indicated or authorized areas, or disposal of material in an unauthorized manner.

3.03 CONDUCT OF WORK

A. Layout of Work.

1. The Contractor shall establish an accurate method of horizontal and vertical control and layout work before dredging begins as described in Section 017123 – Surveying. Detail control procedures and monuments in the Survey Plan.

B. Underwater Pipe Relocation.

1. The Contractor shall relocate the underwater salt water fire main in coordination with the Owner prior to initiating dredging.
2. The Contractor shall install permanent replacement pipeline to be placed at shoreline locations at the direction of the Owner. The replacement pipeline shall be connected and functional before any demolition or removal of the existing pipeline is performed.

C. Dredging.

1. The Contractor shall dredge from top of bank, working from higher elevations to lower elevations to maintain a stable slope. Stair-step dredge cuts for steeper slopes shall be implemented to reduce sloughing of sediment.
2. The Contractor shall dredge the dredge prism to the lines, grades, slopes, and elevations shown on the Contract Drawings. Each pass of the dredge bucket shall be complete, and there is to be no stockpiling of sediment in

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the water. Overfilling of the bucket shall not occur. Taking multiple bites shall not occur. Leveling of the completed dredging surface by dragging a beam or the clamshell bucket is not permitted.

3. The Contractor shall release from the dredge material barge is prohibited.
4. The Contractor shall pay particular attention to the conditions of issued regulations and authorizations requiring minimizing turbidity and loss of resuspended sediments during dredging and transport operations and adherence to water quality requirements.
5. The Contractor shall make the cut to the lines and grades shown on the Contract Drawings. No excessive dredging shall be allowed.
6. The Contractor shall verify that dredging adjacent to existing structures is being conducted while maintaining the required offset, as shown on the Contract Drawings. Specific offsets that the Contractor shall be aware of include the following:
 - a) Shoreline Sloped Revetment. The crest of the neatline dredge prism has been designed to be a minimum of 10 feet horizontally from the edge of the sloped revetment. Accordingly, no active dredging operations shall be conducted within 10 feet horizontally of the edge of the sloped revetment.
 - b) Shoreline Vertical Sheetpile Bulkheads. Active dredging operations shall not be conducted within 20 feet horizontally of the shoreline vertical sheetpile bulkheads.
 - c) Drydock Access Pier. Removal of soft sediment adjacent to certain support piles at the Drydock Access Pier has been specified as shown on the Contract Drawings. Contractor shall not position dredge bucket within 5 feet of piling to avoid damage from equipment impact.
 - d) Ways Extensions. Active dredging operations shall not be conducted within 10 feet horizontally from the edge of the extensions in all directions.
 - e) Cyclopean Wall. The dredge prism in the vicinity of the cyclopean wall has been designed so that no more than 6 feet of soft sediment shall be removed adjacent to the face of the wall. Contractor shall not position dredge bucket within 10 feet horizontally of the face of the wall to avoid damage from equipment impact.
7. Upon completion of the Work, but not until acceptance by the Engineer, the Contractor shall promptly remove the dredging plant and associated

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equipment, including ranges, buoys, piles, and other markers or obstructions placed by the Contractor in the water or on shore.

D. Additional Dredging.

1. Following completion of dredging in an individual SMU, or as determined by the Engineer, post-dredging samples shall be collected by the Engineer and shipped to an analytical laboratory to determine compliance with CAO dredging objectives. In the event that sediment chemistry levels are measured in excess of CAO objectives, the Engineer may specify additional dredging beyond the elevations specified on the Contract Drawings. The Engineer shall provide the Contractor dredging areas and cut elevations for the additional dredging work. Additional dredging passes shall be specified as a 2-foot cut over the additional dredging area.
2. Payment for additional dredging shall be as specified in Section 012000 – Price and Payment Procedures.

E. Post-Dredge Sand Cover.

1. Following completion of dredging or additional dredging in an individual SMU, or as determined by the Engineer, post-dredging samples shall be collected by the Engineer and shipped to an analytical laboratory to determine compliance with CAO dredging objectives. In the event that sediment chemistry levels are measured in excess of CAO objectives, the Engineer may specify placement of Cover Material over the previously dredged area(s). Procedures and requirements for Cover Material placement shall be as specified in Section 352026 –Cover Material Placement.

F. Dewatering on Haul Barge.

1. Standard barge loading controls shall be observed including no barge overfilling. The barge shall be loaded so that enough freeboard remains to allow for safe movement of the barge and its material on its planned route. The appropriate draft level shall be marked on the barge hull to aid operators.
2. The bucket shall place the dredged sediment into a wide pocket haul barge.

G. Spill Prevention.

1. Surface booms, oil-absorbent pads, and similar materials shall be kept on-site at all times to be deployed in the event that any sheen may occur on the surface of the water during work.

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2. All oil and fuel shall be housed in a secondary containment structure.
 3. The Contractor shall provide the following training to personnel involved with dredging operations:
 - a) Oil and/or fuel spill hazards, including training on where spill kits are located, how to deploy oil absorbent pads, and proper disposal of waste.
 - b) Dredging equipment operation.
 - c) Silt curtain deployment techniques.
 - d) Proper responses in the event ordnance or munitions are encountered.
 4. Equipment shall be inspected for wear or faulty parts that may contain oil or fuel before starting the shift.
 5. Personnel shall visually monitor for oil or fuel spills during construction activities.
 6. Equipment shall be immediately shut down if a sheen or spill is observed. The source of the spill shall be identified and contained and the spill shall be reported to the applicable authorities.
 7. An oil boom shall be deployed along entire length of outer silt curtain.
 8. Shallow areas along haul route shall be mapped and provided to the dredge operators.
- H. Noise Requirements during Dredging Operations.
1. All equipment utilized for dredging operations shall be affixed with properly functioning mufflers consistent with manufacturer's standards.
 2. All stationary equipment shall be positioned so that noise emission is directed away from sensitive receptors at or near the Site.
 3. Equipment shall be positioned so that the greatest distance practical is observed between noise emission and sensitive receptors at or near the Site.
- I. Stoppage of Work.
1. All Site personnel shall have the authority to stop Work in the event that unsafe conditions are observed.

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2. No work shall be conducted in high winds greater than 25 miles per hour.

3.04 WATER QUALITY MONITORING

- A. The Contractor and the Engineer shall monitor water quality in accordance with the requirements of the applicable regulatory documents. Permits and associated water quality monitoring requirements will be made available to the Contractor as they are received.
- B. The Engineer will monitor water quality at regular occasions using a combination of automated water quality sensors and manual water sample collection. The Contractor shall abide by all Owner-derived direction regarding responding to the results of water quality monitoring.
- C. The Contractor shall have in place:
 1. BMPs to prevent water quality exceedances.
 2. Contingency measures to implement should water quality exceedances occur.

3.05 SALVAGED MATERIAL

- A. Anchors, chains, straps, and other articles or debris brought to the surface during the course of the dredging operations shall remain the property of the Contractor and shall be disposed of at an approved off-site location.
- B. If encountered, hazardous material and waste, consisting of creosote piles, batteries, PCBs, or others, shall be disposed of in accordance with applicable federal, state, and local regulations. Hazardous waste is not anticipated to be encountered as part of this dredging operation. When such material or waste is encountered, the Contractor shall immediately notify the Engineer pursuant to Section 007000 – General Conditions to determine the course of action to be taken.

END OF SECTION

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PART 1 – GENERAL

1.01 SUMMARY

- A. The work consists of furnishing all transportation, labor, materials, equipment, and incidentals necessary for placement of Cover Materials at the San Diego Shipyard Sediment Site (Site) as shown on the Contract Drawings.
- B. Cover work consists of placement of cover materials in underpier areas, designated open water areas or as instructed by the Engineer to address residuals following dredging operations.
- C. Underpier areas shown on the Contract Drawings shall receive Cover Material at a specified material weight per unit area rate.
- D. Designated open water placement areas shown on the Contract Drawings shall receive Cover Material at a specified material weight per unit area rate.
- E. Following dredging operations, the Engineer may specify certain dredged areas to receive Cover Material within designated boundaries and a specified layer thickness.
- F. Cover Material placement operations shall not be performed until approved by the Engineer.

1.02 DEFINITIONS

- A. **Cover Material:** Cover Material is defined as non-contaminated material placed as a material weight per unit area over the Required Cover Extents with a Required Cover Minimum Thickness, as shown on the Contract Drawings. Cover Material takes the form of Sand Cover Material and Gravelly Sand Cover Material, to be placed in various locations as shown and defined on the Contract Drawings. Cover Material shall be obtained from an upland, off-site source, and shall not be a reused dredged material, nor from an in-water source. Cover Material shall meet all acceptance criteria as specified herein.
- B. **Post-dredge Cover Material:** Post-dredged Cover Material is defined as non-contaminated material placed following dredging within designated boundaries at the direction of the Engineer.
- C. **Required Cover Placement Quantity:** The required quantity of cover material to be placed over the Required Cover Extents, as specified in tons per unit area. The required tonnage per unit area is noted on the Contract Drawings and is intended to provide an average coverage of 1 foot throughout the required coverage area. A Required Cover Minimum Thickness shall be met in addition to the Required Cover Placement Quantity to ensure an even distribution of Cover Material over the Required Cover Extents.

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- D. Required Cover Extents: The required cover extents are the horizontal limits to which the Contractor is required to place Cover Material. The required cover extents are shown on the Drawings. The Contractor will not be paid for any cover material placed outside the Required Cover Extents shown on the drawings.
- E. Required Cover Minimum Thickness: The required cover minimum thickness is 6 inches. Completeness and adequacy of coverage will be verified and surveyed in the field by the Engineer, and shall be subject to the Engineer's approval.
- F. Excessive Over-Placement: Any material placed with thicknesses greater than 18 inches above the Required Cover Minimum Thickness (total cover thickness of 24 inches) shall be considered Excessive Over-Placement.

1.03 REFERENCES

- A. ASTM method D422-63 Standard Test Method for Particle-Size Analysis of Soils.
- B. ASTM method D2216-10 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.

1.04 QUALITY ASSURANCE

- A. The Contractor shall provide testing and inspection services, as required. Sampling and testing to ensure compliance with the Contract provisions shall be in accordance with the Construction Quality Control Plan, as described in Section 014500 – Quality Control, and are the Contractor's responsibility. The San Diego Bay Environmental Restoration Fund – South Trust (known as the Owner) reserves the right to require additional testing as deemed necessary by the Engineer.

1.05 JOB CONDITIONS

- A. Character of Materials.
 - 1. The character of the existing sediments within the waterway is described in Section 352023 – Dredging.
- B. Protection of Existing Facilities.
 - 1. Exercise care when conducting cover placement operations so as not to damage, undermine, or otherwise disturb existing facilities or structures. Any damage to existing facilities or structures caused by the Contractor's operations, as determined by the Engineer, shall be repaired at the Contractor's expense.
- C. Protection of Eelgrass Beds, Sea Turtles, and Marine Mammals.

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1. All in-water work shall be temporarily halted if a sea turtle or marine mammal is sighted within 100 meters of the construction zone and resumed only when the sea turtle or marine mammal is safely outside of the perimeter.
 2. Eelgrass beds, as shown on the Contract Drawings and confirmed in the field by a Project Marine Biologist, shall not be disturbed during in-water operations, including but not limited to, anchoring, grounding, and propeller damage.
 3. The Project Marine Biologist will conduct pre-construction eelgrass surveys not more than 30 days prior to commencement of in-water work near eelgrass beds, as shown on the Contract Drawings. A post-construction eelgrass survey will be conducted by the Project Marine Biologist within 30 days of completion of work near eelgrass beds, as shown on the Contract Drawings. The Contractor shall work with the Project Marine Biologist to accommodate the eelgrass surveys described herein.
 4. The Contractor shall maintain a minimum 10-foot buffer around existing eelgrass beds, as shown on the Contract Drawings.
 5. When working within 50 feet of eelgrass beds, the Contractor shall drive posts along the dredge boundary to attach a silt curtain outboard of the posts such that it does not drag over the eelgrass. The Contractor shall place cover material outboard of the curtain working away from the shore in a manner that minimizes the time period that curtains are present.
 6. In the event that eelgrass beds are determined by the Project Marine Biologist to be impacted from the remediation work, the Contractor shall be responsible for mitigation of eelgrass beds in an area approximately 450 feet to the east of the timber pier (to be demolished as part of this Contract). Eelgrass beds will be restored by placing approximately 5 cubic yards of sand at the toe of the existing riprap slope and planting eelgrass.
- D. Control of Pollutants Other Than Sediment.
1. Requirements for control of pollutants as specified in Section 352023 – Dredging are also applicable to cover material placement operations.
- E. Inherent Delays and Shipyard Activities.
1. Anticipate inherent delays while conducting cover material placement operations in the waterway. Shipyard operations within the Site and commercial shipping traffic in nearby waters shall have precedence over the Contractor's activities and will require them to stop, move, adjust,

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and/or slow down to accommodate vessel movement. The bid prices shall include allowances for such inherent delays.

F. Interference with Navigation.

1. Requirements for limiting interference with navigation as specified in Section 352023 – Dredging are also applicable to Cover Material placement operations.

1.06 MISPLACED MATERIAL

- A. Requirements for misplaced materials as specified in Section 352023 – Dredging are also applicable to cover placement operations.

1.07 SUBMITTALS

- A. Cover Material Placement Plan. As part of the RAWP submittal detailed in Section 014000 – Remedial Action Work Plan, Contractor shall submit to the Owner a detailed, written Material Placement Plan, which shall contain the following information:
 1. The order in which the work is to be performed, indicating the work sequence.
 2. Number, types, and capacity of equipment to be used.
 3. Methods and procedures for placing cover materials per these specifications.
 4. Methods and means for monitoring Cover Material placement, including:
 - a) The rate of deposition of the Cover Material at all times.
 - b) The location of placed Cover Material in the project coordinate system.
 - c) The area where Cover Material was placed in the previous day.
 - d) The volume of Cover Material placed during the previous day.
 - e) Average thickness of Cover Material placed during the previous day.
 5. The time and duration required to complete each activity related to cover material placement.
 6. Transportation route and storage location for cover material.

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7. Methods, procedures, and equipment for coordinating and performing progress surveys; layout of the work; and positioning of Cover Material placement equipment.
 8. Notification and procedures to be used for ensuring that construction work related to cover material placement accommodates commercial and Shipyard vessel traffic using the surrounding waters at all times.
- B. Imported Cover Materials Source Report. Concurrent or prior to submittal of the Cover Material Placement Plan, the Contractor shall also submit an Imported Cover Materials Source Report, which shall contain the following information:
1. Names, addresses, maps and contact information for each supplier proposed for cover material(s).
 2. Documentation that proposed supplier(s) are fully permitted and authorized to provide the cover material(s).
 3. Test reports from accredited laboratories that demonstrate the proposed cover material(s) meet all physical and chemical requirements presented in these specifications, as detailed in Section 2.01, below.
 4. Details regarding the samples obtained for the laboratory testing listed above; including source and location of samples; sampling technique; and chain-of-custody forms for the samples.
 5. Written statement from proposed cover material suppliers that there is adequate available quantity to supply the necessary material(s) for use on this project, within the necessary timeframes.
 6. Representative samples of each material proposed for placement, per PART 2 – PRODUCTS.
- C. Cover Material Approval Process.
1. Submittals listed above shall be provided to the Owner, who will then provide review copies to the Engineer.
 2. The Contractor shall not bring any Cover Materials to the Site until approval from the Owner and the Engineer has been received.

PART 2 – PRODUCTS

2.01 COVER MATERIALS CHARACTERIZATION

- A. General.

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1. The Contractor shall ensure that there is an availability of adequate and acceptable materials source, based on quantity, quality, and gradation to complete the cover material placement work. All borrow sources and imported material used by the Contractor shall meet the specifications listed below.
 2. Provide all required materials for the cover material placement work. Materials shall be of the quality, size, shape, and gradation, or equal to that specified herein.
 3. Perform the activities specified below to assure that imported materials are free of contaminants, including debris or recycled materials, and meet construction specifications. The Engineer maintains the right to reject any materials that have been determined to be substandard for any reason. In the event of rejections, it shall be the responsibility of the Contractor to remove all stockpiles of rejected material from the Site at their expense.
- B. Testing, Reporting, and Certification.
1. Test cover materials for the following parameters:
 - a) Grain Size Distribution (ASTM method D422-63).
 - b) In situ Moisture Content (ASTM method D2216).
 2. Metals, semivolatile organics, polychlorinated biphenyls (PCBs), phthalate esters, and other constituents shall be tested using the analysis method and reporting limits shown in Table 1 – Fill Chemical Acceptance Criteria, Laboratory Reporting Limits, and Required Analysis Methods (attached to this Section). Materials shall be deemed acceptable if not detected at the reporting limit. Higher acceptance values will be considered by the Owner and Engineer if detectable concentrations are at background levels.
- C. Inspection of Materials at the Project Site.
1. The Contractor shall visually inspect truckloads or barges of import material upon delivery. Material shall be inspected for the presence of foreign, recycled, or reprocessed material. The Engineer may at any and all times perform an independent inspection. Material may be rejected if identified as substandard or test results show it to be substandard. Material may be segregated for testing based on appearance or odor. Segregated material may be tested according to designated procedures at the Engineer's discretion.

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2.02 SAND COVER MATERIAL

- A. Sand Cover Material shall be free-draining sand from an existing commercial sources or sources approved by the Engineer. Reuse of dredged material will not be allowed as cover material.
- B. The material shall be free of all objectionable coating.
- C. Sand Cover Material shall be sampled and analyzed by the Contractor to demonstrate that the chemical parameters are below the chemical acceptance criteria presented in Table 1 – Fill Chemical Acceptance Criteria, Laboratory Reporting Limits, and Required Analysis Methods (attached to this section). Sand Cover Material that does not meet the chemical acceptance criteria will be rejected by the Engineer.
- D. Material samples shall be submitted to the Engineer no less than 30 days prior to the completion of required dredging activities.
- E. Sand Cover Material shall be graded between the limits specified below:

SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
3/8 inch	100%
U.S. No. 4	95% to 100%
U.S. No. 8	80% to 95%
U.S. No. 16	40% to 70%
U.S. No. 50	3% to 40% <u>20%</u>
U.S. No. 200	0% to 5% (wet screen)

2.03 GRAVELLY SAND COVER MATERIAL

- A. Gravelly Sand Cover Material shall be free-draining, sandy gravel or gravelly sand obtained from an existing commercial source or sources approved by the Engineer. Individual particles shall be free from all objectionable coating. The material shall not contain organic matter in quantities considered objectionable by the Engineer.
- B. Gravelly Sand Cover Material will be tested by the Contractor to demonstrate that results are below the chemical acceptance criteria presented in Table 1 – Fill Chemical Acceptance Criteria (attached to this section). Gravelly Sand Cover Material that does not pass the required criteria will be rejected by the Engineer.
- C. Gravelly Sand Cover Material shall be graded between the limits specified below:

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SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
4 inches	90% to 100%
¾ inch	50% to 75%
U.S. No. 4	35% to 55%
U.S. No. 10	25% to 45%
U.S. No. 40	10% to 25%
U.S. No. 200	0% to 5% (wet screen)

PART 3 – EXECUTION

3.01 QUALITY CONTROL

- A. Execution and documentation of the Contractor’s quality control activities related to this section of the specifications shall be done in accordance with the Contractor's Quality Control Plan, described in Section 014500 – Quality Control.

3.02 ORDER OF WORK

- A. Dredging.
 - 1. Perform dredging work shown on the Contract Drawings in accordance with Section 352023 – Dredging. Following initial dredging operations, the Engineer may specify placement of Sand Cover within designated boundaries which will be provided to the Contractor to address residual sediment.
- B. Post-Dredge Sand Cover Placement.
 - 1. Conduct placement of post-dredge Sand Cover Material to the limits and thicknesses specified by the Engineer.
- C. Gravelly Sand Cover Placement.
 - 1. Conduct placement of Gravelly Sand Cover Material to the limits shown on the Contract Drawings.
- D. Underpier and Open Water Cover Placement.
 - 1. Conduct placement of underpier and open water Sand Cover Material to the limits shown on the Contract Drawings.
- E. Removal of Excessive Over-Placement Material.
 - 1. The Contractor may be required by the engineer to remove any excessive over-placement material.

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3.03 SURVEYS

A. Pre-Cover Survey.

1. The Final Dredging acceptance survey described in Section 352023 – Dredging and Section 017123 – Surveying shall serve as the pre-cover bathymetric survey.

B. Post-Cover Survey.

1. Upon nearing completion for cover placement in the required areas, notify the Engineer at least 5 days prior to completing placement operations, and request that the independent third party surveyor conduct the post-cover acceptance survey as described in Section 017123 - Surveying. If required placement coverages or thicknesses have not been met, as determined by the Engineer, the Contractor shall place additional cover material, and the area(s) will be re-checked by the Engineer.
2. The cover thickness for all cover areas shall be determined by comparison of the independent hydrographic surveys conducted before and after cover placement, in accordance with Section 017123 – Surveying. Response action will be required for all areas with less than 6-inches of cover material.
3. The post-cover acceptance survey will be used as the basis for acceptance of Work and determination of final pay areas. The Engineer, computing placement areas to the nearest square yard, will calculate final pay areas. Upon request, the Contractor will be provided a copy of the bathymetric soundings and the area calculations.

C. Underpier Surveys.

1. Underpier surveys shall be conducted using a single beam sonar system onboard a shallow-draft vessel through each pier bent. Sounding lines shall be spaced no more than 25 feet. The Engineer may supplement underpier cover surveys following completion of underpier cover placement with a third-party dive crew. A third-party dive crew, at the request of the Engineer, shall perform a visual inspection of the placement area and thickness to document placement of material within the placement limits. The Contractor shall accommodate the third-party dive crew as necessary to allow them to accomplish their dive survey in an expeditious fashion, at the direction of the Engineer.

D. Bathymetric Equipment and Methods.

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1. Requirements for bathymetric equipment and methods as specified in Section 017123 – Surveying are also applicable to cover placement operations.

E. Ranges and Tide Gauges.

1. Requirements for ranges and tide gauges as specified in Section 017123 – Surveying are also applicable to cover placement operations.

3.04 CONDUCT OF WORK

A. Layout of Work.

1. Verify that all required gauges, targets, ranges, and other survey markers are in place and properly maintained as described in Section 017123 – Surveying.

B. Positioning Equipment and Methods.

1. Requirements for positioning equipment and methods as specified in Section 352023 – Dredging are also applicable to cover placement operations.

C. Cover Material Placement Equipment.

1. All equipment utilized for Cover Material placement shall be affixed with properly functioning mufflers consistent with manufacturer's standards.
2. All stationary equipment shall be positioned so that noise emission is directed away from sensitive receptors at or near the Site.
3. Equipment shall be positioned so that the greatest distance practical is observed between noise emission and sensitive receptors at or near the Site.

D. Silt curtains shall be positioned to surround the active Work area at all times during placement of cover materials.

E. Surface booms, oil-absorbent pads, and similar materials shall be on Site for any sheen that may occur on the surface of the water during the Work.

