

TENTATIVE

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

TENTATIVE CLEANUP AND ABATEMENT ORDER

NO. R9-2005-0126

NATIONAL STEEL AND SHIPBUILDING COMPANY

**BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.
(FORMERLY SOUTHWEST MARINE, INC.)**

CITY OF SAN DIEGO

**MARINE CONSTRUCTION AND DESIGN COMPANY
AND CAMPBELL INDUSTRIES, INC.**

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

UNITED STATES NAVY

SHIPYARD SEDIMENT SITE

SAN DIEGO BAY

SAN DIEGO, CALIFORNIA

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board), finds that:

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 in an area extending approximately from the Sampson Street Extension to the north and Chollas Creek to the south and from the National Steel and Shipbuilding Company Shipyard facility (hereinafter “NASSCO”) and the BAE Systems San Diego Ship Repair Facility (hereinafter “BAE Systems”) 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”. NASSCO; BAE Systems San Diego Ship Repair, Inc.; City of San Diego; Marine Construction and Design Company and Campbell Industries, Inc.; San Diego Gas and Electric, a subsidiary of Sempra Energy Company; and the United States Navy have each caused or permitted the discharge of pollutants/waste to the Shipyard Sediment Site resulting in the accumulation of pollutants/waste in the marine sediment. The contaminated marine sediment ~~threatens to cause~~has caused conditions of pollution, contamination, ~~and or~~ nuisance in San Diego Bay that adversely affects aquatic life, aquatic-dependent wildlife, human health, and San Diego Bay beneficial uses. A map of the Shipyard Sediment Site region is provided in Attachment 1 to this Order.

PERSONS RESPONSIBLE

- 2. NATIONAL STEEL AND SHIPBUILDING COMPANY (NASSCO), A SUBSIDIARY OF GENERAL DYNAMICS COMPANY.** The National Steel and Shipbuilding Company, (hereinafter NASSCO) has (1) ~~caused or permitted~~discharged waste from its shipyard operations ~~to be discharged in~~ into San Diego Bay in violation of