F. Water Quality Monitoring.

1. The Contractor and the Engineer shall monitor water quality throughout cover placement operations in accordance with the requirements of the applicable regulatory documents and as described in Section 015719 – Temporary Environmental Controls and Protection.

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2. The Engineer will monitor water quality at regular occasions using a combination of automated water quality sensors and manual water sample collection. The contractor shall abide by all Owner-derived direction regarding responding to the results of water quality monitoring.
3. The Contractor shall have in place:
 - a) BMPs to prevent water quality exceedances.
 - b) Contingency measures to implement should water quality exceedances occur.

G. Placement of Cover Materials.

1. Cover material placement shall not begin until after all dredging is completed. No placement shall occur outside of the in-water construction window of September 17, 2013, through March 31, 2014.
2. Cover material placement shall be accomplished in the designated areas, within the tolerances, and to the depths indicated on the Contract Drawings.
3. Generally, cover materials shall be placed from the bottom of slope, or low point within a given placement area, and progress up the slope or towards the high point within a given placement area.
4. Cover material shall be placed in controlled lifts not to exceed 6-inches. A specific cover placement area shall receive an initial lift of cover materials over the entire placement footprint before the Contractor places subsequent lifts.
5. Contractor shall place the Cover Material in such a manner as to reduce the vertical impact and lateral spreading of Cover Material and potential for resuspending surficial sediments. Controlled placement shall also occur to minimize the mixing of Cover Material and surficial sediment to allow sediment to slowly gain strength before subsequent layers are deposited.
6. Contractor shall minimize the drop height for placement of cover materials to the extent practical in order to limit mixing of the cover materials and the surficial sediments.
7. Use of spuds is not allowed in previously covered areas.
8. The Contractor shall monitor the cover placement work throughout the course of work for depth, slopes, location, and tolerances, and shall be

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responsible for damages due to over-placement or placement outside the given limits for cover materials.

9. The Contractor will not be allowed to drag cover areas to even out cover material overplacements.
10. Any cover material that is deposited other than in the area indicated on the drawings, or other than as approved by the Owner or Engineer, will not be paid for, and the Contractor may be required to remove such misplaced material and deposit it where directed at its own expense.

H. Stoppage of Work.

1. All Site personnel shall have the authority to stop Work in the event that unsafe conditions are observed.
2. No work shall be conducted in high winds greater than 25 miles per hour.

END OF SECTION

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TABLE 1
FILL CHEMICAL ACCEPTANCE CRITERIA, LABORATORY REPORTING LIMITS, AND
PREFERRED ANALYSIS METHODS

CAS	CONSTITUENT	PREFERRED ANALYSIS METHODS ¹	REPORTING LIMITS ²	UNITS
Metals				
7440-38-2	Arsenic	6010C	6.8E+00	mg/kg dw
7440-43-9	Cadmium	6010C	2.6E+00	mg/kg dw
7447-47-3	Total Chromium	6010C	1.3E+02	mg/kg dw
7440-50-8	Copper	6010C	4.0E+01	mg/kg dw
7439-92-1	Lead	6010C	1.3E+02	mg/kg dw
7439-97-6	Mercury as Elemental	7471	2.1E-01	mg/kg dw
7440-02-0	Nickel	6010C	--	mg/kg dw
7440-22-4	Silver	6010C	3.1E+00	mg/kg dw
7440-66-6	Zinc	6010C	2.1E+02	mg/kg dw
<i>Miscellaneous</i>				
1336-36-3	Total PCBs	8082	3.0E+01	µg/kg dw
Semivolatile Organic Compounds (SVOCs)				
<i>Aromatic Hydrocarbons</i>				
	Total LPAH ^{3,4}	--	--	µg/kg dw
91-20-3	Naphthalene	8270 and 8270SIM	1.1E+03	µg/kg dw
208-96-8	Acenaphthylene	8270 and 8270SIM	6.5E+02	µg/kg dw
83-32-9	Acenaphthene	8270 and 8270SIM	2.5E+02	µg/kg dw
86-73-7	Fluorene	8270 and 8270SIM	2.7E+02	µg/kg dw
85-01-8	Phenanthrene	8270 and 8270SIM	7.5E+02	µg/kg dw
120-12-7	Anthracene	8270 and 8270SIM	4.8E+02	µg/kg dw
91-57-6	2-Methylnaphthalene	8270 and 8270SIM	3.4E+02	µg/kg dw
	Total HPAH ^{3,5}	--	--	µg/kg dw
206-44-0	Fluoranthene	8270 and 8270SIM	8.5E+02	µg/kg dw
129-00-0	Pyrene	8270 and 8270SIM	1.3E+03	µg/kg dw
56-55-3	Benzo(a)anthracene	8270 and 8270SIM	6.5E+02	µg/kg dw
218-01-9	Chrysene	8270 and 8270SIM	7.0E+02	µg/kg dw
--	Total benzofluoranthenes ^{3,6}	--	--	µg/kg dw
50-32-8	Benzo(a)pyrene	8270 and 8270SIM	8.0E+02	µg/kg dw
193-39-5	Indeno(1,2,3-cd)pyrene	8270 and 8270SIM	3.0E+02	µg/kg dw
53-70-3	Dibenz(a,h)anthracene	8270 and 8270SIM	1.2E+02	µg/kg dw
191-24-2	Benzo(g,h,i)perylene	8270 and 8270SIM	3.4E+02	µg/kg dw
95-50-1	1,2-Dichlorobenzene	8270 and 8270SIM	1.8E+01	µg/kg dw
106-46-7	1,4-Dichlorobenzene	8270 and 8270SIM	5.5E+01	µg/kg dw
118-74-1	Hexachlorobenzene	8081	1.1E+01	µg/kg dw
120-82-1	1,2,4-trichlorobenzene	8270 and 8270SIM	1.6E+01	ug/kg dw

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CAS	CONSTITUENT	PREFERRED ANALYSIS METHODS ¹	REPORTING LIMITS ²	UNITS
<i>Phthalate Esters</i>				
131-11-3	Dimethyl phthalate	8270 and 8270SIM	3.6E+01	µg/kg dw
84-66-2	Diethyl phthalate	8270 and 8270SIM	1.0E+02	µg/kg dw
84-74-2	Di-n-butylphthalate	8270 and 8270SIM	7.0E+02	µg/kg dw
85-68-7	Butylbenzyl phthalate	8270 and 8270SIM	3.2E+01	µg/kg dw
117-81-7	Bis(2-ethylhexyl)phthalate	8270 and 8270SIM	6.5E+02	µg/kg dw
117-84-0	Di-n-octyl phthalate	8270 and 8270SIM	3.1E+03	ug/kg dw
<i>Ionizable Organic Compounds</i>				
108-95-2	Phenol	8270 and 8270SIM	2.1E+02	µg/kg dw
95-48-7	2-Methylphenol	8270 and 8270SIM	3.2E+01	µg/kg dw
106-44-5	4-Methylphenol	8270 and 8270SIM	3.4E+02	µg/kg dw
105-67-9	2,4-Dimethylphenol	8270 and 8270SIM	1.5E+01	µg/kg dw
87-86-5	Pentachlorophenol	8270 and 8270SIM	1.8E+02	µg/kg dw
100-51-6	Benzyl alcohol	8270 and 8270SIM	2.9E+01	µg/kg dw
65-85-0	Benzoic acid	8270 and 8270SIM	3.3E+02	ug/kg dw
<i>Miscellaneous</i>				
132-64-9	Dibenzofuran	8270 and 8270SIM	2.7E+02	µg/kg dw
87-68-3	Hexachlorobutadiene	8081	5.5E+00	µg/kg dw
86-30-6	N-nitrosodiphenylamine	8270 and 8270SIM	1.4E+01	µg/kg dw
--	Grain Size	PSEP—Sieve/Pipette	--	--

Notes:

-- No criteria available.

- 1 Preferred analysis methods have been selected based on known or suspected properties of material to be analyzed and acceptance of the method by EPA among other factors. The laboratory may, at its discretion, choose to use an alternative method approved under SW-846 if properties of the material or laboratory methods indicate that another method is more appropriate.
- 2 If the laboratory is capable of achieving lower limits, the laboratory may negotiate an alternative reporting limit prior to completing analysis.
- 3 Sums shall be calculated and reported to two significant figures.
- 4 Total LPAH is sum of: acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene.
- 5 Total HPAH is sum of: fluoranthene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and
- 6 Total benzofluoranthenes is sum of: benzo(b)fluoranthene, benzo(k)fluoranthene, and benzo(j)fluoranthene, if available.

Abbreviations:

dw = dry weight

HPAH = Higher molecular weight polycyclic aromatic hydrocarbons

LPAH = Lower molecular weight polycyclic aromatic hydrocarbons

PCBs = polychlorinated biphenyls

PSEP = Puget Sound Estuary Program

SIM = Simultaneous ion monitoring

EPA = U.S. Environmental Protection Agency

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PART 1 – GENERAL

1.01 DESCRIPTION OF THE WORK

- A. The Work includes all equipment, materials, and labor required for preparing the on-site Sediment Management Area (SMA) for offloading dredged material, managing sediment, and transferring sediment to haul trucks for off-site disposal as well as returning the SMA to its pre-existing conditions at the conclusion of the Work. The SMA limits shown on the Contract Drawings shall serve as the limits of available area for sediment and water management and Contractor staging activities.
- B. The Work includes management of water generated during sediment offloading, stockpiling, and management activities. The Contractor may elect to locate water management facilities on a floating barge(s) in order to maximize the SMA area left available for sediment handling and management. Use of and makeup of such offshore facilities are subject to approval by the San Diego Bay Restoration Fund – South Trust (South Trust; known as the Owner) and applicable governing agencies.
- C. The Work includes establishing temporary facilities required for sediment management and within the SMA, throughout the Contract duration or until final completion as determined by the Owner. Temporary facilities include, but are not limited to, electrical power, water supply, telephone service, sanitary facilities, field office, storage sheds, and signs. Disposal work includes furnishing all labor, tools, equipment, and incidentals required for transport and recycling or disposal of site demolition and deconstruction materials and debris, dredged material, and associated debris to an off-site disposal facility.
- D. Water Management and Water Treatment.
 - 1. The Work includes continuous collection and removal of dredge water from dredged material barges, treatment of dredge water through an Active Treatment System (ATS) if used; and discharge of treated water to the approved sewer utility connection. Water discharges must meet all water quality discharge requirements and limitations on the discharge flow rate based on time of day and weather conditions, as described further in this Section. Water management discussed herein also includes:
 - a) Surface water runoff collected from within the limits of the SMA as detailed on the Contract Drawings.
 - b) Surface water runoff collected from sediment and debris stockpiles.
 - c) Fluids associated with equipment washing and equipment decontamination work.

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2. The Contractor shall design, install, operate, and maintain an ATS as described further in this Section. The ATS will be operated as necessary throughout the Work to collect, treat, and discharge dredge water and project-generated water described herein. The ATS and associated water management system components can be located on a barge and/or within the SMA available to the Contractor.
3. The Contractor can use power that is provided on site by the Owner. The Contractor shall coordinate power supply needs for the ATS with the Owner. The Contractor shall determine if an adequate power source is available on site or alternatively can provide power through Contractor-supplied generators.
4. The Contractor shall provide means to contain any leaks or overflows from treatment or conveyance processes and prevent contaminated water from infiltrating into the site soil and from entering surface waters.
5. The Owner will acquire the permit for discharge into the approved sewer utility. ~~The Contractor is responsible for all a~~ Associated discharge costs will be charged directly to the Owner by the City.

1.02 REFERENCES

- A. Private Aids to Navigation set forth in the U.S. Coast Guard (USCG) Code of Federal Regulations (CFR), Title 33, Chapter 1, Parts 64 and 66.

1.03 SUBMITTALS

- A. Sediment Handling and Management Plan.

A draft Sediment Handling and Management Plan (SHMP) describing best management practices (BMPs) for sediment offloading, transport, dewatering, and disposal operations will be developed by the Owner and Engineer prior to construction for submittal to the San Diego Regional Water Quality Control Board (Water Board). The Contractor shall review, modify, and augment the draft SHMP to incorporate into the Contractor's proposed Remedial Action Work Plan (RAWP) and accept for implementation of the Work. The final SHMP to be prepared by the Contractor shall describe, in detail, methods, procedures, and equipment to be used for the following:

1. Preparing the SMA and adjacent shoreline area for sediment offloading activity.
2. Transporting sediments to a point alongside the SMA where they are ready for offloading; including procedures for preventing release of water from dredged material barges during this transportation step.

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3. Offloading sediment and incidental debris to the SMA.
4. Stockpiling and dewatering sediment within the SMA in preparation for off-site transport, including any treatment or additives planned for the sediment.
5. Defining operations, stockpile locations, equipment, and temporary Contractor facilities (such as field offices,) at the SMA, including a text description and sketch of the SMA with handling and processing areas, water collection, erosion controls, truck wheel wash area, exclusion zone, haul roads, fences, and other features.
6. Preventing and capturing spillage during rehandling and transport of sediment, including spill prevention apron.
7. Preventing untreated sediment and effluent release from the SMA into receiving waters.
8. Preventing loss of sediment or associated water during stockpiling and rehandling within the SMA.
9. Providing for SMA site security and establishing stable ingress/egress locations for vehicular traffic.
10. Protecting existing facilities against damage, including description of anticipated loads on docks and how the Contractor will determine that load restrictions are observed.
11. Segregating, handling, transporting and disposing debris to an appropriate disposal facility in accordance with applicable regulations.
12. Storing and handling additives if used for stabilizing sediments prior to hauling off site, include Material Safety Data Sheets (MSDS) for all chemicals used.
13. Providing a dust control and monitoring plan for implementation during sediment staging, if necessary.
14. Cleaning and returning the SMA to its previous conditions prior to the start of construction activities.
15. Estimated hours and days of operation, number of trucks per day, and on-site traffic control measures.
16. Identifying all subcontractors to be employed in transportation, including types of trucks, containers, and liners to be used; inspection procedures prior to transport; and BMPs to prevent any leakage or spillage.

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17. Preparing “Cradle to Grave” documentation of all wastes generated at the San Diego Shipyard Sediment Site (Site).
18. Handling hazardous waste if encountered during dredging, including details on the handling, processing, removal, and disposal of hazardous waste.
19. Depicting on-site transport equipment; equipment, methods, and locations for storing contaminated materials; handling and treatment steps; and off-site transport equipment.

B. Hazardous Materials Transportation Plan.

1. A draft Hazardous Materials Transportation Plan (HMTP) describing the sediment containment and emergency notification procedures will be developed by the Owner and Engineer prior to construction for submittal to the Water Board. The Contractor shall review, modify, and augment the draft HMTP to incorporate into the Contractor’s proposed RAWP and accept for implementation of the Work. The final HMTP to be prepared by the Contractor shall comply with applicable federal, state, and local hazardous waste regulations and include the following items:
 - a) Potential hazardous wastes associated with the Work.
 - b) Location means and methods for storing waste prior to transportation.
 - c) Names and qualifications for each subcontractor that will be transporting, storing, treating, and disposing of the waste, the facility location, phone number, and name of the 24-hour point of contact shall be included. Two copies of the U.S. Environmental Protection Agency (USEPA), state, and local hazardous waste permit applications, permits, and USEPA identification numbers.
 - d) Names and qualifications (experience and training) of personnel who will be working on-site with hazardous waste.
 - e) Methods used to protect works from exposure to hazardous materials.
 - f) Emergency notification procedures.

C. Traffic Control Plan.

1. The Traffic Control Plan will be developed by the Owner and Engineer prior to construction. The Traffic Control Plan shall be reviewed and modified by the Contractor to accommodate the Contractor’s proposed

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RAWP and accepted by the Contractor for implementation of the Work. The Traffic Control Plan shall include:

- a) Planned haul routes, as shown on the Contract Drawings.
- b) Haul truck escorts, if necessary.
- c) Procedures to follow in event of an accidental spillage.
 - 1) Emergency vehicle access.
 - 2) Sediment containment or removal.

D. Water Management and Treatment Plan.

1. As part of the RAWP submittal, the Water Management and Treatment Plan (WMTP) shall contain the following information at a minimum:
 - a) Methods, procedures, and equipment to be used for the following activities:
 - 1) Dredge water removal from dredged material barges.
 - 2) Management and treatment of dredge water and other project-generated water.
 - 3) Treated water discharge, including testing and documentation of treated water prior to discharge to the approved sewer utilities.
 - 4) Management of recovered dredged material resulting from water management and treatment; material subject to the SHMP, above.
 - b) All elements of the Active Treatment System (ATS) Plan, if used, in accordance with Paragraph 3.08 of this Section.
 - c) Design parameters and treatment production calculations for the water management and treatment system.
 - d) Location and configuration of proposed water management and treatment system elements within the SMA boundary and/or on barge(s).
 - e) List of proposed equipment, including make and model, storage capacity, piping diagram, throttle valves, sampling

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ports/vessels/wells, flow meter, flow rates for pumps, and carbon vessel, if necessary.

- f) Operator qualifications and applicable certifications for water treatment system.
- g) Procedure for verifying that effluent discharged from the water management and treatment system to the specified discharge location will achieve water quality criteria required by project permits, in accordance with the process provided in Paragraph 3.03 of this Section.
- h) Proof of Treatment testing procedures and details of system commissioning.
- i) Method(s) and BMPs to limit, to the degree reasonably possible, dredge water retained in the dredged material barge. The use of an enclosed environmental bucket in combination with dredge cuts on slopes will result in considerable dredge water volume in the dredge bucket that is subsequently placed in the dredge material barge.

E. Submittals During Construction.

1. Daily Disposal Reports shall be submitted to the Engineer for all dredged material and debris transferred to approved disposal or recycling facilities. Daily Disposal Reports shall include the total number of truckloads, total estimated volume, total tons of material received at the designated disposal facility, a copy of the completed waste disposal tracking sheets, and receipt copies of waste shipment records at the designated disposal facility received that day.
2. All transportation-related shipping documents shall be submitted to the Engineer, including draft manifests for waste, draft bills of lading, and lists of proposed labels, packages, markings, and placards to be used for shipment. Generator copies of manifests used for initiating shipments of waste, bill of ladings, and supporting waste analysis documents shall be furnished when shipments are originated. The Engineer shall sign nonhazardous shipping papers and manifests.
3. Daily water discharge reports shall be submitted to the Engineer for all managed water. Daily reports shall include the volume of water discharged to the approved sewer utilities and the maximum instantaneous flow.
4. Weekly water discharge reports shall be submitted to the Engineer for all managed water. Weekly Reports shall include the volume of water

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discharged to the approved sewer utilities. For the purpose of this submittal, the week shall begin on Monday at midnight.

5. All permit-required records and submittals.
6. Any changes made to the approved SHMP, HWMP, and WMTP during construction; changes may include, but are not limited to: layout, operations, operator, use of additives, discharge location, etc. Changes to the approved SHMP, HWMP, and WMTP require prior approval by the Engineer.

PART 2 – PRODUCTS

2.01 GENERAL

- A. All facilities shall be compliant with Occupation of Safety and Health Administration (OSHA) and fire protection codes.
- B. The Contractor shall provide documentation that equipment and materials (e.g., paints and solvents) are compliant with Title V and airborne toxic control measures (ATCMs) prior to entering the Site.

2.02 WATER

- A. Fresh drinking water for employees shall be provided by the Contractor near sanitary containers. The Contractor shall make arrangements with the Owner to obtain, meter, and pay for drinking water and construction water for the duration of the Contract.
- B. All such connections and fittings shall be furnished, installed, and removed upon completion of the Work by the Contractor to the satisfaction of the Owner.

2.03 CONSTRUCTION ELECTRICITY

- A. The Contractor shall use electric power supplied on site by the Owner. The Contractor shall make all arrangements with the Owner for connection to, metering, and payment of electric power for construction purposes.

2.04 TOILET ROOM FACILITIES

- A. The Contractor shall install and maintain necessary temporary sanitary toilet facilities with hand washing facilities throughout the term of the Contract. All toilet facilities shall be regularly maintained in a sanitary condition. Toilets shall be of a chemical type and removed at completion of work, with the premises disinfected.

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2.05 COMMUNICATIONS

- A. The Contractor shall install and maintain the appropriate equipment to allow for the efficient communication via voice and the internet with the Owner and with outside parties at all times during the term of the contract. The Contractor shall then remove the equipment at completion of work. All accounts shall be registered in the name of the Contractor.

2.06 FIELD OFFICES AND SHEDS

A. Contractor's Office Trailer.

1. The Contractor shall install and maintain necessary field office space during the Work and remove it at the completion of the Work.

B. Engineer's Field Office.

1. The Contractor shall provide a secure field office suitable for use by the Engineer. The field office shall be for the exclusive use of the Engineer and Owner personnel. The location of the Engineer's field office shall be subject to the approval of the Owner prior to placement.
2. The Contractor shall equip the field office with the following for the entire duration of the Work, and maintain as needed:
- a) Office furniture including two 5-foot office desks with three drawers each, two office-type chairs, one layout table of 2.5 by 5 feet, one drafting table of 3 by 6 feet with stool, one four-drawer lockable metal filing cabinet, shelves, one bulletin board, and three additional chairs.
 - b) Power, light, ventilation, air conditioning, security barred windows, fire extinguisher, first aid kit, and heat. The Contractor shall obtain electric power from the Owner.
 - c) One phone line with DSL capability or one phone line with high speed internet cable service.
 - d) A functioning touch-tone telephone with hands-free capability and voice messaging.
 - e) A printer/scanner/copy machine compatible with personal computers.
 - f) Bottled water service or access to potable water through coordination of water services with the Owner.

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- g) Janitorial services on a regular basis of at least twice per week to clean the field offices
 - h) Three sets of keys providing access to the vandal-proof field office door lock.
- 3. The Contractor's personnel will not be allowed use of the telephone in the Engineer's field office.
 - 4. Sanitary facilities and hand washing facilities shall be located nearby.
 - 5. Hook-up fees and monthly costs for local office phone and upkeep shall be included in appropriate bid item as part of Contractor's project overhead.

2.07 WATER TREATMENT ADDITIVES

- A. The ATS may incorporate the use of additives for water treatment purposes. Additives for water treatment shall meet the ATS requirements described further in this Section, in addition to discharge permit requirements, and applicable federal, state, and local regulations.
- B. Additives shall be properly labeled, containerized, and contained in accordance with manufacturer recommendations and local, state, and federal regulations; all additives shall be accompanied by manufacturer-supplied MSDS.

PART 3 – EXECUTION

3.01 DESIGN AND PREPARATION OF SEDIMENT MANAGEMENT AREA

- A. General.
 - 1. The Contractor shall review site conditions and factors that affect sediment handling and management, including adjacent properties and public facilities that may be affected by execution of the Work.
 - 2. The Contractor shall furnish, install, and maintain suitable barriers (e.g., fencing) around the perimeter of the SMA as required to prevent public entry and to protect the Work and existing facilities, roadways, and vegetation from construction operations. The Contractor shall remove all such items when no longer needed, or upon completion of the Work.
 - 3. The Contractor shall install temporary erosion and sediment control features to prevent runoff from the dewatered sediment from entering adjacent surface water body. The need for these features, and their location, shall be determined during construction, based on the actual location of the offloading and temporary stockpile areas.

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4. The Contractor shall use temporary erosion and sediment control features between all potential sources of runoff and adjacent surface water bodies where the surface water is downslope of the offloading and temporary stockpile areas.
5. The Contractor shall enclose the dewatering and stockpiling area with a suitable barrier (e.g., “Ecology” blocks, K-rails, or similar method) that contains decanted water and stormwater within the dewatering and stockpiling area and prevents water from flowing into San Diego Bay or into the underlying ground. If a low permeability liner (i.e., visqueen or similar geomembrane) is used as part of the dewatering pad, the Contractor shall install a layer of sand or gravel to provide a visual indicator of the location of the liner to prevent a breach in the dewatering pad.
6. The Contractor shall use secondary containment for storage of oil or fuel at the SMA.

3.02 RESTRICTIONS ON CONSTRUCTION ACTIVITIES

A. Equipment Requirements.

1. The Contractor shall verify stability of seawall along SMA based on planned equipment usage.
2. The Contractor shall adhere to the diesel equipment requirements at the South Shipyard, including, but not limited to the following:
 - a) Operators of all diesel equipment shall:
 - 1) Use fuel meeting the applicable Air Resources Board (CARB) standards under 13 California Code of Regulations (CCR) 2285 and 2282 (e.g., “CARB Diesel”).
 - 2) Comply with applicable state and local regulations controlling diesel engines, including prohibitions against visible emissions and anti-idling regulations.
 - b) Operators of heavy duty diesel trucks and self-propelled off road diesel equipment (e.g., forklifts, loaders, mobile cranes, and other construction equipment) shall:
 - 1) Operate in compliance with applicable CARB regulations for mobile diesel equipment (13 CCR Parts 2449 or 2025).

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- 2) Display a CARB-assigned “Equipment Identification Number” label on off-road equipment as required by 13 CCR Part 2449(f).
- c) Operators of portable diesel equipment (e.g., compressors, generators, pumps, and other diesel equipment that is towable, skid-mounted, or otherwise meets the definition of portability under 13 CCR 2452) shall:
- 1) Display a current (unexpired) Portable Equipment Registration issued by CARB or a Certificate of Registration or Permit issued by the San Diego Air Pollution Control District unless specifically exempt from the requirement to obtain such a registration or Permit. The operator is solely responsible for any costs related to obtaining and complying with the permit.
 - 2) When bringing portable diesel equipment into the South Shipyard:
 - Provide a copy of the registration document to Environmental Engineering prior to bringing the equipment into the South Shipyard.
 - Ensure that portable diesel equipment (greater than 49 horsepower) meets USEPA Tier 2 (or better) engine certification standards for non-road engines.
 - Comply with South Shipyard Environmental Instruction No. 9 “Environmental Requirements for Operating Non-Road Diesel Engines,” including the requirement to submit monthly diesel usage records to Environmental Engineering. For more information, see <http://www.nassco.com/purchasing/environmental-procedures.html>.
 - 3) When operating portable diesel equipment on State Territorial Waters:
 - Ensure that operation on State Territorial Waters is not prohibited in the applicable air pollution control permit or registration.
 - Obtain required authorization from the San Diego Air Pollution Control District for diesel equipment registered under the CARB Portable Equipment

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Registration program at least 15 days prior to the start of the project when required.

- 4) Operators of diesel-fueled vessels meeting the definition of commercial harbor craft shall comply with the applicable provisions of the Airborne Toxic Control Measures for Commercial Harborcraft established under CCR 17 93118.5.
3. The Contractor shall ensure that all diesel-powered equipment used is retrofitted with after-treatment products (e.g., engine catalysts) to the extent that they are readily available in the San Diego Air Basin (SDAB).
4. The Contractor shall ensure that all heavy-duty diesel-powered equipment operating and refueling at the Site use low oxides of nitrogen (NO_x) diesel fuel to the extent that it is readily available and cost effective (up to 125 percent of the cost of CARB diesel) in the SDAB.
5. The Contractor shall ensure that alternative fuel construction equipment (i.e., compressed natural gas, liquid petroleum gas, and unleaded gasoline) are used to the extent that the equipment is readily available and cost effective in the SDAB.
6. The Contractor shall ensure that construction equipment engines are maintained in good condition and in proper tune per manufacturer's specification for the duration of construction.
7. The Contractor shall ensure that construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment is turned off when not in use for more than 5 minutes.
8. The Contractor shall use electricity infrastructure within the Site rather than electrical generators powered by internal combustion engines to the extent feasible.
9. The Contractor shall use alternative-fueled construction equipment to the maximum extent feasible. All diesel-powered construction equipment shall meet or exceed Tier III standards, or shall be equipped with ARB-verified oxidation catalysts and diesel particulate filter emission controls, using the greatest control efficiency for the specific category of equipment where feasible. The Contractor shall demonstrate that these verified/certified technologies are available to be used at the time of project dredging and dewatering activities.

B. Personnel Transportation Requirements.

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1. The Contractor shall plan activities to not interfere with peak-hour traffic and to minimize obstruction of through traffic lanes adjacent to the SMA. If necessary, a flag person shall be used by the Contractor to maintain safe vehicle transportation.
2. The Contractor shall support and encourage ridesharing and transit incentives for the construction crew.
3. The Contractor shall limit on-site vehicle speed to 5 miles per hour (mph).

C. Noise Requirements.

1. The Contractor shall ensure all construction equipment, fixed or mobile, offloading sediment or operating at the SMA, is equipped with properly operating and maintained mufflers consistent with manufacturers' standards.
2. The Contractor shall place all stationary construction equipment to direct emitted noise away from sensitive receptors nearest the Site.
3. The Contractor shall stage all equipment to create the greatest distance between construction-related noise sources and noise-sensitive receptors nearest the Site.
4. The Contractor shall meet all noise restrictions requirements in project permits and City of San Diego ordinances.

D. Dust and Odor Requirements.

1. The Contractor shall adhere to San Diego Air Pollution Control District (APCD) Rule 55 to ensure that all dewatered sediment in the dewatering area/stockpile and loaded on trucks is sufficiently watered to prevent airborne dust from being visible beyond the property line. Water shall be applied to stockpiles, inactive construction areas, and construction roads, as necessary.
2. The Contractor shall adhere to San Diego APCD Rule 55 to ensure that all material transported off site is either sufficiently wet or covered to prevent excessive amounts of dust. Visible roadway dust from carry-out shall be minimized.
3. No work shall be conducted in high winds greater than 25 mph.
4. The Contractor shall apply a mixture of Simple Green and water (a ratio of 10:1) to dredged material to accelerate decomposition and reduce odor impacts if odor issues associated with dredged material occur.

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E. Working Hours Requirements.

1. The Contractor shall prohibit truck haul activity between the hours of 7 pm and 7 am or on Sundays and holidays, except within the active shipyard.
2. The Contractor shall prohibit vehicle movement for 15 minutes during two change-of-shift times from Monday through Friday: 3:00 PM to 3:15 PM and 12:30 AM to 12:45 AM.

3.03 USE OF SEDIMENT MANAGEMENT AREA

A. The Contractor shall provide all necessary work to access, construct, operate, and maintain the SMA. Access to the SMA shall comply with requirements of these Technical Specifications and requirements of the Owner, National Steel and Shipbuilding Company (NASSCO), and, as applicable, the U.S. Department of the Navy (the owner of the land on which the SMA is located). The Contractor shall set up subareas within the SMA for the following items:

1. Dredged material to be handled, processed, and stockpiling for off-site transport and disposal.
2. Debris removed from within the allowable Dredging Limits as shown on the Contract Drawings to be transported off-site for recycling or disposal.
3. In the event that material characterization testing indicates hazardous material, provide separate stockpile areas for hazardous and non-hazardous materials.
4. A water collection sump to collect dewatering effluent and stormwater that falls on the footprint of the SMA. All project-generated water shall be managed in accordance with permit requirements prior to discharge to the approved sewer utility.
5. Equipment staging area(s) including placement of sediment offloading equipment, equipment storage location, and equipment decontamination area.
6. Sediment offhauling area including truck staging location, truck wheel wash, and truck turnout.
7. Employee parking. Employee parking will be confined to the limits of the SMA. No parking is available on adjoining surface streets or within the shipyard.

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8. Worker decontamination area including portable buckets/bins for washing gloves, hard hats, and boots and properly labeled containers for discarding disposable items, as detailed in the site-specific Health and Safety Plan.
 9. An exclusion zone shall be set up by the Contractor prior to the start of the Work.
- B. The Contractor shall provide all labor, equipment, and materials to load, transport, and properly store collected water prior to characterization for discharge. The Contractor shall be responsible for all water handling associated with the SMA operation, including the collection, containerization, and approved discharge of collected dewatered sediment effluent, stormwater, and other aqueous related construction products produced or located within the confines of the SMA.
- C. The Contractor shall be responsible for storing and treating (as necessary) all project-generated water to meet water quality criteria required by project permits. The Owner will perform applicable testing of water to be discharged. The Contractor shall follow the water discharge approval process provided below:
1. The Contractor shall notify the Owner or Engineer when water has been sufficiently treated for testing.
 2. All compliance testing and reporting required by the discharge permit or permitting authorities shall be the responsibility of the Owner. The Owner or Engineer will collect water samples (frequency to be finalized with City of San Diego with permit) and submit the samples for analysis.
 3. The Owner or Engineer will notify Contractor when effluent may be discharged.
 4. The Contractor shall discharge water in accordance with permit requirements upon notification from the Owner or Engineer.
- D. The Contractor shall mobilize and demobilize labor and equipment from the Site, as needed, to move dredged materials from the Site to the appropriate disposal facility approved by the Owner.
- E. Any damage to the seawall or existing facilities caused by the Contractor's operations, as determined by the Engineer, shall immediately be repaired to the pre-project condition at the Contractor's expense.
- F. During dewatering operations, the Contractor shall comply with all requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities.

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- G. Contractor shall also be compliant with all other applicable regulation governing operations at the SMA, including, but not limited to, the following:
1. Permit Registration Documents.
 2. Notice of Intent.
 3. Storm Water Pollution Prevention Plan (SWPPP) prepared in accordance with California state regulations governing the development of a SWPPP.
- H. At least 7 days prior to the start of dewatering operations at the Site, the Contractor shall provide a signed certification statement to the State Water Resources Control Board via the Storm Water Multi-Application and Report Tracking System (SMARTS). Dewatering operations shall not commence until a Waste Discharger Identification (WDID) number is obtained from SMARTS.
1. Contractor shall comply with all fees, reporting and completion verification requirements of SMARTS.
- I. Stockpiling shall be allowed only within the SMA boundary as identified on the Contract Drawings and shall be maintained according to the following provisions:
1. The Contractor shall maintain stockpiles to prevent fugitive dust and other nuisances. Alternative control methods, including covering the stockpiles, may be used provided they are protective of water quality and human health.
 2. The Contractor shall remove water within the stockpile area by pumping to the water management and treatment system. The Contractor shall be responsible for properly disposing of water collected within stockpile areas as described herein.
 3. Install and maintain legible signs at conspicuous locations immediately adjacent to all stockpiled material clearly indicating the nature of stockpile material.
 4. Load trucks within the SMA so that spoils are contained within the area. If required by the Engineer, spread polyethylene sheeting or geotextile over an area sufficient for truck loading to avoid contaminating the loading site. Spilled material shall be immediately picked up and deposited in the appropriate stockpile area.
 5. Immediately correct to the satisfaction of the Engineer any deficiencies in stockpiling management noted by the Engineer.

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3.04 HAZARDOUS WASTE MANAGEMENT

- A. Should hazardous wastes be encountered during the Work, the Contractor shall ensure compliance with all Federal, State, and local hazardous waste laws and regulations.
- B. The Contractor shall identify hazardous materials using criteria set forth in 40 CFR 261 and applicable State and local laws, regulations, and ordinances.
- C. The Contractor shall follow requirements of the California Department of Toxic Substances Control for managing hazardous waste, if encountered.
- D. Hazardous waste, if encountered, shall be segregated from other materials in accordance with CCR, Title 22, Division 4.5, Article 12.
- E. The Contractor shall arrange for transport and disposal of hazardous waste in consultation with the Owner and Engineer. The Owner and Engineer must approve of the disposal site for hazardous waste prior to transport.

3.05 SITE MAINTENANCE AND HOUSEKEEPING

- A. The Contractor shall maintain the SMA during its use for the duration of the Work.
- B. The Contractor shall inspect the SMA once per day and include a summary assessment in the Daily Quality Control Report as detailed in Section 014500 – Quality Control. This inspection and associated maintenance activities shall include the following activities:
 - 1. The Contractor shall inspect the asphalt pavement within the SMA to ensure its integrity. Any necessary repairs or replacement shall be implemented immediately and as directed by the Engineer.
 - 2. The Contractor shall maintain the water collection system and stormwater runoff collection sump for the duration of the Contract or as otherwise directed by the Engineer.
 - 3. The Contractor shall allow all stormwater that falls within the SMA boundary to drain to the collection sump within the SMA. Stormwater shall be managed in accordance with permit requirements prior to discharge to the approved sewer utility or approved disposal.
 - 4. The Contractor shall inspect and repair barriers, liners, and erosion control measures daily or as directed by the Engineer.
 - 5. The Contractor shall keep the SMA and all Contractor facilities clean and free from dirt, dust, rubbish and debris at all times. Materials and

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equipment shall be removed from the Site when they are no longer necessary. Before final completion of the Work, the SMA shall be cleared of equipment, unused materials, and dirt, dust and rubbish to present a clean and neat appearance. Disturbed areas shall be restored per the Owner's direction.

6. The Contractor shall provide on-site containers for collection of waste materials, debris, and rubbish. Trash and debris shall be disposed of in compliance with governing codes, ordinances, regulations, and anti-pollution laws.
 - a) Waste materials of any kind shall not be permitted to remain at the Site or adjacent properties. Immediately upon collection of waste materials, they shall be transported off site and disposed of properly by the Contractor.
 - b) In the event that waste material, refuse, debris, or rubbish is not adequately removed from the Site by the Contractor, the Owner reserves the right to have such material removed and the expense of the removal and disposal charged to the Contractor.
7. The Contractor shall handle paints, solvents, and other materials with care to prevent entry of contaminants into storm drains, surface waters, or soils. These materials shall be collected and properly disposed of by the Contractor.

3.06 OFFLOADING OF SEDIMENTS TO THE SEDIMENT MANAGEMENT AREA

- A. The Contractor shall install a spill-prevention apron, ramp, or similar platform to prevent material spillage into San Diego Bay waters during the transfer of dredged material over water to the SMA. The apron shall be underneath the entire arc of the offloading bucket or other device used for offloading work. No transfer can begin until the apron is in place and approved by the Engineer.
 1. Remove any spillage on the apron as soon as practicable and properly dispose of it. Promptly clean up any such spillage.
 2. Design spill plate to convey sediment/spillage to a collection sump on the unloading dock or back into the haul barge.
 3. Filter fabric material shall be placed over the spill plate and between the edges of the barge and unloading dock as secondary containment from spillage entering San Diego Bay.
 4. Thoroughly rinse spill prevention apron between material offloading barges and place on lined unloading dock.

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5. Collect the free water and interstitial water in the dredge material that drains off during the dewatering process in a temporary containment facility that is inspected daily and treated to meet water quality criteria prior to discharge.
 6. Stage pressure washing equipment at the Site to clean sediment from equipment to the collection sump, as necessary.
 7. Contractor shall not move the bucket from the offloading point until the bucket is completely empty to minimize sediment spilling during transfer.
- B. Upon completion of the work, the Contractor shall remove all vestiges of dredged sediments, barrier materials, liner, pump, discharge pipe, and other materials, and clean up the site to the pre-project condition.
- C. The Contractor shall not damage existing structures, fender piles, piers and adjacent facilities, or utilities during barge offloading and SMA operations. Repair, at no additional cost to the Owner, any damage determined by the Engineer to be the result of the Contractor's activities.
- D. The Contractor shall use mechanical stops on the offloading equipment to minimize the risk of damage to protected facilities.

3.07 SEDIMENT MANAGEMENT AND TREATMENT

- A. Prior to shipment off site, sediments shall be dewatered to a point where they pass the Paint Filter Liquid Test. The Owner or Engineer will collect the Paint Filter Liquid Test. The Owner or Engineer will notify the Contractor when sediments have passed the Paint Filter Liquid Test and the sediment can be transported to the disposal facility. Sediments that do not pass this test shall not be hauled off site.
- B. To pass the Paint Filter Liquids Test, the Contractor may elect to mix additives with the sediments to bind available water. The Engineer must approve the use of additives. Only liquid drying agents shall be used to avoid airborne release. The Contractor has sole responsibility for cleanup and/or damage costs related to the use of additives.
1. MSDS sheets for all chemical additives that the Contractor proposes to bring to the Site shall be submitted to the Engineer for approval prior to delivery of such materials to the Site.

3.08 WATER MANAGEMENT

- A. Water management work may be conducted 24 hours a day, 7 days a week as necessary to support the dredge activities.

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- B. The Contractor shall ensure that all water that is removed from, or flows off of, dredged material is not discharged until it is demonstrated to meet the volume and quality requirements pertinent to the discharge point(s). The use of temporary containers or holding tanks for the water may be required and may be located on barges and/or within the SMA.
- C. The Contractor shall design, install, operate, and maintain a water management and treatment system to be operated continuously throughout the project. Water collection and treatment will be required for all dredge water and other project-generating water described herein.
- D. The Contractor shall provide secondary containment for all water treatment chemical storage tanks at the Site.
- E. The Contractor shall operate a water management system to process collected water to comply with water quality criteria.
 - 1. The water management system(s) shall be compatible with the variable nature of dredge water volume generated from dredging operations including variable flow rate, intermittent flow, and widely varying turbidity and suspended sediment concentrations.
 - 2. The water management system(s) shall be of sufficient size to accommodate without delays, water generated during the Contractor's mechanical dredging operations in addition to all other project-generated water, described herein.
 - 3. The water management and treatment system(s) shall incorporate sufficient time for treatment (collected water to clarify in treatment tanks or storage units or other methodology) prior to discharge.
- F. The Contractor shall develop a water management and treatment system(s) that meets the Contractor's operational needs for mechanical dredging that shall, as a minimum, include:
 - 1. Slurry pumps/pipelines to remove free (decanted) water from dredge material barges.
 - 2. Sufficient storage (i.e., holding tanks) capable of containing and treating collected water in quantities such that dredging production shall not be limited by the water management and treatment process, nor the water discharge limits detailed in Section 014126 – Permits.
 - 3. Mixing, settling tanks (may double as holding tanks).
 - 4. Geotextile bags or other alternative water-sediment separation system, as approved by the Engineer during review of the WMTP.

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5. Water processing system, as required so as to not cause an exceedance of water quality requirements detailed in Section 014126 – Permits.
 6. Ability to treat dredge water under variable influent turbidity and total suspended solids (TSS) conditions.
- G. The Contractor shall remove dredge water from the haul barge(s) prior to offloading to limit the amount of water transferred to the stockpile area within the SMA.
1. The Contractor shall provide a holding barge, tanks, or other acceptable methods that provides temporary holding of excess water and settlement of suspended particles from the water or other acceptable method for water treatment. The Contractor shall have suitable methods to efficiently and effectively remove settled material from barge or tanks as appropriate.
- H. The Contractor shall discharge treated water as described below.
1. Following treatment of collected water in accordance with the procedures of the Contractor's WMTP and testing (performed by the Owner or Engineer at a frequency to be finalized with City of San Diego with permit) to determine that the treated water is in compliance with the requirements of the project permits, the Contractor may discharge treated water to approved sewer utilities located at the Site not in exceedance of specified flow rate limitations in addition to all other permit discharge limits.
 2. The sewer utility located within the limits of the SMA at manhole 138 (H24S138), as shown on the Contract Drawings, shall be the primary allowable discharge point for this work.
 3. Treated water discharge to the sewer utility may not exceed 250 gallons per minute during dry weather conditions, as specified in the significant industrial user (SIU) Permit (to be acquired). Treated water shall not be discharged to the sewer utility during a rain event of 0.1 inch or greater and must be held until 24 hours after the last rain; at the option of the Contractor, runoff and dredge water may be stored during this period.
 4. The Contractor is solely responsible for the management of all project-generated waters and will have full responsibility for fines imposed and additional project costs associated with exceeding applicable permit discharge limits.
 5. The Contractor shall be responsible for tracking water flow rate and sampling for the chemical oxygen demand (COD) and TSS as is required

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for payment to the City of San Diego. Information pertaining to billing rates can be found at: <http://www.sandiego.gov/mwwd/rates/index.shtml>.

3.09 ACTIVE TREATMENT SYSTEM (ATS)

- A. The Contractor's water management system may require the use of an ATS to treat dredge water, in order to meet effluent requirements. The use of an ATS may be necessary as a result of the expected large dredge water flow rates, without the need to store and hold dredge water for extended periods of time. The ATS shall use flocculants/coagulants to increase the efficiency of the dredge water sediment settling process. The primary purpose of the ATS is to provide treatment for the dredge water; however, the Contractor can also use the ATS for treatment of other water generated through construction activities within the SMA.
- B. ATS Design, Operation and Submittals.
1. The ATS shall be designed and approved by a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ); a California registered civil engineer; or any other California registered engineer.
 2. Design and operation of the ATS is subject to the conditions of the SIU Permit (to be acquired).
 3. The Contractor shall ensure that the ATS is designed in a manner to preclude the accidental discharge of settled floc during floc pumping or related operations. Floc is defined as a clump of solids formed by the chemical action in ATS systems.
 4. The ATS shall be designed with redundancy to allow for daily removal of sediment from the treatment settling tanks in a manner that allows continued operation of treatment system while the non-active treatment tanks or equipment are being maintained. Sediment accumulation and removal from the treatment settling tanks is a key factor in system performance.
 5. The Contractor shall design outlets to dissipate energy from concentrated flows.
 6. The Contractor shall install and operate an ATS by assigning a lead person (or project manager) who has either a minimum of five years construction stormwater experience or who is a licensed Contractor specifically holding a California Class A Contractors license.
 7. The Contractor shall prepare an ATS Plan that combines site-specific data and treatment system information required to safely and efficiently operate an ATS. The ATS Plan shall be electronically submitted to the Engineer at

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least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation. At a minimum, the ATS Plan shall include:

- a) ATS Operation and Maintenance Manual for All Equipment.
 - b) ATS Monitoring, Sampling, and Reporting Plan, including quality assurance and quality control (QA/QC).
8. The ATS shall be designed to manage and treat the Contractor's dredge decant water, and all other project-generated water the Contractor decides to handle through the ATS. The design flow rate and influent dredge decant water quality characteristics (i.e., turbidity and TSS) shall be determined by the Contractor based on review of available sediment and subsurface information.
9. The Contractor shall be prepared to modify its dredging rate and dredge water decanting process in order to maximize the removal and performance efficiency of the ATS.
- C. Treatment – Chemical Coagulation/Flocculation (if necessary).
1. Jar tests shall be conducted using water samples selected to represent typical site conditions and in accordance with ASTM D2035-08 (2003).
 2. The Contractor shall conduct, at a minimum, six site-specific jar tests (per polymer with one test serving as a control) for each project to determine the proper polymer and dosage levels for its ATS.
 3. Single field jar tests may also be conducted during a project if conditions warrant, for example if dredging activities encounter changing sediment particulate size, which consequently cause change in dredge water turbidity and TSS characteristics.
 4. The following coagulants/flocculants are approved for use on this project.
 - a) FloccClear™ (2 percent chitosan acetate solution).
 - b) ChitoVan™ (1 and 1.5 percent chitosan acetate solution).
 - c) StormKlear™ Liquifloc™ (1 and 3 percent chitosan acetate solution).
 - d) HaloKlear™ Dual Polymer System (DPS).
- D. Residual Chemical Requirements.

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1. The Contractor shall utilize a residual chemical test method that has a method detection limit (MDL) of 10 percent or less than the maximum allowable threshold concentration (MATC) for the specific coagulant in use and for the most sensitive species of the chemical used.
2. The Contractor shall utilize a residual chemical test method that produces a result within one hour of sampling.

E. Filtration.

1. The ATS shall include a filtration step between the coagulant treatment train and the effluent discharge. The filtration step shall consist of a high rate pressurized sand filter system with automatic backwash. The Contractor shall design the ATS to account for backwash flow rates. Backwash shall be discharged to the primary settling tank such that the backwash water is re-treated through the ATS.
2. Differential pressure measurements shall be taken to monitor filter loading and confirm that the final filter stage is functioning properly.

F. Residuals Management.

1. Sediment shall be removed from the storage or treatment tanks daily, or as necessary to ensure that the tanks maintain their required water storage (i.e., volume) capability and the overall ATS performance is maximized. The ATS shall be designed with redundancy to allow for sediment removal without interruption to the system operation (i.e., settling tanks can be taken offline without interrupting treatment flow).
2. Handling and disposal of all solids generated during ATS operations shall be done in accordance with the SHMP in addition to all local, state, and federal laws and regulations.

G. ATS Instrumentation.

1. The ATS shall be equipped with instrumentation that automatically measures and records effluent water quality data and flow rate.
2. The minimum data recorded shall be consistent with the Monitoring and Reporting requirements below, and shall include:
 - a) Influent turbidity.
 - b) Effluent turbidity.
 - c) Influent pH.

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- d) Effluent pH.
 - e) Residual chemical.
 - f) Effluent flow rate.
 - g) Effluent flow volume.
3. Systems shall be equipped with a data recording system, such as data loggers or webserver-based systems, which records each measurement on a frequency no longer than once every 15 minutes.
 4. Cumulative flow volume shall be recorded daily. The data recording system shall have the capacity to record a minimum of seven days of continuous data.
 5. Instrumentation systems shall be interfaced with system control to provide auto shutoff or recirculation in the event that effluent measurements exceed turbidity or pH.
 6. The system shall also assure that upon system upset, power failure, or other catastrophic event, the ATS will default to a recirculation mode or safe shut down.
 7. Instrumentation (flow meters, probes, valves, streaming current detectors, controlling computers, etc.) shall be installed and maintained per manufacturer's recommendations, which shall be included in the QA/QC Plan.
 8. The QA/QC Plan shall also specify calibration procedures and frequencies, instrument method detection limit or sensitivity verification, laboratory duplicate procedures, and other pertinent procedures.
 9. The instrumentation system shall include a method for controlling coagulant dose to prevent potential overdosing. Available technologies include flow/turbidity proportional metering, periodic jar testing and metering pump adjustment, and ionic charge measurement controlling the metering pump.
- H. ATS Effluent Discharge.
1. ATS effluent shall comply with all provisions and prohibitions in the SIU Permit (to be acquired). The Owner or Engineer will perform all compliance testing associated with the treated water.
 2. Discharge from the ATS to the sewer utility may not exceed 250 gallons per minute during dry weather conditions. Treated water shall not be

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discharged to the sewer utility during a rain event of 0.1 inch or greater and must be held until 24 hours after the last rain.

3. Residual chemical concentration shall be less than 10 percent of MATC for the most sensitive species of the chemical used.

I. Operation and Maintenance Manual.

1. The Contractor shall prepare a site-specific Operation and Maintenance (O&M) Manual covering the procedures required to install, operate and maintain the ATS, in addition to procedures addressing system upsets and emergency shutdown. The manual shall include a list of qualified personnel assigned to operations and maintenance and their contact information. The O&M Manual shall be submitted for review and approval by the Engineer. The ATS may not be commissioned until the O&M Manual is approved.
2. The O&M Manual shall only be used in conjunction with appropriate project specific design specifications that describe the system configuration and operating parameters. Changes to the operations and maintenance of the ATS require prior approval by the Engineer.
3. The O&M Manual shall have operating manuals for specific pumps, generators, control systems, and other equipment.
4. The O&M Manual shall be updated and re-submitted, accordingly, with any changes made to the original manual; revisions to the manual shall be tracked in the document.

J. Sampling and Reporting QA/QC Plan.

1. The Contractor shall prepare a project-specific QA/QC Plan that shall include at a minimum:
 - a) Calibration – Calibration methods and frequencies for all system and field instruments shall be specified.
 - b) MDLs – The methods for determining MDLs shall be specified for each residual coagulant measurement method. Acceptable minimum MDLs for each method, specific to individual coagulants, shall be specified.
 - c) Laboratory Duplicates – Requirements for monthly laboratory duplicates for residual coagulant analysis shall be specified.

K. Personnel Training.

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1. Operators shall have training specific to using an ATS and liquid coagulants for storm water discharges in California.
2. The training shall be in the form of a formal class with a certificate and requirements for testing and certificate renewal.
3. Training shall include a minimum of eight hours classroom and 32 hours field training. The course shall cover the following topics:
 - a) Coagulation basics – chemistry and physical processes.
 - b) ATS system design and operating principles.
 - c) ATS control systems.
 - d) Coagulant selection – Jar testing, dose determination, etc.
 - e) Aquatic safety/toxicity of coagulants, proper handling and safety.
 - f) Monitoring, sampling, and analysis.
 - g) Reporting and recordkeeping.
 - h) Emergency response.
4. The Contractor shall submit training documentation (certifications) for review and approval by the Engineer. The ATS may not be commissioned until training documentation is approved.

L. ATS Monitoring Requirements.

1. The Contractor shall conduct the following visual monitoring:
 - a) A designated responsible and qualified person shall be on site daily at all times during treatment operations.
 - b) Daily on-site visual monitoring of the system for proper performance shall be conducted and recorded in the project data log.
 - c) The log shall include the name and phone number of the person responsible for system operation and monitoring.
 - d) The log shall include documentation of training acquired by the responsible person(s).
2. The Contractor shall conduct the following operational and compliance monitoring.

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- a) Flow shall be continuously monitored and recorded at not greater than 15-minute intervals for total volume treated and discharged.
 - b) Influent and effluent pH must be continuously monitored and recorded at not greater than 15-minute intervals.
 - c) Influent and effluent turbidity (expressed in NTU) must be continuously monitored and recorded at not greater than 15-minute intervals.
 - d) The type and amount of chemical used for pH adjustment, if any, shall be monitored and recorded.
 - e) Dose rate of chemical used in the ATS system (expressed in mg/L) shall be monitored and reported 15-minutes after startup and every 8 hours of operation.
 - f) Monthly laboratory duplicates for residual coagulant analysis must be performed and records shall be maintained on site.
 - g) Effluent shall be monitored and recorded for residual chemical/additive levels.
3. Monitoring documentation shall be legible, accurate, and kept current. Monitoring documentation shall be readily available upon request from Engineer. All monitoring documentation shall be submitted to the Engineer upon project completion in the form of legible photocopies of log books or in electronic files (Microsoft Word or PDF).

3.10 TRANSPORTATION AND DISPOSAL

- A. Dredged material may be tested by the Owner, prior to its shipment off site. The Contractor shall await confirmation from the Owner prior to disposing of material. Additional characterization of waste may be needed for treated timber or other debris.
- B. Load, transport, and dispose of dredged material by truck at Otay Landfill in Chula Vista, California (managed by Republic Services, Stacy Loveland, 480-516-1892). All wastes shall be transported in accordance with Federal, State, and local transportation requirements, including driver training, placarding, and use of shipping papers or waste manifests.
- C. Dredged material and debris shall be transported in trucks or sealed containers meeting all requirements of 49 CFR 173 and other applicable requirements, each lined with a new intact plastic liner with a minimum thickness of 6 mil. Hauling using standard dump trucks is not allowed without the specified lining.

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- D. No spillage or drainage from trucks or containers is allowed at any time during hauling or mode transfer off site. Trucks and containers shall be not be overloaded, shall meet applicable weight restrictions, shall have adequate free-board so as to prevent spillage during transit, and shall be covered in accordance with applicable regulations.
- E. The Contractor is advised that sediments may generate free liquid during haul due to separation and settling, and the Contractor's hauling methods shall address this possibility.
- F. The Contractor shall prepare a bill of lading (Contractor Solid Waste Tracking Sheet) for each shipment of nonhazardous material which fulfills the shipping paper requirements. The bill of lading shall satisfy the requirements of 49 CFR 172, Subpart C, (and 40 CFR 279 if shipping used oil) and any applicable state or local law or regulation, and shall be submitted to the Owner for review and approval.
- G. The Contractor shall identify a minimum of two temporary truck staging areas where trucks can await notification of filling time. Use of a temporary truck staging area will allow offhauling sediments to maintain a consistent flow of trucks. Potential temporary truck staging areas include truck stops and park-and-rides.

3.11 PUBLIC STREET AND ON-SITE ROADWAY CLEANING

- A. The Contractor shall be responsible for preventing dirt and dust escaping from trucks and other vehicles operating on or departing the Site by sweeping, covering dusty loads, washing truck tires prior to exiting the SMA and all other reasonable methods.
- B. Haul trucks shall be pressure washed prior to exiting the Site. Water generated during washing shall be contained within the SMA and treated prior to discharge.
- C. Contractor shall verify haul truck load limits on the first load of each working day.
- D. The Contractor shall clean public streets, roadways, and other paved surfaces immediately if sediment is spilled.
- E. In the event that these requirements are violated and no action is taken by the Contractor after notification of infraction by the Owner, the Owner reserves the right to have the streets, roadways, and other paved surfaces in question cleaned by others and the expense of the operation charged to the Contractor.
- F. Contractor shall provide proper driver training and enforce safe driving procedures at all times.

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END OF SECTION

APPENDIX A – PERMITS/PERMIT APPLICATIONS

**APPENDIX B – CLEANUP AND ABATEMENT ORDER NO.
R9-2012-0024**

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION**

**CLEANUP AND ABATEMENT ORDER
NO. R9-2012-0024**

NATIONAL STEEL AND SHIPBUILDING COMPANY

BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.

CITY OF SAN DIEGO

CAMPBELL INDUSTRIES

SAN DIEGO GAS AND ELECTRIC

UNITED STATES NAVY

SAN DIEGO UNIFIED PORT DISTRICT

SHIPYARD SEDIMENT SITE

SAN DIEGO BAY

SAN DIEGO, CALIFORNIA

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds as follows, based upon the weight of the evidence in this matter:

JURISDICTION

1. **WASTE DISCHARGE.** Elevated levels of pollutants above San Diego Bay background conditions exist in the San Diego Bay bottom marine sediment along the eastern shore of central San Diego Bay extending approximately from the Sampson Street Extension to the northwest and Chollas Creek to the southeast, and from the shoreline out to the San Diego Bay main shipping channel to the west. This area is hereinafter collectively referred to as the “Shipyard Sediment Site.” The National Steel and Shipbuilding Company Shipyard facility (NASSCO), the BAE Systems San Diego Ship Repair Facility (BAE Systems), the City of San Diego, San Diego Marine Construction Company,¹ Campbell Industries (Campbell), San Diego Gas and Electric (SDG&E), the United States Navy, and the San Diego Unified Port District (Port District) have each caused or permitted the discharge of waste to the Shipyard Sediment Site resulting in the accumulation of waste in the marine sediment. The contaminated marine sediment has caused conditions of pollution, contamination or nuisance in San Diego Bay that adversely affect aquatic life, aquatic-dependent wildlife, and human health San Diego Bay beneficial uses. A map of the Shipyard Sediment Area is provided in Attachment 1 to this Order (referred to interchangeably as CAO or Order).

RESPONSIBLE PERSON/DISCHARGER DETERMINATIONS

2. **NATIONAL STEEL AND SHIPBUILDING COMPANY (NASSCO), A SUBSIDIARY OF GENERAL DYNAMICS COMPANY.** The San Diego Water Board finds that NASSCO has caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. These wastes contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs), polynuclear aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons (TPH).

NASSCO, a subsidiary of General Dynamics Company, owns and operates a full service ship construction, modification, repair, and maintenance facility on 126 acres of tidelands property leased from the Port District on the eastern waterfront of central San Diego Bay at 2798 Harbor Drive in San Diego. Shipyard operations have been conducted at this site by NASSCO over San Diego Bay waters or very close to the waterfront since at least 1960. Shipyard facilities operated by NASSCO over the years at the Site have included concrete platens used for steel fabrication, a graving dock, shipbuilding ways, and berths on piers or

¹ San Diego Marine Construction Company is not identified as a discharger with responsibility for compliance with this Order because San Diego Marine Construction Company no longer exists and no corporate successor with legal responsibility for San Diego Marine Construction Company’s liabilities has been identified. See Finding No. 5 and the Technical Report Section 5.

land to accommodate the berthing of ships. An assortment of waste is generated at the facility including spent abrasive, paint, rust, petroleum products, marine growth, sanitary waste, and general refuse. Based on these considerations NASSCO is referred to as “Discharger(s)” in this Cleanup and Abatement Order (CAO).

3. **BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC., FORMERLY SOUTHWEST MARINE, INC.** The San Diego Water Board finds that BAE Systems caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. These wastes contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH.

From 1979 to the present, Southwest Marine, Inc. and its successor BAE Systems have owned and operated a ship repair, alteration, and overhaul facility on approximately 39.6 acres of tidelands property on the eastern waterfront of central San Diego Bay. The facility, currently referred to as BAE Systems San Diego Ship Repair, is located on land leased from the Port District at 2205 East Belt Street, foot of Sampson Street in San Diego, San Diego County, California. Shipyard facilities operated by BAE Systems over the years have included concrete platens used for steel fabrication, two floating dry docks, five piers, and two marine railways. An assortment of waste has been generated at the facility including spent abrasive, paint, rust, petroleum products, marine growth, sanitary waste, and general refuse. Based on these considerations BAE Systems is referred to as “Discharger(s)” in this CAO.

4. **CITY OF SAN DIEGO.** The San Diego Water Board finds that the City of San Diego caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. From the early 1900s through February 1963, when the relevant tideland areas were transferred from the City of San Diego to the Port District, the City was the trustee of and leased to various operators, all relevant portions of the Shipyard Sediment Site. The wastes the City of San Diego caused or permitted to be discharged, or to be deposited where they were discharged into San Diego Bay through its ownership of the Shipyard Sediment Site contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH.

The City of San Diego also owns and operates a municipal separate storm sewer system (MS4) through which it discharges waste commonly found in urban runoff to San Diego Bay subject to the terms and conditions of a National Pollutant Discharge Elimination System (NPDES) Storm Water Permit. The San Diego Water Board finds that the City of San Diego has discharged urban storm water containing waste directly to San Diego Bay at the Shipyard Sediment Site. The waste includes metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total suspended solids, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs) through its SW4 (located on the BAE Systems leasehold) and SW9 (located on the NASSCO leasehold) MS4 conduit pipes.

The San Diego Water Board finds that the City of San Diego has also discharged urban storm water containing waste through its MS4 to Chollas Creek resulting in the exceedances of chronic and acute California Toxics Rule copper, lead, and zinc criteria for the protection of aquatic life. Studies indicate that during storm events, storm water plumes toxic to marine life emanate from Chollas Creek up to 1.2 kilometers into San Diego Bay, and contribute to pollutant levels at the Shipyard Sediment Site. The urban storm water containing waste that has discharged from the on-site and off-site MS4 has contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, that cause, and threaten to cause, conditions of pollution, contamination, and nuisance by exceeding applicable water quality objectives for toxic pollutants in San Diego Bay. Based on these considerations the City of San Diego is referred to as “Discharger(s)” in this CAO.

5. **STAR & CRESCENT BOAT COMPANY.** The San Diego Water Board finds that between 1914 and 1972, San Diego Marine Construction Company operated a ship repair, alteration, and overhaul facility on what is now the BAE Systems leasehold at the foot of Sampson Street in San Diego. Shipyard operations were conducted at this site over San Diego Bay water or very close to the waterfront. An assortment of waste was generated at the facility, including spent abrasive blast waste, paint, rust, petroleum products, marine growth, sanitary waste and general refuse. These wastes contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH. In July 1972, San Diego Marine Construction Company sold its shipyard operations to Campbell Industries, and changed its corporate name, effective July 14, 1972, to Star & Crescent Investment Co. On March 19, 1976, Star & Crescent Boat Company (Star & Crescent), was incorporated in California and on April 9, 1976, Star & Crescent Investment Co. (formerly San Diego Marine Construction Company) transferred some portion of its assets and liabilities to Star & Crescent. The San Diego Water Board’s Cleanup Team and several other designated parties allege that Star & Crescent Investment Co. (formerly San Diego Marine Construction Company) transferred all of its liabilities and assets to Star & Crescent. Accordingly, these parties allege that Star & Crescent is the corporate successor of and responsible for the conditions of pollution or nuisance caused or permitted by San Diego Marine Construction Company. Star & Crescent denies that it is the corporate successor to San Diego Marine Construction Company’s and denies any responsibility for San Diego Marine Construction Company’s discharges of waste to the San Diego Bay Shipyard Sediment Site from 1914 to 1972.

The San Diego Water Board finds that San Diego Marine Construction Company caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. San Diego Marine Construction Company is no longer in existence. The San Diego Water Board declines to decide the legal and factual questions necessary to determine whether Star & Crescent is the corporate successor to and therefore liable for San Diego Marine Construction Company’s discharges. Due to Star & Crescent’s uncertain legal status and due to the pending federal court litigation to which Star & Crescent is a party and that the San Diego Water Board expects will address allocation issues associated with this Order, the San Diego Water Board does not name Star & Crescent as a Discharger under this

Order. The San Diego Water Board retains the authority to exercise its discretion to add Star & Crescent as a Discharger under this Order in the future. If the federal court determines that Star & Crescent is the corporate successor to San Diego Marine Construction Company (later Star & Crescent Investment Company), the San Diego Water Board directs the Cleanup Team to reevaluate whether it is appropriate to amend the Order to add Star & Crescent as a Discharger.

6. **CAMPBELL INDUSTRIES.** The San Diego Water Board finds that Campbell caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. These wastes contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH. From July 1972 through 1979, Campbell's wholly owned subsidiaries MCCSD and later San Diego Marine Construction Corporation operated a ship repair, alteration, and overhaul facility on what is now the BAE Systems leasehold at the foot of Sampson Street in San Diego. Shipyard operations were conducted at this site by Campbell over San Diego Bay waters or very close to the waterfront. An assortment of waste was generated at the facility including spent abrasive blast waste, paint, rust, petroleum products, marine growth, sanitary waste, and general refuse. Based on these considerations, Campbell is referred to as "Discharger(s)" in this CAO.
7. **CHEVRON, A SUBSIDIARY OF CHEVRONTEXACO.** Chevron, a subsidiary of ChevronTexaco (hereinafter, Chevron) owns and operates the Chevron Terminal, a bulk fuel storage facility currently located at 2351 East Harbor Drive in the City of San Diego adjacent to the NASSCO and BAE Systems leaseholds. Fuel products containing petroleum hydrocarbons have been stored at the Chevron Terminal since the early 1900s at both the currently operating 7 million gallon product capacity upper tank farm and the closed 5 million gallon capacity lower tank farm. Based on the information that the San Diego Water Board has reviewed to date, there is insufficient evidence to find that discharges from the Chevron Terminal contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, which create, or threaten to create, conditions of pollution or nuisance. Accordingly, Chevron is not referred to as "Discharger(s)" in this CAO.
8. **BP AS THE PARENT COMPANY AND SUCCESSOR TO ATLANTIC RICHFIELD.** BP owns and operates the Atlantic Richfield Company (ARCO) Terminal, a bulk fuel storage facility with approximately 9 million gallons of capacity located at 2295 East Harbor Drive in the City of San Diego. Fuel products containing petroleum hydrocarbons and related constituents such as PAHs have been stored at ARCO Terminal since the early 1900s. ARCO owned and operated ancillary facilities include a wharf, fuel pier (currently BAE Systems Pier 4), and a marine fueling station used for loading and unloading petroleum products and fueling from 1925 to 1978, and five pipelines connecting the terminal to the pier and wharf in use from 1925 to 1978. Storm water flows from ARCO Terminal enter a City of San Diego MS4 storm drain that terminates in San Diego Bay in the Shipyard Sediment Site approximately 300 feet south of the Sampson Street extension. Based on the information that the San Diego Water Board has reviewed

to date, there is insufficient evidence to find that discharges from the ARCO Terminal contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, which create, or threaten to create, conditions of pollution or nuisance. Accordingly, BP and ARCO are not referred to as “Discharger(s)” in this CAO.

9. **SAN DIEGO GAS AND ELECTRIC, A SUBSIDIARY OF SEMPRA ENERGY.**

SDG&E owned and operated the Silver Gate Power Plant along the north side of the BAE Systems leasehold from approximately 1943 to the 1990s. SDG&E utilized an easement to San Diego Bay along BAE Systems’ north property boundary for the intake and discharge of cooling water via concrete tunnels at flow rates ranging from 120 to 180 million gallons per day. SDG&E operations included discharging waste to holding ponds above the tunnels near the Shipyard Sediment Site.

The San Diego Water Board finds that SDG&E has caused or permitted waste (including metals [chromium, copper, lead, nickel, and zinc], PCBs, PAHs, and total petroleum hydrocarbons [TPH-d and TPH-h]) to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. Based on these considerations SDG&E is referred to as “Discharger(s)” in this CAO.

10. **UNITED STATES NAVY.** The San Diego Water Board finds that the United States Navy (hereinafter “U.S. Navy”) caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. The U.S. Navy owns and operates a municipal separate storm sewer system (MS4) at Naval Base San Diego (NBSD), formerly Naval Station San Diego or NAVSTA, through which it has caused or permitted the discharge of waste commonly found in urban runoff to Chollas Creek and San Diego Bay, including excessive concentrations of copper, lead, and zinc in violation of waste discharge requirements. Technical reports by the U.S. Navy and others indicate that Chollas Creek outflows during storm events convey elevated sediment and urban runoff chemical pollutant loading and its associated toxicity up to 1.2 kilometers into San Diego Bay over an area including the Shipyard Sediment Site.

The San Diego Water Board finds that the U.S. Navy has caused or permitted marine sediment and associated waste to be resuspended into the water column as a result of shear forces generated by the thrust of propellers during ship movements at NBSD. The resuspended sediment and pollutants can be transported by tidal currents and deposited in other parts of San Diego Bay, including the Shipyard Sediment Site. The above discharges have contributed to the accumulation of pollutants in marine sediment at the Shipyard Sediment Site to levels that cause, and threaten to cause, conditions of pollution, contamination, and nuisance by exceeding applicable water quality objectives for toxic pollutants in San Diego Bay.

Also, from 1921 to the present, the U.S. Navy has provided shore support and pier-side berthing services to U.S. Pacific fleet vessels at NBSD located at 3445 Surface Navy Boulevard in the City of San Diego. NBSD currently occupies 1,029 acres of land and 326

water acres adjacent to San Diego Bay to the west, and Chollas Creek to the north near Pier 1. Between 1938 and 1956, the NBSD leasehold included a parcel of land within the Shipyard Sediment Site referred to as the 28th Street Shore Boat Landing Station, located at the south end of the present day NASSCO leasehold at the foot of 28th Street and including the 28th Street Pier. The San Diego Water Board finds that the U.S. Navy caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance at this location when it conducted operations similar in scope to a small boatyard, including solvent cleaning and degreasing of vessel parts and surfaces, abrasive blasting and scraping for paint removal and surface preparations, metal plating, and surface finishing and painting. Prevailing industry-wide boatyard operational practices employed during the 1930s through the 1980s were often not sufficient to adequately control or prevent pollutant discharges, and often led to excessive discharges of pollutants and accumulation of pollutants in marine sediment in San Diego Bay. The types of pollutants found in elevated concentrations at the Shipyard Sediment Site (metals, butyltin species, PCBs, PCTs, PAHs, and TPH) are associated with the characteristics of the waste the U.S. Navy operations generated at the 28th Street Shore Boat Landing Station site. Based on the preceding considerations, the U.S. Navy is referred to as “Discharger(s)” in this CAO.

11. **SAN DIEGO UNIFIED PORT DISTRICT.** The San Diego Water Board finds that the Port District caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. The Port District is a special government entity, created in 1962 by the San Diego Unified Port District Act, California Harbors and Navigation Code Appendix I, in order to manage San Diego Harbor, and administer certain public lands along San Diego Bay. The Port District holds and manages as trust property on behalf of the People of the State of California the land occupied by NASSCO, BAE Systems, and the cooling water tunnels for SDG&E’s former Silver Gate Power Plant. The Port District is also the trustee of the land formerly occupied by the San Diego Marine Construction Company and by Campbell at all times since 1963 during which they conducted shipbuilding and repair activities.² The Port District’s own ordinances, which date back to 1963, prohibit the deposit or discharge of any chemicals or waste to the tidelands or San Diego Bay and make it unlawful to discharge pollutants in non-storm water directly or indirectly into the storm water conveyance system.

The wastes the Port District caused or permitted to be discharged, or to be deposited where they were discharged into San Diego Bay through its ownership of the Shipyard Sediment Site contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH.

The San Diego Water Board has the discretion to name the Port District in its capacity as the State’s trustee as a “discharger” and does so in the Shipyard Sediment site CAO. The Port District asserts that its status as a lessor and State’s trustee as well as other factors

² San Diego Marine Construction Company and Campbell Industries owned and operated ship repair and construction facilities in past years prior to BAE Systems San Diego Ship Repair, Inc.’s occupation of the leasehold. See Sections 5 and 6 of the Technical Report.

should only give rise to secondary and not primary liability as a discharger under this Order. Allocation of responsibility has not been determined and there is insufficient evidence to establish that present and former Port District tenants at the Site each have sufficient financial resources to perform all of the remedial activities required by this Order. In addition, cleanup is not underway at this time. Under these circumstances, it is not appropriate to accord the Port District secondary liability status it seeks.

The Port District also owns and operates a municipal separate storm sewer system (MS4) through which it discharges waste commonly found in urban runoff to San Diego Bay subject to the terms and conditions of an NPDES Storm Water Permit. The San Diego Water Board finds that the Port District has discharged urban storm water containing waste directly or indirectly to San Diego Bay at the Shipyard Sediment Site. The waste includes metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total suspended solids, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs).

The urban storm water containing waste that has discharged from the on-site and off-site MS4 has contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, that cause, and threaten to cause, conditions of pollution, contamination, and nuisance by exceeding applicable water quality objectives for toxic pollutants in San Diego Bay. Based on these considerations the San Diego Unified Port District is referred to as “Discharger(s)” in this CAO.

FACTUAL BACKGROUND

12. **CLEAN WATER ACT SECTION 303(d) LIST.** The San Diego Bay shoreline between Sampson and 28th Streets is listed on the Clean Water Act section 303(d) List of Water Quality Limited Segments for elevated levels of copper, mercury, zinc, PAHs, and PCBs in the marine sediment. These pollutants are impairing the aquatic life, aquatic-dependent wildlife, and human health beneficial uses designated for San Diego Bay and are causing the Bay’s narrative water quality objective for toxicity to not be attained. The Shipyard Sediment Site occupies this shoreline. Issuance of a CAO (in lieu of a Total Maximum Daily Load program) is the appropriate regulatory tool to use for correcting the impairment at the Shipyard Sediment Site.
13. **SEDIMENT QUALITY INVESTIGATION.** NASSCO and BAE Systems conducted a detailed sediment investigation at the Shipyard Sediment Site in San Diego Bay within and adjacent to the NASSCO and BAE Systems leaseholds. Two phases of fieldwork were conducted, Phase I in 2001 and Phase II in 2002. The results of the investigation are provided in the Exponent report *NASSCO and Southwest Marine Detailed Sediment Investigation, September 2003 (Shipyard Report, Exponent 2003)*. Unless otherwise explicitly stated, the San Diego Water Board’s finding and conclusions in this CAO are based on the data and other technical information contained in the Shipyard Report prepared by NASSCO’s and BAE Systems’ consultant, Exponent.

The Shipyard Sediment Site is exempt from the Phase I Sediment Quality Objectives

promulgated by the State Water Board because a site assessment (the Shipyard Report) was completed and submitted to the San Diego Water Board on October 15, 2003. See State Water Board, *Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality*, II.B.2 (August 25, 2009).

IMPAIRMENT OF AQUATIC LIFE BENEFICIAL USES

14. **AQUATIC LIFE IMPAIRMENT.** Aquatic life beneficial uses designated for San Diego Bay are impaired due to the elevated levels of pollutants present in the marine sediment at the Shipyard Sediment Site. Aquatic life beneficial uses include: Estuarine Habitat (EST), Marine Habitat (MAR), and Migration of Aquatic Organisms (MIGR). This finding is based on the considerations described below in this *Impairment of Aquatic Life Beneficial Uses* section of the CAO.
15. **WEIGHT-OF-EVIDENCE APPROACH.** The San Diego Water Board used a weight-of-evidence approach based upon multiple lines of evidence to evaluate the potential risks to aquatic life beneficial uses from pollutants at the Shipyard Sediment Site. The approach focused on measuring and evaluating exposure and adverse effects to the benthic macroinvertebrate community and to fish using data from multiple lines of evidence and best professional judgment. Pollutant exposure and adverse effects to the benthic macroinvertebrate community were evaluated using sediment quality triad measurements, and bioaccumulation analyses, and interstitial water (i.e., pore water) analyses. The San Diego Water Board evaluated pollutant exposure and adverse effects to fish using fish histopathology analyses and analyses of PAH breakdown products in fish bile.
16. **SEDIMENT QUALITY TRIAD MEASURES.** The San Diego Water Board used lines of evidence organized into a sediment quality triad, to evaluate potential risks to the benthic community from pollutants present in the Shipyard Sediment Site. The sediment quality triad provides a “weight-of-evidence” approach to sediment quality assessment by integrating synoptic measures of sediment chemistry, toxicity, and benthic community composition. All three measures provide a framework of complementary evidence for assessing the degree of pollutant-induced degradation in the benthic community.
17. **REFERENCE SEDIMENT QUALITY CONDITIONS.** The San Diego Water Board selected a group of reference stations from three independent sediment quality investigations to contrast pollution conditions at the Shipyard Sediment Site with conditions found in other relatively cleaner areas of San Diego Bay not affected by the Shipyard Sediment Site: (1) Southern California Bight 1998 Regional Monitoring Program (Bight 98), (2) 2001 Mouth of Chollas Creek and Mouth of Paleta Creek TMDL studies, and (3) 2001 NASSCO and BAE Systems Detailed Sediment Investigation. Stations from these studies were selected to represent selected physical, chemical, and biological characteristics of San Diego Bay. Criteria for selecting acceptable reference stations included low levels of anthropogenic pollutant concentrations, locations remote from pollution sources, similar biological habitat to the Shipyard Sediment Site, sediment total organic carbon (TOC) and grain size profiles similar to the Shipyard Sediment Site, adequate sample size for statistical analysis, and sediment quality data comparability. The

reference stations selected for the Reference Sediment Quality Conditions are identified below.

Reference Stations Used To Establish Reference Sediment Quality Conditions

2001 Chollas/Paleta Reference Station Identification Number	2001 NASSCO/BAE Systems Reference Station Identification Number	1998 Bight'98 Reference Station Identification Number
2231	2231	2235
2243	2243	2241
2433	2433	2242
2441	2441	2243
2238		2256
		2257
		2258
		2260
		2265

18. **SEDIMENT QUALITY TRIAD RESULTS.** The San Diego Water Board categorized 6 of 30 sediment quality triad sampling stations at the Shipyard Sediment Site as having sediment pollutant levels “Likely” to adversely affect the health of the benthic community. The remaining triad stations were classified as “Possible” (13) and “Unlikely” (11). These results are based on the synoptic measures of sediment chemistry, toxicity, and benthic community structure at the Shipyard Sediment Site.

19. **BIOACCUMULATION.** The San Diego Water Board evaluated initial laboratory bioaccumulation test data to ascertain the bioaccumulation potential of the sediment chemical pollutants at the Shipyard Sediment Site. Examination of laboratory test data on the chemical pollutant concentrations in tissue of the clam *Macoma nasuta* relative to the pollutant concentrations in sediment indicates that bioaccumulation of chemical pollutants is occurring at the Shipyard Sediment Site. The data indicates for several chemical pollutants that concentrations in *Macoma nasuta* tissue increase proportionally as chemical pollutant concentrations in sediment increase. Statistically significant relationships were found for arsenic, copper, lead, mercury, zinc, tributyltin (TBT), PCBs, and high molecular weight polynuclear aromatic hydrocarbons (HPAHs). These chemical pollutants have a bioaccumulation potential at the Shipyard Sediment Site and are therefore considered bioavailable to benthic organisms. No statistically significant relationships were found for cadmium, chromium, nickel, selenium, silver, or PCTs.

20. **INDICATOR SEDIMENT CHEMICALS.** The San Diego Water Board evaluated the relationships between sediment chemical pollutants and biological responses to identify

indicator chemical pollutants that may be impacting aquatic life and would therefore be candidates for assignment of cleanup levels or remediation goals. A two-step process was conducted. The first step in the selection of indicator chemicals was to identify chemicals representative of the major classes of sediment pollutants: metals, butyltins, PCBs and PCTs, PAHs, and petroleum hydrocarbons. The second step was the evaluation of relationships between these chemicals and biological responses. Results of the three toxicity tests, benthic community assessment, and bioaccumulation testing conducted in Phase 1 of the Shipyard study were all used to evaluate the potential of such relationships. Chemical pollutants were selected as indicator chemicals if they had any statistically significant relationship with amphipod mortality, echinoderm fertilization, bivalve development, total benthic macroinvertebrate abundance, total benthic macroinvertebrate richness, or tissue chemical concentrations in *Macoma nasuta*. Chemical pollutants selected as indicator chemicals include arsenic, copper, lead, mercury, zinc, TBT, total PCB homologs, diesel range organics (DRO), and residual range organics (RRO).

IMPAIRMENT OF AQUATIC-DEPENDENT WILDLIFE BENEFICIAL USES

21. **AQUATIC-DEPENDENT WILDLIFE IMPAIRMENT.** Aquatic-dependent wildlife beneficial uses designated for San Diego Bay are impaired due to the elevated levels of pollutants present in the marine sediment at the Shipyard Sediment Site. Aquatic-dependent wildlife beneficial uses include: Wildlife Habitat (WILD), Preservation of Biological Habitats of Special Significance (BIOL), and Rare, Threatened, or Endangered Species (RARE). This finding is based on the considerations described below in the *Impairment of Aquatic-Dependent Wildlife Beneficial Uses* section of this CAO.
22. **RISK ASSESSMENT APPROACH FOR AQUATIC-DEPENDENT WILDLIFE.** The San Diego Water Board evaluated potential risks to aquatic-dependent wildlife from chemical pollutants present in the sediment at the Shipyard Sediment Site based on a two-tier approach. The Tier I screening level risk assessment was based on tissue data derived from the exposure of the clam *Macoma nasuta* to site sediments for 28 days using the protocols specified by American Society of Testing Material (ASTM). The Tier II baseline comprehensive risk assessment was based on tissue data derived from resident fish and shellfish caught within and adjacent to the Shipyard Sediment Site.
23. **TIER I SCREENING LEVEL RISK ASSESSMENT FOR AQUATIC-DEPENDENT WILDLIFE.** The Tier I risk assessment objectives were to determine whether or not Shipyard Sediment Site conditions pose a potential unacceptable risk to aquatic-dependent wildlife receptors of concern and to identify whether a comprehensive, site-specific risk assessment was warranted (i.e., Tier II baseline risk assessment). The receptors of concern selected for the assessment 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 (*Chelonia mydas agassizii*). Chemical pollutant concentrations measured in clam tissue derived from laboratory bioaccumulation tests were used to estimate chemical exposure to these receptors of concern. Based on the Tier I screening level risk assessment results, there is a potential

risk to all receptors of concern ingesting prey caught at the Shipyard Sediment Site. The chemical pollutants in *Macoma* tissue posing a potential risk include arsenic, copper, lead, zinc, benzo[a]pyrene (BAP), and total PCBs. The results of the Tier I risk assessment indicated that a Tier II baseline comprehensive risk assessment was warranted.

24. **TIER II BASELINE COMPREHENSIVE RISK ASSESSMENT FOR AQUATIC-DEPENDENT WILDLIFE.** The Tier II risk assessment objective was to more conclusively determine whether or not Shipyard Sediment Site conditions pose an unacceptable risk to aquatic-dependent wildlife receptors of concern. The receptors of concern selected for the assessment 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 (*Chelonia mydas agassizii*). Based on the Tier I screening level risk assessment results, there is a potential risk to all receptors of concern ingesting prey caught at the Shipyard Sediment Site and so a Tier II assessment was conducted. To focus the risk assessment, prey items were collected within four assessment units at the Shipyard Sediment Site and from a reference area located across the bay from the site. Chemical concentrations measured in fish were used to estimate chemical exposure for the least tern, western grebe, brown pelican, and sea lion and chemical concentrations in benthic mussels and eelgrass were used to estimate chemical pollutant exposure for the surf scoter and green turtle, respectively. 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 receptors of concern (excluding the sea lion). The chemicals in prey tissue posing a risk include BAP, PCBs, copper, lead, mercury, and zinc.

IMPAIRMENT OF HUMAN HEALTH BENEFICIAL USES

25. **HUMAN HEALTH IMPAIRMENT.** Human health beneficial uses for Shellfish Harvesting (SHELL), and Commercial and Sport Fishing (COMM) designated for San Diego Bay are impaired due to the elevated levels of pollutants present in the marine sediment at the Shipyard Sediment Site. This finding is based on the considerations described below in this *Impairment of Human Health Beneficial Uses* section of the CAO.
26. **RISK ASSESSMENT APPROACH FOR HUMAN HEALTH.** The San Diego Water Board evaluated potential risks to human health from chemical pollutants present in the sediment at the Shipyard Sediment Site based on a two-tier approach. The Tier I screening level risk assessment was based on tissue data derived from the exposure of the clam *Macoma nasuta* to site sediments for 28 days using ASTM protocols. The Tier II baseline comprehensive risk assessment was based on tissue data derived from resident fish and shellfish caught within and adjacent to the Shipyard Sediment Site. Two types of receptors (i.e., members of the population or individuals at risk) were evaluated:
- Recreational Anglers – Persons who eat the fish and/or shellfish they catch recreationally; and

- b. Subsistence Anglers – Persons who fish for food, for economic and/or cultural reasons, and for whom the fish and/or shellfish caught is a major source of protein in their diet.
27. **TIER I SCREENING LEVEL RISK ASSESSMENT FOR HUMAN HEALTH.** The Tier I risk assessment objectives were to determine whether or not Shipyard Sediment Site conditions potentially pose an unacceptable risk to human health and to identify if a comprehensive, site-specific risk assessment was warranted (i.e., Tier II baseline risk assessment). The receptors of concern identified for Tier I are recreational anglers and subsistence anglers. Recreational anglers represent those who eat the fish and/or shellfish they catch recreationally and subsistence anglers represent those who fish for food, for economic and/or cultural reasons, and for whom the fish and/or shellfish caught is a major source of protein in the diet. Chemical concentrations measured in *Macoma nasuta* tissue derived from laboratory bioaccumulation tests were used to estimate chemical exposure for these receptors of concern. Based on the Tier I screening level risk assessment results, there is a potential risk greater than that in reference areas to recreational and subsistence anglers ingesting fish and shellfish caught at the Shipyard Sediment Site. The chemicals in *Macoma* tissue posing a potential risk include arsenic, BAP, PCBs, and TBT.
28. **TIER II BASELINE COMPREHENSIVE RISK ASSESSMENT FOR HUMAN HEALTH.** The Tier II risk assessment objective was to more conclusively determine whether Shipyard Sediment Site conditions pose unacceptable cancer and non-cancer health risks to recreational and subsistence anglers. Fish and shellfish were collected within four assessment units at the Shipyard Sediment Site and from two reference areas located across the bay from the Shipyard Site. Chemical concentrations measured in fish fillets and edible shellfish tissue were used to estimate chemical exposure for recreational anglers and chemical concentrations in fish whole bodies and shellfish whole bodies were used to estimate chemical exposure for subsistence anglers. Based on the Tier II risk assessment results, ingestion of fish and shellfish caught within all four assessment units at the Shipyard Sediment Site poses a theoretical increased cancer and non-cancer risk greater than that in reference areas to recreational and subsistence anglers. The chemicals posing theoretical increased cancer risks include inorganic arsenic and PCBs. The chemicals posing theoretical increased non-cancer risks include cadmium, copper, mercury, and PCBs.

*EVALUATING FEASIBILITY OF CLEANUP TO BACKGROUND
SEDIMENT QUALITY CONDITIONS*

29. **CHEMICALS OF CONCERN AND BACKGROUND SEDIMENT QUALITY.** The San Diego Water Board derived sediment chemistry levels for use in evaluating the feasibility of cleanup to background sediment quality conditions from the pool of San Diego Bay reference stations described in Finding 17. The background sediment chemistry levels based on these reference stations are as follows:

Table 1. Background Sediment Chemistry Levels

Chemicals of Concern	Units (dry weight)	Background Sediment Chemistry Levels ¹
Primary COCs		
Copper	mg/kg	121
Mercury	mg/kg	0.57
HPAHs ²	µg/kg	663
PCBs ³	µg/kg	84
Tributyltin	µg/kg	22
Secondary COCs		
Arsenic	mg/kg	7.5
Cadmium	mg/kg	0.33
Lead	mg/kg	53
Zinc	mg/kg	192

1. Equal to the 2005 Reference Pool's 95% upper predictive limits shown in Section 18 of the *Technical Report for Cleanup and Abatement Order No.R9-2012-0024*. The background levels for metals are based on the % fines:metals regression using 50% fines, which is conservative because the mean fine grain sediment at the Shipyard Investigation Site is 70% fines.
2. HPAHs = sum of 6 PAHs: Fluoranthene, Perylene, Benzo[a]anthracene, Chrysene, Benzo[a]pyrene, and Dibenzo[a,h]anthracene.
3. 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.

The San Diego Water Board identified constituents of primary concern (primary COCs), which are associated with the greatest exceedance of background and highest magnitude of potential risk at the Shipyard Sediment Site. A greater concentration relative to background suggests a stronger association with the Shipyard Sediment Site, and a higher potential for exposure reduction via remediation. Secondary contaminants of concern (secondary COCs) are contaminants with lower concentrations relative to background, and are highly correlated with primary COCs and would be addressed in a common remedial footprint. Based on these criteria, the primary COCs for the Shipyard Sediment Site are copper, mercury, HPAHs,³ PCBs, and TBT, and the secondary COCs are arsenic, cadmium, lead, and zinc.

³ Petroleum hydrocarbons, including TPH, RRO, DRO, and other PAHs were eliminated as primary and secondary COCs for the following reasons. HPAHs, a primary COC, are considered to be the most recalcitrant, bioavailable, and toxic compounds present in the complex mixture of petroleum hydrocarbons. Other measures of petroleum hydrocarbons are generally correlated with HPAHs such that remedial measures to address HPAHs will also address

30. **TECHNOLOGICAL FEASIBILITY CONSIDERATIONS.** Although there are complexities and difficulties that would need to be addressed and overcome (e.g. removal and handling of large volume of sediment; obstructions such as piers and ongoing shipyard operations; transportation and disposal of waste), it is technologically feasible to cleanup to the background sediment quality levels utilizing one or more remedial and disposal techniques. Mechanical dredging, subaqueous capping, and natural recovery have been successfully performed at numerous sites, including several in San Diego Bay, and many of these projects have successfully overcome the same types of operational limitations present at the Shipyard Sediment Site, such as piers and other obstructions, ship movements, and limited staging areas. Confined aquatic disposal or near-shore confined disposal facilities have also been employed in San Diego Bay and elsewhere, and may be evaluated as project alternatives for the management of sediment removed from the Shipyard Sediment Site.
31. **ECONOMIC FEASIBILITY CONSIDERATIONS.** Under State Water Board Resolution No. 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*, determining “economic feasibility” requires an objective balancing of the incremental benefit of attaining further reduction in the concentrations of primary COCs as compared with the incremental cost of achieving those reductions. Resolution No. 92-49 provides that “[e]conomic feasibility does not refer to the dischargers’ ability to finance cleanup.” When considering appropriate cleanup levels under Resolution No. 92-49, the San Diego Water Board is charged with evaluating “economic feasibility” by estimating the costs to remediate constituents of concern at a site to background and the costs of implementing other alternative remedial levels. An economically feasible alternative cleanup level is one where the incremental cost of further reductions in primary COCs outweighs the incremental benefits.

The San Diego Water Board evaluated a number of criteria to determine risks, costs, and benefits associated with no action, cleanups to background sediment chemistry levels, and alternative cleanup levels greater than background concentrations. The criteria included factors such as total cost, volume of sediment dredged, exposure pathways of receptors to contaminants, short- and long-term effects on beneficial uses (as they fall into the broader categories of aquatic life, aquatic-dependent wildlife, and human health). The San Diego Water Board then compared these cost criteria against the benefits gained by diminishing exposure to the primary COCs to estimate the incremental benefit gained from reducing exposure based on the incremental costs of doing so. As set 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.

environmental concerns associated with elevated levels of low molecular weight PAHs (LPAHs), total PAHs, TPH, RRO and DRO.

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 the waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. 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.

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):

Alternative Cleanup Levels are Appropriate. Cleaning up to background sediment quality levels at the Shipyard Sediment Site is economically infeasible. The alternative cleanup levels established for the Shipyard Sediment Site are the lowest levels that are technologically and economically achievable, as required under the California Code of Regulations Title 23 section 2550.4(e).

Alternative Cleanup Levels are Consistent with Water Quality Control Plans and Policies. The alternative cleanup levels provide for the reasonable protection of San Diego Bay beneficial uses and will not result in water quality less than prescribed in water quality control plans and policies adopted by the State Water Board and the San Diego Water Board. While it is impossible to determine the precise level of water quality that will be attained given the residual sediment pollutant constituents that will remain at the Site, compliance with the alternative cleanup levels will markedly improve water quality conditions at the Shipyard Sediment Site and result in attainment of water quality standards at the site.

Alternative Cleanup Levels Will Not Unreasonably Affect Present and Anticipated Beneficial Uses of the Site. The level of water quality that will be attained upon remediation of the required cleanup at the Shipyard Sediment Site will not unreasonably affect San Diego Bay beneficial uses assigned to the Shipyard Sediment Site represented by aquatic life, aquatic-dependent wildlife, and human health.

Alternative Cleanup Levels are Consistent with the Maximum Benefit to the People of the State. The proposed alternative cleanup levels are consistent with maximum benefit to the people of the State based on the San Diego Bay resource protection, mass removal and source control, and economic considerations. The Shipyard Sediment Site pollution is located in San Diego Bay, one of the finest natural harbors in the world. San Diego Bay is an important and valuable resource to San Diego and the Southern California Region. The alternative cleanup levels will result in significant contaminant mass removal and therefore risk reduction from San Diego Bay. Remediated areas will approach reference area sediment concentrations for most contaminants. Compared to cleaning up to background cleanup levels, cleaning up to the alternative cleanup levels will cause less diesel emission, less greenhouse gas emission, less noise, less truck traffic, have a lower potential for accidents, and less disruption to the local community. Achieving the alternative cleanup levels also requires less barge and crane movement on San Diego Bay, has a lower risk of re-suspension of contaminated sediments, and reduces the amount of landfill capacity required to dispose of the sediment wastes. The alternative cleanup levels properly balance reasonable protection of San Diego Bay beneficial uses with the significant economic and service activities provided by the City of San Diego, the NASSCO and BAE Systems Shipyards and the U.S. Navy.

33. **PROPOSED REMEDIAL FOOTPRINT AND PRELIMINARY REMEDIAL DESIGN.** Polygonal areas were developed around the sampling stations at the Shipyard Sediment Site using the Thiessen Polygon method to facilitate the development of the remedial footprint. The polygons targeted for remediation are shown in red and green in

Attachment 2. The red areas are where the proposed remedial action is dredging. The areas shown in green represent inaccessible or under-pier areas that will be remediated by one or more methods other than dredging. Portions of polygons NA20, NA21, and NA22 as shown in Attachment 2 were omitted from this analysis because it falls within an area that is being evaluated as part of the TMDLs for Toxic Pollutants in Sediment at the Mouth of Chollas Creek TMDL and is not considered part of the Shipyard Sediment Site for purposes of the CAO.

The polygons were ranked based on a number of factors including likely impaired stations, composite surface-area weighted average concentration for the five primary COCs, Site-Specific Median Effects Quotient (SS-MEQ)⁴ for non-Triad stations, and highest concentration of individual primary COCs. Based on these rankings, polygons were selected for remediation on a “worst first” basis.

In recognition of the methodologies and limitations of traditional mechanical dredging, the irregular polygons were converted into uniform dredge units. Each dredge unit (sediment management unit or “SMU”) was then used to develop the dredge footprint. The conversion from irregular polygons to SMUs is shown in Attachments 3 and 4. These attachments show the remedial footprint, inclusive of areas to be dredged (“dredge remedial area,” in red) and under-pier areas (“under-pier remedial area,” in green) to be remediated by other means, most likely by sand cover. Together, the dredge remedial area and the under-pier remedial area constitute the remedial footprint.

Upland source control measures in the watershed of municipal separate storm sewer system outfall SW-4 are also needed to eliminate ongoing contamination from this source, if any, and ensure that recontamination of cleaned up areas of the Shipyard Sediment Site from this source does not occur.

34. **REMEDIAL MONITORING PROGRAM.** Monitoring during remediation activities is needed to document that remedial actions have not caused water quality standards to be violated outside of the remedial footprint, that the target cleanup levels have been reached within the remedial footprint, and to assess sediment for appropriate disposal. This monitoring should include water quality monitoring, sediment monitoring, and disposal monitoring.

Post-remediation monitoring is needed to verify that remaining pollutant concentrations in the sediments will not unreasonably affect San Diego Bay beneficial uses. Post-remediation monitoring should be initiated two years after remedy implementation has been completed and continue for a period of up to 10 years after remediation. For human health and aquatic dependent wildlife beneficial uses, post-remediation monitoring should include sediment chemistry monitoring to ensure that post-remediation SWACs are maintained at the site following cleanup. A subset of samples should undergo bioaccumulation testing using *Macoma*. For aquatic life beneficial uses, post-remediation

⁴ The SS-MEQ is a threshold developed to predict likely benthic community impairments based on sediment chemistry at the Shipyard Sediment Site. The development, validation, and application of the SS-MEQ are described in Section 32.5.2 of the Technical Report.

monitoring should include sediment chemistry, and toxicity bioassays to verify that post-remedial conditions have the potential to support a healthy benthic community. In addition, post-remediation monitoring should include benthic community condition assessments to evaluate the overall impact of remediation on the benthic community re-colonization activities.

Environmental data has natural variability which does not represent a true difference from expected values. Therefore, if remedial monitoring results are within an acceptable range of the expected outcome, the remedial actions will be considered successful.

35. **REMEDIAL ACTION IMPLEMENTATION SCHEDULE.** The Dischargers have proposed a remedial action implementation schedule and a description of specific remedial actions they intend to undertake to comply with this CAO. The remedial action implementation schedule will begin with the adoption of this CAO and end with the submission of final reports documenting that the alternative sediment cleanup levels have been met. From start to finish, remedial action implementation is expected to take approximately 5 years to complete.

The proposed remedial actions have a substantial likelihood to achieve compliance with the requirements of this CAO within a reasonable time frame. The proposed schedule is as short as possible, given 1) the scope, size, complexity, and cost of the remediation, 2) industry experience with the time typically required to implement similar remedial actions, 3) the time needed to secure other regulatory agency approvals and permits before remediation can start, and 4) the need to conduct dredging in a phased manner to prevent or reduce adverse effects to the endangered California Least Tern. Therefore, the remedial action implementation schedule proposed by the Dischargers is consistent with the provisions in Resolution No. 92-49 for schedules for cleanup and abatement.

36. **LEGAL AND REGULATORY AUTHORITY.** This Order is based on (1) section 13267 and Chapter 5, Enforcement, of the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with section 13000), commencing with section 13300; (2) applicable state and federal regulations; (3) all applicable provisions of statewide Water Quality Control Plans adopted by the State Water Resources Control Board and the *Water Quality Control Plan for the San Diego Basin* (Basin Plan) adopted by the San Diego Water Board including beneficial uses, water quality objectives, and implementation plans; (4) State Water Board policies for water quality control, including State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California* and Resolution No. 92-49, *Policies and Procedures 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.⁵ 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 and certified the EIR, adopting a statement of overriding considerations, in Resolution No. R9-2012-0025.

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, evidence, testimony and recommendations.
39. **PUBLIC HEARING.** A lengthy procedural history preceded adoption of this CAO. The San Diego Water Board has considered all comments, evidence and testimony pertaining to this CAO submitted to the San Diego Water Board in writing, or by oral presentations at the public hearing held on November 9, 14, 15, and 16, 2011, and March 14, 2012. Responses to many relevant comments have been incorporated into the Technical Report for this CAO and/or are provided in the Response to Comments Report, as revised, prepared by the San Diego Water Board Cleanup Team.
40. **TECHNICAL REPORT.** The “*Technical Report for Cleanup and Abatement Order No. R9-2012-0024 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 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.

Unreimbursed reasonable 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 are as follows:

- 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.

⁵ Title 14 CCR sections 15307, 15308, and 15321

- 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.
 - 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.
 - 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.
- b. 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 \$2,919 and the County Clerk Processing fee is 50.00 for a total of \$2,969.

The amount of past and future recoverable staff costs will be determined through the process set forth in Water Code section 13365. The Chair may designate an individual qualified under Water Code section 13365, subdivision (c)(4) to resolve dischargers' disputes about the reasonableness of past and future oversight costs the San Diego Water Board seeks to recover from the dischargers to this Order. Under Water Code section 13365, the determination of the reasonableness of oversight costs can include, but is not limited to, evaluation of documentary support (including information not already in the record) for requested oversight costs. The Assistant Executive Officer is authorized to amend this Order as necessary to include any undisputed oversight cost amounts or amounts derived through the dispute resolution process identified in Water Code section 13365, subdivision (c)(4) and determined to be owed by the discharger(s).

42. **PROCEDURAL MATTERS.** At the public hearing, the San Diego Water Board Cleanup Team objected to argument made by counsel for SDG&E during SDG&E's presentation as mischaracterizing Cleanup Team witnesses' deposition testimony. The Cleanup Team's objections are overruled. The San Diego Water Board has considered the deposition testimony and counsel's legal argument. The transcripts speak for themselves. Counsel's characterization of the Cleanup Team witnesses' deposition testimony took some of the deposition testimony out of context, but counsel was making legal argument and not testifying. Accordingly, it is not necessary to strike any portion of counsel's presentation. All exhibits introduced and marked during the hearing were accepted and are included in the administrative record.

ORDER DIRECTIVES

IT IS HEREBY ORDERED that, pursuant to sections 13267 and 13304 of the Water Code, National Steel and Shipbuilding Company; BAE Systems San Diego Ship Repair Inc.; the City of San Diego; Campbell Industries; San Diego Gas and Electric; the United States Navy; and the

San Diego Unified Port District (hereinafter Dischargers), shall comply with the following directives:

A. CLEANUP AND ABATE

1. **Illicit Discharges.** The Dischargers shall terminate all illicit discharges, if any, to the Shipyard Sediment Site (see Attachment 1) in violation of waste discharge requirements or other order or prohibition issued by the San Diego Water Board.
2. **Corrective Action.** The Dischargers shall take all corrective actions necessary to remediate the contaminated marine bay sediment at the Shipyard Sediment Site as described below: Corrective action design details shall be included in the Remedial Action Plan required by Directive B.
 - a. **Dredge Remedial Areas.** The sediments in the dredge remedial areas shown on Attachments 3 and 4 shall be dredged. This dredging shall remediate the sediment in the dredge remedial area to the concentrations in the table below for primary COCs, pursuant to confirmatory testing:

Primary COCs	Post-Remedial Dredge Area Concentrations (Background¹)
Copper	121 mg/kg
Mercury	0.57 mg/kg
HPAHs ²	663 µg/kg
PCBs ³	84 µg/kg
Tributyltin	22 µg/kg

1. See Finding 29, Table 1.
2. HPAHs = High Molecular Weight Polynuclear Aromatic Hydrocarbons, sum of 6 PAHs: Fluoranthene, Perylene, Benzo(a)anthracene, Chrysene, Benzo(a)pyrene, and Dibenzo(a,h)anthracene.
3. PCBs = Polychlorinated Biphenyls, 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.

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 concentration after completion of initial dredging, then additional sediments shall be dredged by performing an additional "pass" with the equipment. If concentrations of primary

COCs in subsurface sediments are below 120 percent of post-remedial dredge area concentrations, then the dredging is sufficient and may stop.

- b. ***Under-Pier Remedial Areas.*** The sediments in the under pier areas shown on Attachments 3 and 4 and other locations where significant impacts to infrastructure may occur shall be remediated by dredging, sand covering or other means.
- c. ***Post Remedial Surface-Area Weighted Average Concentrations.*** The Shipyard Sediment Site as shown in Attachment 2 shall be remediated to attain the following post remedial surface-area weighted average concentrations (“SWACs”):

Primary COCs	Predicted Post-Remedial SWACs
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.
- 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.

- 3. **MS4 Interim Mitigation Measures.** Immediately after adoption of the CAO, the City of San Diego and the San Diego Unified Port District within the tideland area shall take interim remedial actions, as necessary, to abate or correct the actual or potential effects of releases from the MS4 system that drains to outfall SW4. Interim remedial actions can occur concurrently with any phase of corrective action. Before taking interim remedial actions, the City and the Port District shall notify the San Diego Water Board of the proposed action and shall comply with any requirements that the San Diego Water Board sets.
- 4. **MS4 Investigation and Mitigation Plan.** The City of San Diego and the San Diego Unified Port District within the tideland area shall prepare and submit a municipal separate storm sewer system (MS4) Investigation and Mitigation Plan (Plan) within 90 days after adoption of the CAO. The Plan shall be designed to identify, characterize, and

mitigate pollutants and pollutant sources in the watershed that drains to the MS4 outfall SW-4 at the Shipyard Sediment Site and contain, at a minimum, the following information:

- a. **Site Conceptual Model.** The Plan shall contain a site conceptual model showing all of the current and former potential pollutant sources and pathways for pollutants to potentially enter the watershed that drains to the MS4 outfall SW-4.
- b. **Map.** A detailed map to scale showing the location and all elements of, and potential pollutant sources within, the MS4 system within the watershed that drains to the outfall SW-4.
- c. **Sampling and Analyses.** The Plan shall include sampling and analysis of the residual sediments within the MS4 system at key locations sufficient to characterize the sediments that will potentially be discharged to the Shipyard Sediment Site. The suite of chemical analyses must be adequate to identify the full range of site-specific waste constituents including, at a minimum, total PCB congeners, copper, mercury, lead, zinc, TPH, and HPAHs.
- d. **Sample Locations.** At a minimum, samples must be collected within all catch basins and similar junctions where accessible, and at intervals adequate to detect potential sources and no greater than approximately 500 feet within the streets in the storm water infrastructure within the SW-4 watershed. In addition, samples must be collected at locations designed to assess contributions from potential pollutant sources such as businesses with industrial activities or other pollutant-generating activities within the current SW-4 watershed. The Plan shall identify the number and location of the proposed sampling locations, and provide justification for the sampling intervals within the streets.
- e. **Sampling Protocols and Quality Assurance Project Plan (QAPP).** The Plan shall include the planned sampling protocols and a Quality Assurance Project Plan (QAPP) to assure that all environmental data generated scientifically valid and of acceptable quality to meet the Plan's objectives.
- f. **Mitigation.** The Plan shall include, at a minimum, the following mitigation activities:
 1. Removal and characterization of residual sediments in the MS4 system.
 2. Installation of structural treatment control best management practices (BMPs), where necessary and feasible, in the MS4 system to prevent or mitigate the entry of pollutants into the storm drains to the maximum extent practicable.
 3. Maintenance of BMPs, as necessary, to prevent degradation of their performance.

- g. **Activity Completion Schedule:** The Plan shall include a reasonable schedule for completion of all activities and submission of a final MS4 Investigation and Mitigation Report described in Directive A.5.

5. MS4 Investigation and Mitigation Implementation and Report

- a. **Implementation.** The City of San Diego and the San Diego Unified Port District within the tideland area shall implement the MS4 Investigation and Mitigation Plan according to the Activity Completion Schedule described in Directive 4.g.
- b. **MS4 Investigation and Mitigation Report.** The MS4 Investigation and Mitigation Report shall include the following:
 1. Sampling protocols implemented.
 2. Location, type, and number of samples shown on detailed site maps and tables.
 3. Concentration and interpreted lateral extent of each constituent.
 4. Mass of residual sediments removed from the MS4 system.
 5. Interpretations regarding the potential for the pollutants within the MS4 system to contaminate or re-contaminate the Shipyard Sediment Site during or after the remedial activities.
 6. Evaluation of the effectiveness of the mitigation activities implemented.
 7. Recommendations for additional investigation and mitigation activities.

B. REMEDIAL ACTION PLAN AND IMPLEMENTATION

1. **Remedial Action Plan.** The Dischargers shall prepare and submit a Remedial Action Plan (RAP) to the San Diego Water Board no later than 90 days after adoption of the CAO. The RAP shall be complete and contain the following information
 - a. **Introduction.** A brief description of the Shipyard Sediment Site and Site History.
 - b. **Selected Remedy.** A detailed description of all of the remedial activities selected to attain all cleanup levels in Directive A.2.
 - c. **Health and Safety Plan.** A Health and Safety Plan including employee training, protective equipment, medical surveillance requirements, standard operating procedures and contingency plans.
 - d. **Community Relations Plan.** A Community Relations Plan for informing the public about (i) activities related to the final remedial design, (ii) the schedule for the remedial action, (iii) the activities to be expected during construction and

- remediation, (iv) provisions for responding to emergency releases and spills during remediation, and (v) any potential inconveniences such as excess traffic and noise that may affect the community during the remedial action.
- e. *Quality Assurance Project Plan.* A Quality Assurance Project plan (QAPP) shall be included describing the project objectives and organization, functional activities, and quality assurance/quality control protocols as they relate to the remedial action
 - f. *Sampling and Analysis Plan.* A Sampling and Analysis Plan defining (i) sample and data collection methods to be used for the project, (ii) a description of the media and parameters to be monitored or sampled during the remedial action, and (iii) a description of the analytical methods to be utilized and an appropriate reference for each.
 - g. *Wastes Generated.* A description of the plans for management, treatment, storage and disposal of all wastes generated by the remedial action.
 - h. *Pilot Testing.* The results of bench scale or pilot scale studies or other data collected to provide sizing and operations criteria to optimize the remedial design.
 - i. *Design Criteria Report.* A Design Criteria Report that defines in detail the technical parameters upon which the remedial design will be based. Specifically, the Design Criteria Report shall include the preliminary design assumptions and parameters, including (i) waste characterization; (ii) volume and types of each medium requiring removal or containment; (iii) removal or containment schemes and rates, (iv) required qualities of waste streams (i.e., input and output rates to stockpiles, influent and effluent qualities of any liquid waste streams such as dredge spoil return water, potential air emissions, and so forth); (v) performance standards; (v) compliance with applicable local, State and federal regulations; (vi) technical factors of importance to the design, construction, and implementation of the selected remedy including use of currently accepted environmental control measures, constructability of the design, and use of currently acceptable construction practices and techniques.
 - j. *Equipment, Services, and Utilities.* A list of any elements or components of the selected remedial action that will require custom fabrication or long lead time for procurement. The list shall state the basis for such need, and the recognized sources of such procurement.
 - k. *Regulatory Permits and Approvals.* A list of required federal, State and local permits or approvals to conduct the remedial action.
 - l. *Remediation Monitoring Plan.* A Remediation Monitoring Plan consisting of (i) water quality monitoring, (ii) sediment monitoring, and (iii) disposal monitoring consistent with Section 34.1 of the Technical Report. The water quality monitoring must be sufficient to demonstrate that implementation of the selected remedial activities do not result in violations of water quality standards outside the construction area. The sediment monitoring must be sufficient to confirm that the selected

- remedial activities have achieved target cleanup levels within the remedial footprint specified in Directive A.2. The disposal monitoring must be sufficient to adequately characterize the dredged sediments in order to identify appropriate disposal options.
- m. *Site Map*. A site map showing the location of buildings, roads, property boundaries, remedial equipment locations and other information pertinent to the remedial action.
 - n. *Contingencies*. A description of any additional items necessary to complete the RAP.
 - o. *Remediation Schedule*. A schedule detailing the sequence of events and time frame for each activity based on the shortest practicable time required to complete each activity. The initiation and completion of each activity must be no longer than the durations described in Attachment 5.
2. **RAP Implementation**. In the interest of promoting prompt cleanup, the Discharger may begin implementation of the RAP 60 calendar days after submittal to the San Diego Water Board, unless otherwise directed in writing by the San Diego Water Board. The Dischargers shall complete implementation of the RAP based on the schedule in the RAP. Before beginning RAP implementation activities, the Dischargers shall:
- a. Notify the San Diego Water Board of its intention to begin cleanup; and
 - b. Comply with any conditions set by the San Diego Water Board, including mitigation of adverse consequences from cleanup activities.
 - c. The Dischargers shall modify or suspend cleanup activities when directed to do so by the San Diego Water Board.

C. CLEANUP AND ABATEMENT COMPLETION VERIFICATION

Final Cleanup and Abatement Completion Report. The Dischargers shall submit a final Cleanup and Abatement Completion Report verifying completion of the RAP activities for the Shipyard Sediment Site within 90 days of completion of remediation. The report shall provide a demonstration, based on a sound technical analysis, that sediment quality cleanup levels in Directive A.2 have been achieved.

D. POST REMEDIAL MONITORING

1. **Post Remedial Monitoring Plan**. The Dischargers shall prepare and submit a Post Remedial Monitoring Plan to the San Diego Water Board no later than 90 days after adoption of this CAO. The Post Remedial Monitoring Plan shall be designed to verify that the remaining pollutant concentrations in the sediments will not unreasonably affect San Diego Bay beneficial uses. At a minimum the Post Remedial Monitoring Plan shall include the following elements:
 - a. *Quality Assurance Project Plan*. A Quality Assurance Project plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the post remediation monitoring.

- b. *Sampling and Analysis Plan.* A Sampling and Analysis Plan defining (i) sample and data collection methods to be used for the post radiation monitoring, (ii) a description of the media and parameters to be monitored or sampled, and (iii) a description of the analytical methods to be utilized and an appropriate reference for each.
- c. *Sediment Chemistry.* Site-wide post-remedial SWACs for the five primary COCs (copper, mercury, TBT, PCBs, and HPAH) shall be confirmed through composite sampling of the entire Shipyard Sediment Site. Samples shall be collected at all 65 sampling stations used to develop Thiessen polygons and composited on a surface area weighted basis into 6 polygon groups as shown in Attachment 6.
 1. To prepare the composite samples, the 65 station locations within the six polygon groups shall be sampled. The volume of the sample at each station shall be proportional to the area of the polygon the station represents. These samples shall be collected from the 0-2 cm depth interval. Two (2) grab samples shall be composited in the field at each station.
 2. The individual samples shall be combined into six (6) composite samples representing the six (6) polygon groups as shown in Attachment 6. Three (3) replicates shall be taken from each of these six (6) composite samples and analyzed for PCBs, copper, mercury, HPAHs, and TBT, and sediment conventional parameters (e.g., grain size, TOC, ammonia). See Attachment 7 for the required list of PCB and HPAH analytes.
 3. The average concentration of each of the six (6) composites shall be calculated from the analytical results of the replicates for each COC. The average concentrations represent SWACs for each of the six (6) polygon groups.
 4. The three replicate sub-samples of composite samples provide an estimate of variances in the compositing process. Sample material from the 65 station-specific composite samples shall be archived for potential future analysis.
 5. The mean concentration for each of the six (6) composite groups shall be used to calculate Site-Wide SWACs for each COC.
 6. SWAC trigger concentrations shall be used to evaluate whether Site-Wide SWACs exceed the Predicted Post-Remedial SWACs, and whether further action is needed. These concentrations represent the surface-area weighted average concentration expected after cleanup, accounting for the variability in measured concentrations throughout the area. If the Site-Wide SWAC after remediation is below the trigger concentration then remediation shall be considered successful. Exceedance of the trigger concentration shall result in further evaluation of the site-specific conditions to determine if the remedy was successful as detailed in Directive D.3. The trigger concentrations for the primary COCs are listed below.

Primary COCs	Trigger Concentrations
Copper	185 mg/kg
Mercury	0.78 mg/kg
HPAHs ¹	3,208 µg/kg
PCBs ²	253 µg/kg
Tributyltin	156 µg/kg

1. HPAHs = sum of 6 PAHs: Fluoranthene, Perylene, Benzo[a]anthracene, Chrysene, Benzo[a]pyrene, and Dibenzo[a,h]anthracene.
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.

- d. **Bioaccumulation Testing.** Nine (9) sediment samples shall undergo bioaccumulation testing using the 28-day *Macoma nasuta* test. The samples selected for bioaccumulation testing shall be from stations SW04, SW08, SW13, SW21, SW28, and NA06, NA11, NA12, and NA20. Tissue samples shall be analyzed for arsenic, cadmium, copper, lead, mercury, zinc, HPAHs, and PCBs. See Attachment 7 for the required list of PCB and HPAH analytes.
- e. **Sediment Chemistry for Benthic Exposure.** Samples shall be collected for chemical analyses at the following five station locations: SW04, SW13, SW22, SW23 and NA19. Sediments shall be analyzed for sediment conventional parameters (e.g., grain size, TOC, ammonia) and the following: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc, TBT, PCBs, and PAHs. See Attachment 7 for the required list of PCB and PAH analytes. Results from the chemical analyses shall be evaluated in accordance with the flow diagram in Attachment 8 to determine if further evaluation or action is necessary based on benthic effects indicators. SS-MEQ values shall be determined for each station and compared to the 0.9 SS-MEQ threshold. The sediment chemistry results shall be compared to the 60% LAET thresholds.
- f. **Sediment Toxicity.** Sediment samples shall be collected for toxicity analyses at the following five station locations: SW04, SW13, SW22, SW23, and NA19. Two types of sediment toxicity tests shall be conducted in accordance with protocols recommended by the San Diego Water Board: (1) 10-day amphipod survival test using *Eohaustorius estuarius* exposed to whole sediment, and (2) 48-hour bivalve larva development test using the mussel *Mytilus galloprovincialis* exposed to whole sediment at the sediment-water interface. Results from the toxicity analyses shall be evaluated in accordance with the flow diagram in Attachment 9 to determine if further evaluation or action is necessary based on benthic effects indicators.

1. Year 2 Remedial Goals

- Composite site-wide SWACs below the Trigger Concentrations identified in D.1.c.6. above; and
- Sediment chemistry below SS-MEQ and 60%LAET thresholds; and
- Toxicity not significantly different from conditions at the reference stations described in Finding 17 and in the *Technical Report for Cleanup and Abatement Order No. R9-2012-0024 for the Shipyard Sediment Site, San Diego Bay, San Diego, CA*; and
- The average of stations sampled shows bioaccumulation levels below the pre-remedial levels.

2. Year 5 Remedial Goals

- Composite site-wide SWACs below the Trigger Concentrations identified in D.1.c.6. above; and
- Sediment chemistry below SS-MEQ and 60%LAET thresholds; and
- Toxicity not significantly different from conditions at the reference stations described in Finding 17 and as defined in the *Technical Report for Cleanup and Abatement Order No. R9-2012-0024 for the Shipyard Sediment Site, San Diego Bay, San Diego, CA*; and
- The average of stations sampled shows bioaccumulation levels continuing to decrease below the pre-remedial levels and equal to or below the Year 2 post-remedial monitoring sampling event levels.

3. Confirm remedial goals are maintained at year 10 (if goals were not met in year 5)

- Composite site-wide SWACs below the Trigger Concentrations identified in D.1.c.6. above; and
- Sediment chemistry below SS-MEQ and 60%LAET thresholds; and
- Toxicity not significantly different from conditions at the reference stations described in Finding 17 and defined in the *Technical Report for Cleanup and Abatement Order No. R9-2012-0024 for the Shipyard Sediment Site, San Diego Bay, San Diego, CA*; and
- The average of stations sampled shows bioaccumulation levels below the pre-remedial levels and equal to or below the Year 5 post-remedial monitoring sampling event levels.

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 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. **Exceedance Investigation and Characterization Report.** The Dischargers shall prepare and submit an adequate 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

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. REPORTS AND WORKPLANS

The Dischargers shall prepare and submit all required plans and reports described in Directives B, C, and D of this Order to the San Diego Water Board for review and approval. The San Diego Water Board shall make these plans/reports available to the public for comment. If comments or concerns on these plans and reports are not resolved informally, then the Assistant Executive Officer will schedule the item for San Diego Water Board consideration at a public meeting.

G. 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. However, the portion of polygon SW29 not in the dredge footprint may be addressed by the San Diego Water Board under a separate future regulatory action based upon available information.

H. 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 \$168,173 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, including contact information, authorized by the Dischargers to receive and pay future 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 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.
 - A transmittal letter that must indicate whether or not all the analytical work was supervised by the director of the laboratory, and contain the following statement, “All analyses were conducted at a laboratory certified for such analyses by the California Department of Health Services in accordance with current USEPA procedures.”
5. **Duty to Operate and Maintain.** The Dischargers shall, at all times, properly operate and maintain all facilities and systems of treatment, control, storage, disposal and monitoring (and related appurtenances) which are installed or used by the Dischargers to achieve compliance with this CAO. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities, which are installed by the Dischargers only when the operation is necessary to achieve compliance the conditions of this CAO.
6. **Field Work Notice.** The Dischargers shall give the San Diego Water Board at least fourteen (14) days advance notice of all field work or field activities to be performed by the Dischargers pursuant to this CAO; provided, however, that in a given instance, if it is impossible for the Dischargers to provide such notice, the Dischargers shall provide notice to the San Diego Water Board of all such field work or activities as far in advance of such work as is possible. In any event, any notification pursuant to this Provision shall be given at least twenty-four (24) hours prior to the given field activities, unless the San Diego Water Board agrees otherwise.
7. **Duty to Use Registered Professionals.** The Dischargers shall provide documentation that plans and reports required under this CAO are prepared under the direction of appropriately qualified professionals. California Business and Professions Code sections 6735, 7835 and 7835.1 require that engineering and geologic evaluations and judgments be performed by or under the direction of registered professionals. A statement of qualifications and registration numbers of the responsible lead professionals shall be included in all plans and reports submitted by the Dischargers. The lead professional shall sign and affix their registration stamp to the report, plan or document.
8. **Corporate Signatory Requirements.** All reports required under this Order shall be signed and certified by a responsible corporate officers of the Dischargers described in paragraph 5.a. of this provision or by a duly authorized representative of that person as described in paragraph 5.b.of this provision.
- a. **Responsible Corporate Officer(s).** For the purposes of this provision, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who

performs similar policy - or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

b. ***Duly Authorized Representative.*** A person is a duly authorized representative only if

1. The authorization is made in writing by a person described in paragraph (a) of this provision;
2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and
3. The written authorization is submitted to the San Diego Water Board.

c. ***Changes to Authorization.*** If an authorization under paragraph (b) of this provision is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this provision must be submitted to the San Diego Water Board prior to or together with any reports or information to be signed by an authorized representative.

d. ***Certification Statement.*** Any person signing a document under paragraph a. or b. of this provision shall make the following certification:

”I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

9. ***Duty to Submit Other Information.*** When the Dischargers become aware that it failed to submit any relevant facts in any report required under this CAO, or submitted incorrect

information in any such report, the Dischargers shall promptly submit such facts or information to the San Diego Water Board.

10. **Electronic and Paper Media Reporting Requirements.** The Dischargers shall submit both electronic and paper copies of all reports required under this CAO including work plans, technical reports, and monitoring reports. Larger documents shall be divided into separate files at logical places in the report to keep file sizes under 150 megabytes. The Discharger shall continue to provide a paper transmittal letter, a paper copy of all figures larger than 8.5 inches by 14 inches (legal size), and an electronic copy (on CD or other appropriate media) of all reports to the San Diego Water Board. All paper correspondence and documents submitted to the San Diego Water Board must include the following identification numbers in the header or subject line: Geotracker Site ID: T10000003580. The Dischargers shall comply with the following reporting requirements for all reports and plans (and amendments thereto) required by this Order:

- a. **Reports and Plans Required by this Order.** The Dischargers shall submit one paper and one electronic, searchable PDF copy of all technical reports, monitoring reports, progress reports, and plans required by this Order. The PDF copy of all the reports shall also be uploaded into the Geotracker database, as required by Provision G.10(b)(4) below.
- b. **Electronic Data Submittals for Sediment Chemistry.** All information submitted to the San Diego Water Board in compliance with this Order is required to be submitted electronically via the Internet into the Geotracker database <http://geotracker.waterboards.ca.gov/> (Geotracker Site ID. T10000003580). The electronic data shall be uploaded on or prior to the regulatory due dates set forth in the Order or addenda thereto. To comply with these requirements, the Dischargers shall upload to the Geotracker database the following minimum information:
 1. **Laboratory Analytical Data:** Analytical data (including geochemical data) for all sediment and water samples in Electronic Data File (EDF) format. Water, sediment, and soil include analytical results of samples collected from: dredging equipment, monitoring wells, boreholes, gas and vapor wells or other collection devices, surface water, groundwater, piezometers, and stockpiles.
 2. **Locational Data:** The latitude and longitude of any permanent monitoring location (surface water or sediment sampling location) for which data is reported in EDF format, accurate to within 1 meter and referenced to a minimum of two reference points from the California Spatial Reference System (CSRS-H), if available.
 3. **Site Map:** Site map or maps which display discharge locations, streets bordering the facility, and sampling locations for all sediment, soil, and water samples. The site map is a stand-alone document that may be submitted in various electronic formats. A site map must also be uploaded to show the maximum extent of any sediment and water pollution. An update to the site map may be uploaded at any time.

4. **Electronic Report:** A complete copy (in searchable PDF format) of all workplans, assessment, cleanup, and monitoring reports including the signed transmittal letters, professional certifications, and all data presented in the reports.
11. **Report Submittals.** All monitoring and technical reports required under this CAO shall be submitted to

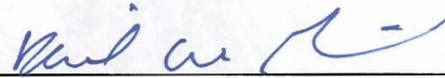
Executive Officer
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340
12. **Amendment.** This CAO in no way limits the authority of this San Diego Water Board to institute additional enforcement actions or to require additional investigation and cleanup consistent with the California Water Code. This CAO may be revised by the San Diego Water Board as additional information becomes available.
13. **Time Extensions.** If, for any reason, the Dischargers are unable to perform any activity or submit any documentation in compliance with requirements in this CAO, including the RAP, or in compliance with associated implementation schedules, including the RAP implementation schedule, the Dischargers may request, in writing, an extension of time. The written extension request shall include justification for the delay and shall be received by the San Diego Water Board reasonably (but not less than 15 calendar days) in advance of the deadline sought to be extended. An extension may be granted for good cause, in which case this CAO will be accordingly amended.
14. **Community Relations.** The Dischargers shall cooperate with the San Diego Water Board in providing information regarding the remediation of the Shipyard Sediment Site to the public. If requested by the San Diego Water Board, the Dischargers shall participate in the preparation of such information for distribution to the public and in public meetings which may be held or sponsored by the San Diego Water Board to explain activities at or relating to the Shipyard Sediment Site.

I. NOTIFICATIONS

1. **Enforcement Discretion.** The San Diego Water Board reserves its right to take any enforcement action authorized by law for violations of the terms and conditions of this CAO.
2. **Enforcement Notification.** The Porter-Cologne Water Quality Control Act commencing with Chapter 5, Enforcement and Implementation, section 13308, provides that if there is a threatened or continuing violation of a CAO, the San Diego Water Board may issue a Time Schedule Order prescribing a civil penalty in an amount not to exceed \$10,000 per day for each day compliance is not achieved in accordance with that time schedule. Section 13350 provides that any person may be assessed administrative civil liability by the San Diego Water Board for violating a CAO in an amount not to exceed \$5,000 for

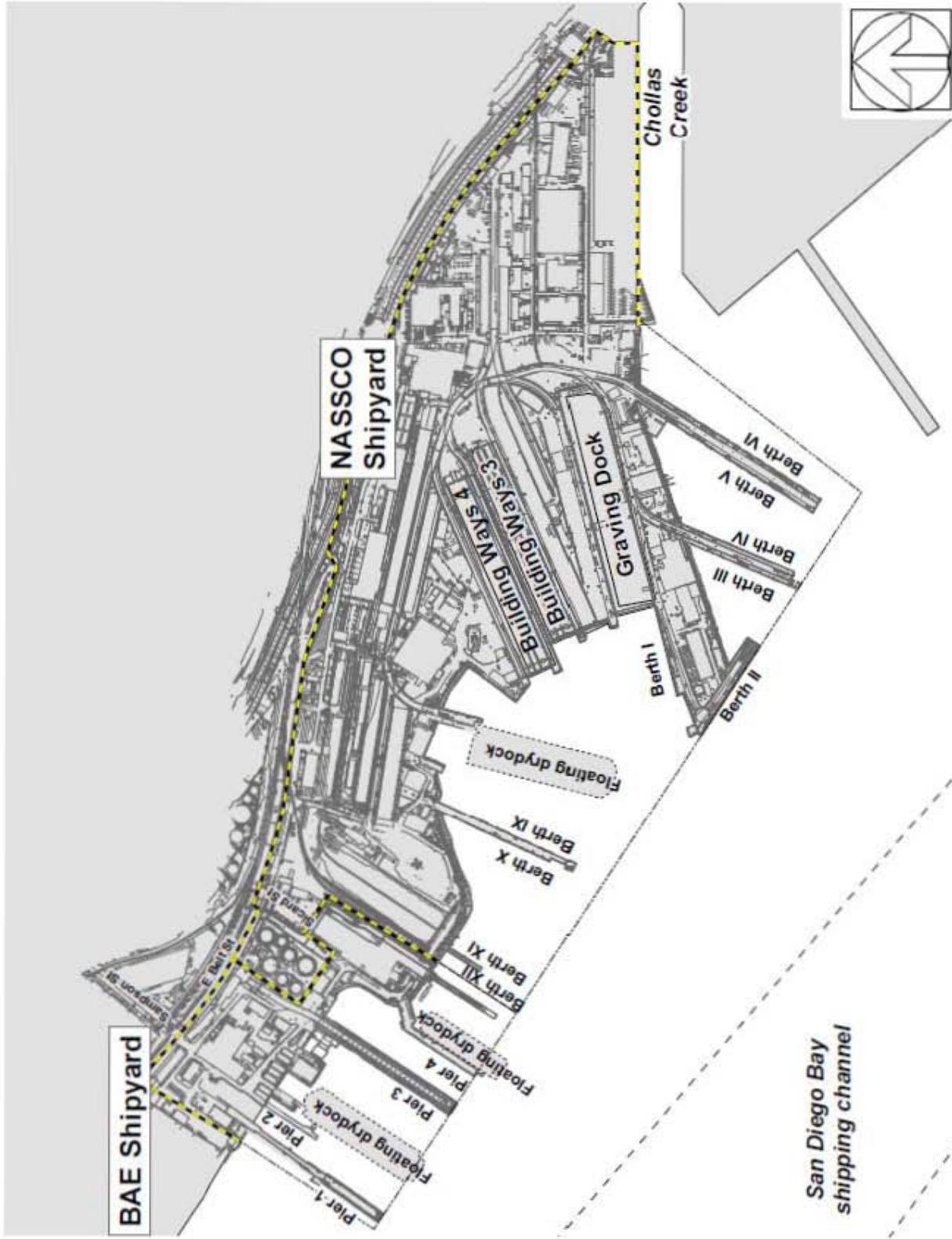
each day the violation occurs, or on a per gallon basis, not to exceed \$10 for each gallon of waste discharged. Alternatively the court may impose civil liability in an amount not to exceed \$15,000 for each day the violation occurs, or on a per gallon basis, not to exceed \$20 for each gallon of waste discharged. Section 13385 provides that any person may be assessed administrative civil liability by the San Diego Water Board for violating a CAO for an activity subject to regulation under Division 7, Chapter 5.5 of the Water Code, in an amount not to exceed the sum of both of the following: (1) \$10,000 for each day in which the violation occurs; and (2) where there is a discharge, any portion of which is not susceptible to cleanup or is not cleaned up, and the volume discharged but not cleaned up exceeds 1,000 gallons, an additional liability not to exceed \$10 multiplied by the number of gallons by which the volume discharged but not cleaned up exceeds 1,000 gallons. Alternatively the civil liability may be imposed by the court in an amount not to exceed the sum of both of the following: (1) \$25,000 for each day in which the violation occurs; and (2) where there is a discharge, any portion of which is not susceptible to cleanup or is not cleaned up, and the volume discharged but not cleaned up exceeds 1,000 gallons, an additional liability not to exceed \$25 multiplied by the number of gallons by which the volume discharged but not cleaned up exceeds 1,000 gallons.

I, David W. Gibson, Executive Officer, do hereby certify the forgoing is a full, true, and correct copy of a CAO issued on March 14, 2012.

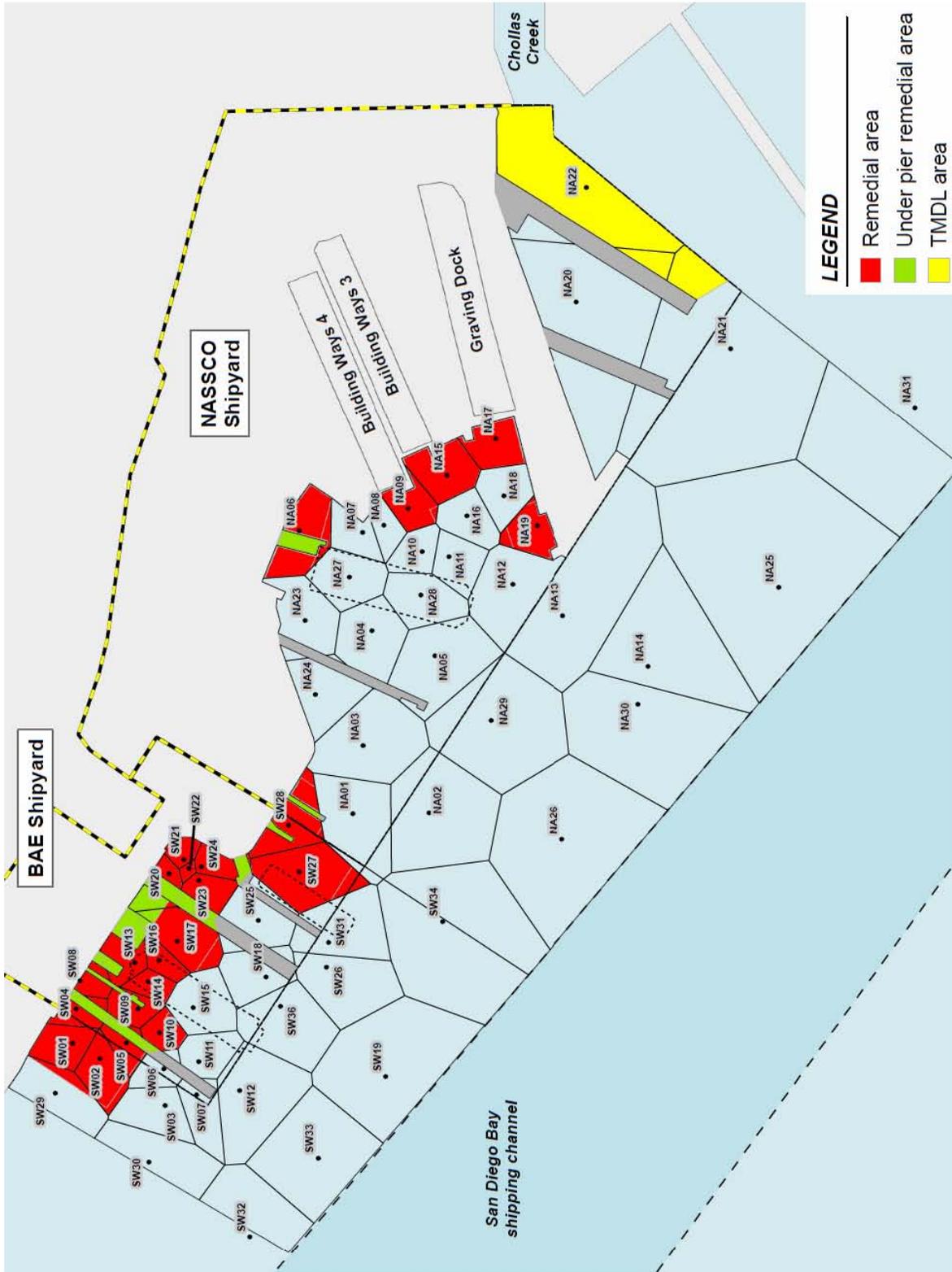


David W. Gibson
Executive Officer

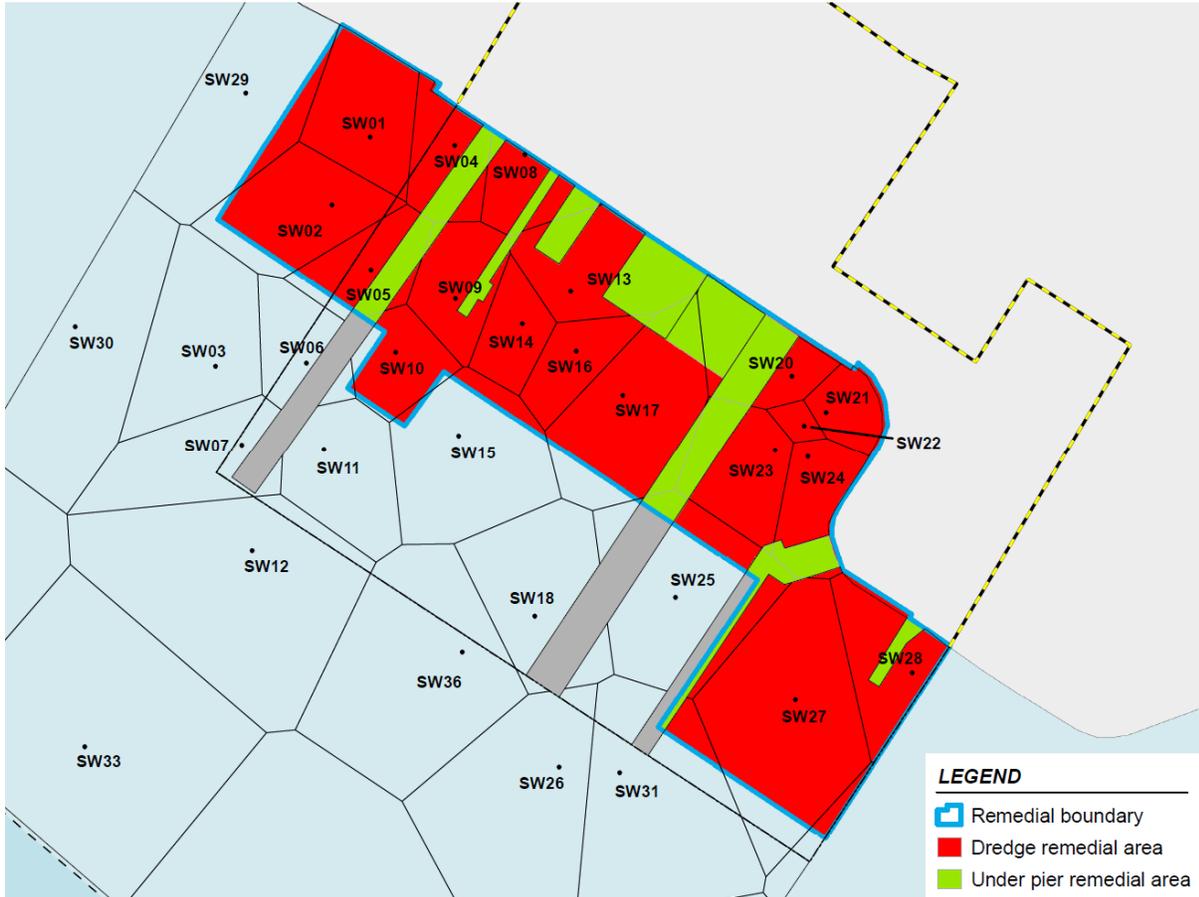
Attachment 1. Shipyard Sediment Area



Attachment 2. Polygons Targeted for Remediation

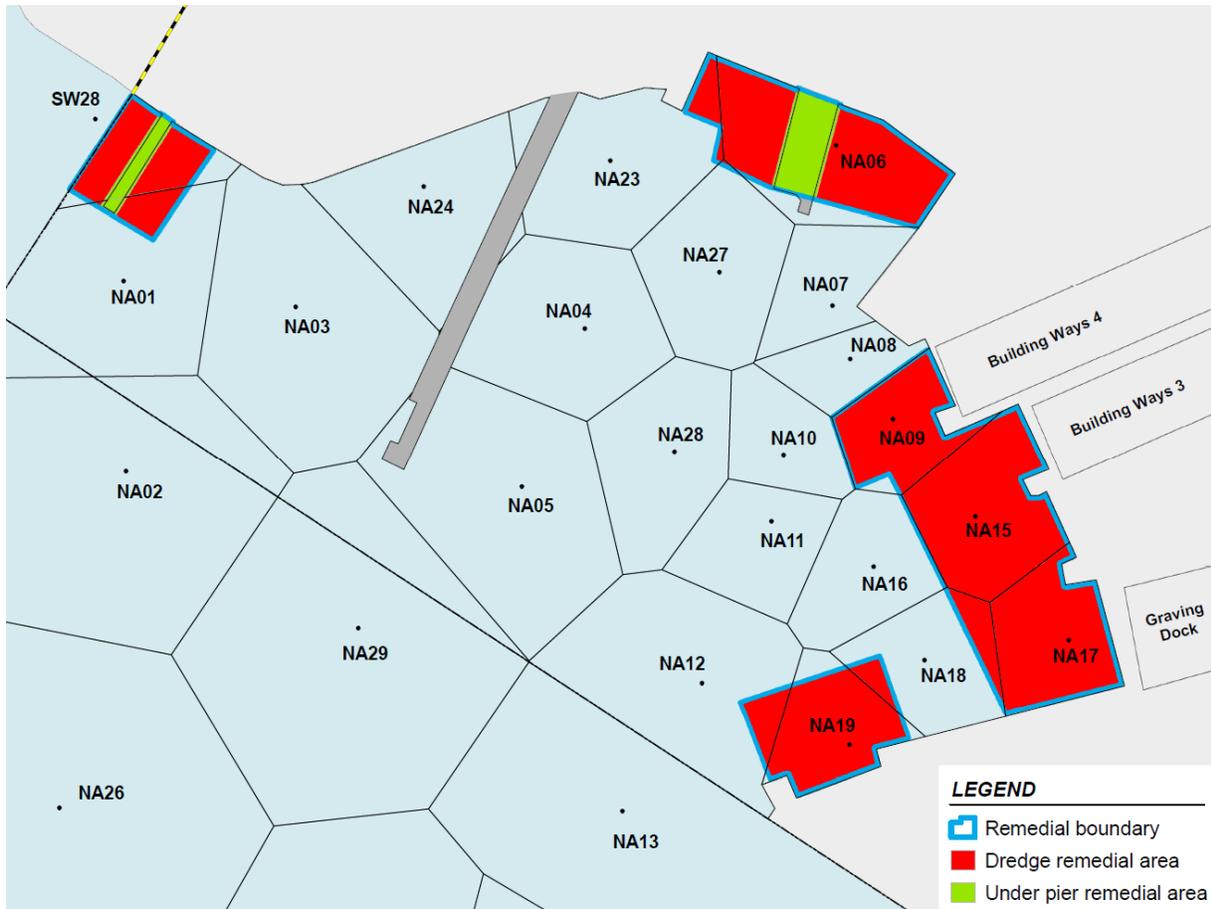


Attachment 3. Remedial Footprint Based on Sediment Management Units for BAE Shipyard



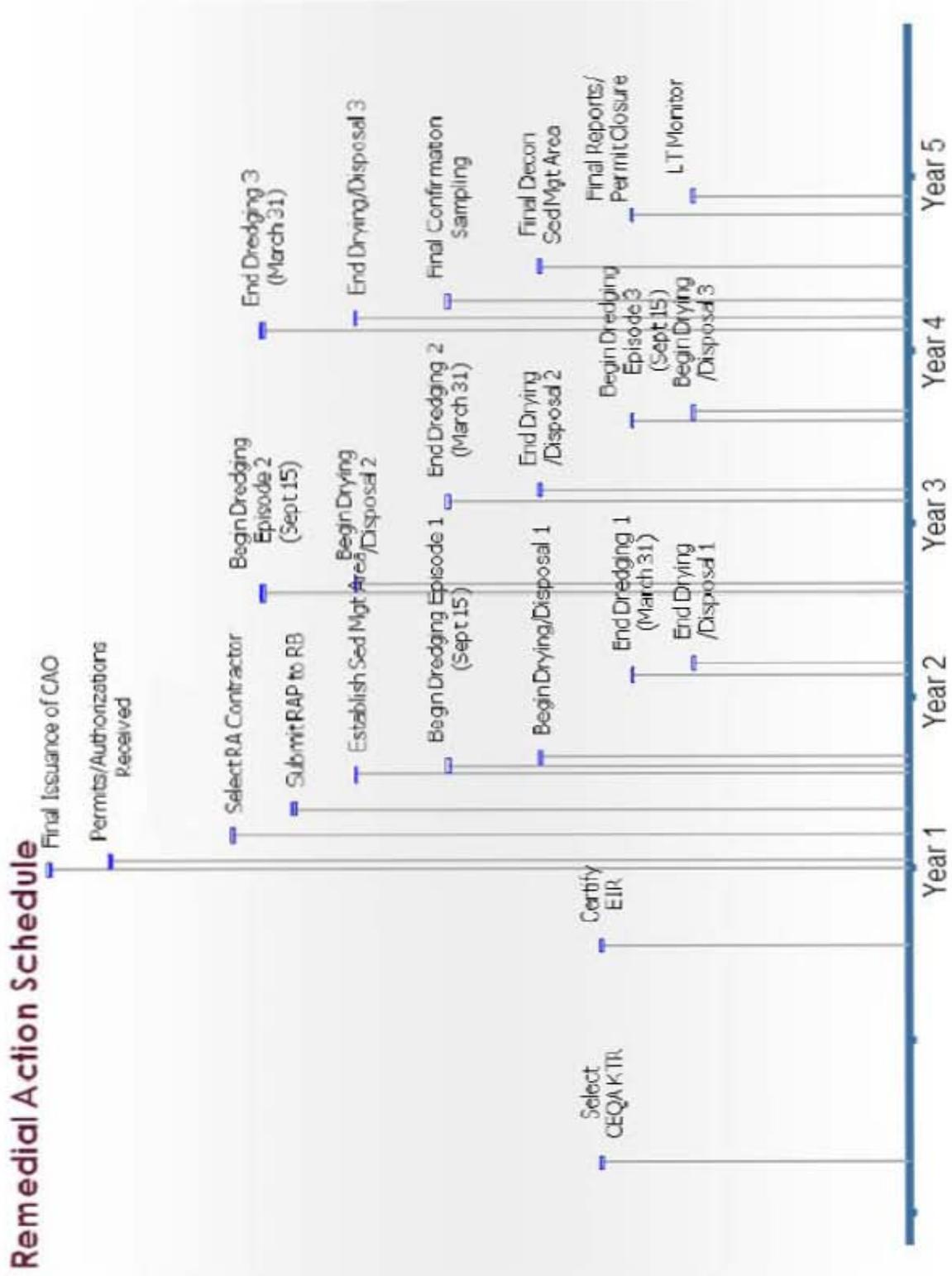
Remedial Site (North)	
Dredge remedial Area (ft ²)	438,300
Under pier remedial area (ft ²)	89,980
Total Remedial Area (ft ²)	528,295
Dredge Volume (yd ³)	90,800
Note: Presumed remedy within the remedial boundary is dredging, except for under pier remedial areas.	

Attachment 4. Remedial Footprint Based on Sediment Management Units for NASSCO Shipyard

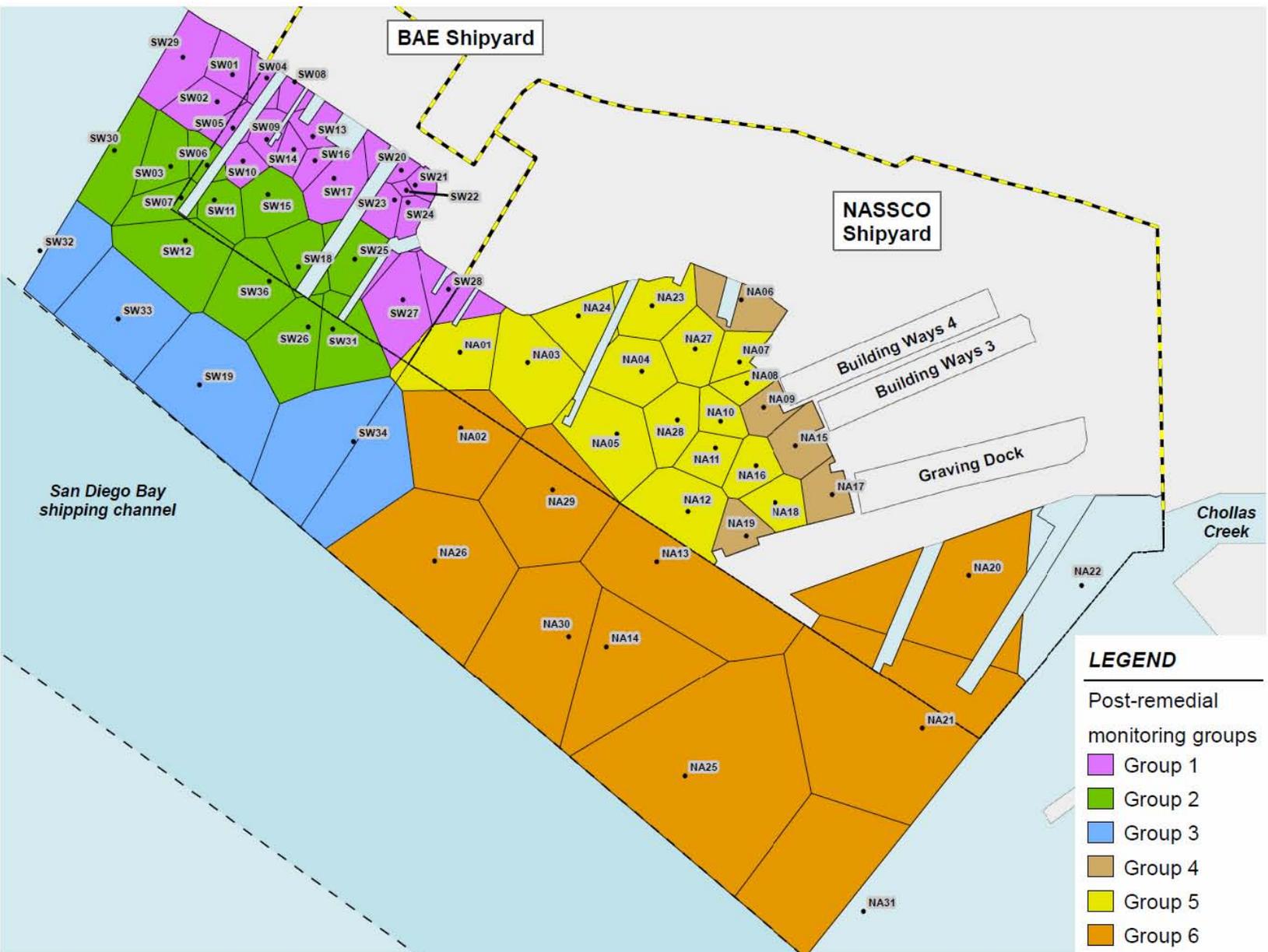


Remedial Site (South)	
Dredge remedial Area (ft ²)	217,800
Under pier remedial area (ft ²)	13,725
Total Remedial Area (ft ²)	231,495
Volume (yd ³)	52,600
TMDL area (ft ²)	218,060
Note: Presumed remedy within the remedial boundary is dredging, except for under pier remedial areas.	

Attachment 5. Remedial Action Implementation Schedule



Attachment 6. Composite Sampling Area for Post-Remedial Monitoring



Attachment 7. Summed list of PCB and PAH analytes measured in bulk sediments.

PAH	Identifier	PAH	Identifier
Naphthalene	C0N	Pyrene	PYR
C1-Naphthalenes	C1N	C1-Fluoranthenes/pyrenes	C1F/P
C2-Naphthalenes	C2N	C2-Fluoranthenes/pyrenes	C2F/P
C3-Naphthalenes	C3N	C3-Fluoranthenes/pyrenes	C3F/P
C4-Naphthalenes	C4N	Benzo[a]anthracene	BAA
Acenaphthylene	ACEY	Chrysene	C0C
Acenaphthene	ACE	C1-Chrysenes	C1C
Biphenyl	BIP	C2-Chrysenes	C2C
Fluorene	C0F	C3-Chrysenes	C3C
C1-Fluorenes	C1F	C4-Chrysenes	C4C
C2-Fluorenes	C2F	Benzo[b]fluoranthene	BBF
C3-Fluorenes	C3F	Benzo[k]fluoranthene	BKF
Anthracene	C0A	Benzo[e]pyrene	BEP
Phenanthrene	C0P	Benzo[a]pyrene	BAP
C1-Phenanthrenes/anthracenes	C1P/A	Perylene	PER
C2-Phenanthrenes/anthracenes	C2P/A	Indeno[1,2,3,-c,d]pyrene	INDENO
C3-Phenanthrenes/anthracenes	C3P/A	Dibenzo[a,h]anthracene	DAH
C4-Phenanthrenes/anthracenes	C4P/A	Benzo[g,h,i]perylene	BGP
Dibenzothiophene	C0D	Total PAH ¹	TPAH
C1-Dibenzothiophenes	C1D	Priority Pollutant PAH ²	PPPAH
C2-Dibenzothiophenes	C2D	Low Molecular Weight PAH ³	LMWPAH
C3-Dibenzothiophenes	C3D	High Molecular Weight PAH ⁴	HMWPAH
Fluoranthene	FLANT		

SCCWRP and U.S. Navy, 2005b

¹Total PAH = sum of all listed PAH analytes

²Priority pollutant PAH = sum of C0N, ACEY, ACE, C0F, C0A, C0P, FLANT, PYR, BAA, C0C, BBF, BKF, BAP, INDENO, DAH, BGP

³Low Molecular Weight PAH = sum of C0N, C2N, ACEY, ACE, C0F, C0A, C0P

⁴High Molecular Weight PAH = sum of FLANT, PYR, BAA, C0C, BAP, DAH

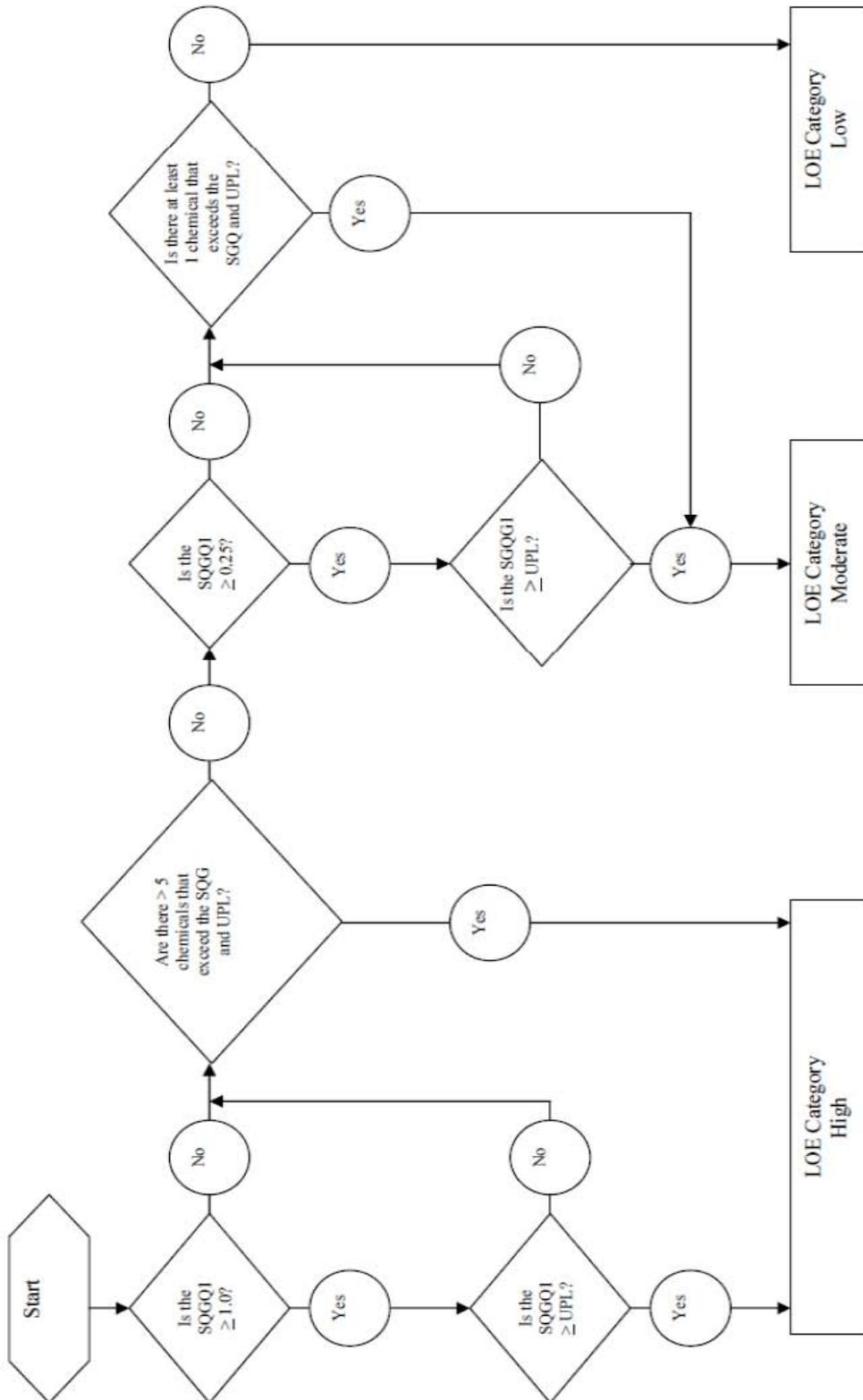
Attachment 7 (continued). Summed list of PCB and PAH analytes measured in bulk sediments.

PCB Congener	Congener Number	PCB Congener	Congener Number
2,2',5-Trichlorobiphenyl (Cl3)	18	2,2',3,3',4,4'-Hexachlorobiphenyl (Cl6)	128
2,4,4'-Trichlorobiphenyl (Cl3)	28	2,2',3,4,4',5'-Hexachlorobiphenyl (Cl6)	138
3,4,4'-Trichlorobiphenyl (Cl3)	37	2,2',3,4',5',6-Hexachlorobiphenyl (Cl6)	149
2,2',3,5'-Tetrachlorobiphenyl (Cl4)	44	2,2',3,5,5',6-Hexachlorobiphenyl (Cl6)	151
2,4,4',5'-Tetrachlorobiphenyl (Cl4)	49	2,2',4,4',5,5'-Hexachlorobiphenyl (Cl6)	153
2,2',5,5'-Tetrachlorobiphenyl (Cl4)	52	2,3,3',4,4',5-Hexachlorobiphenyl (Cl6)	156
2,3',4,4'-Tetrachlorobiphenyl (Cl4)	66	2,3,3',4,4',5'-Hexachlorobiphenyl (Cl6)	157
2,3',4',5 - Tetrachlorobiphenyl (Cl4)	70	2,3,3',4,4',6-Hexachlorobiphenyl (Cl6)	158
2,4,4',5 -Tetrachlorobiphenyl (Cl4)	74	2,3',4,4',5,5'-Hexachlorobiphenyl (Cl6)	167
3,4,4',5 -Tetrachlorobiphenyl (Cl4)	81	2,3',4,4',5',6-Hexachlorobiphenyl (Cl6)	168
3,3',4,4'-Tetrachlorobiphenyl (Cl4)	77	3,3',4,4',5,5'-Hexachlorobiphenyl (Cl6)	169
2,2',3,4,5'-Pentachlorobiphenyl (Cl5)	87	2,2',3,3',4,4',5-Heptachlorobiphenyl (Cl7)	170
2,2',4,4',5-Pentachlorobiphenyl (Cl5)	99	2,2',3,3',4,5',6'-Heptachlorobiphenyl (Cl7)	177
2,2',4,5,5'-Pentachlorobiphenyl (Cl5)	101	2,2',3,4,4',5,5'-Heptachlorobiphenyl (Cl7)	180
2,3,3',4,4'-Pentachlorobiphenyl (Cl5)	105	2,2',3,4,4',5',6-Heptachlorobiphenyl (Cl7)	183
2,3,3',4,6-Pentachlorobiphenyl (Cl5)	110	2,2',3,4',5,5',6-Heptachlorobiphenyl (Cl7)	187
2,3,4,4',5-Pentachlorobiphenyl (Cl5)	114	2,3,3',4,4',5,5'-Heptachlorobiphenyl (Cl7)	189
2,3',4,4',5-Pentachlorobiphenyl (Cl5)	118	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (Cl8)	194
2,3',4,4',6-Pentachlorobiphenyl (Cl5)	119	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (Cl8)	201
2,3',4,4',5'-Pentachlorobiphenyl (Cl5)	123	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (Cl9)	206
3,3',4,4',5-Pentachlorobiphenyl (Cl5)	126	Total PCB ¹	TPCB

SCCWRP and U.S. Navy, 2005b

¹Total PCB = sum of all listed PCB congeners.

Attachment 8. Flow Diagram for the Sediment Chemistry Ranking Criteria (Low, Moderate, and High)



Attachment 9. Flow Diagram for the Toxicity Ranking Criteria (Low, Moderate, and High)

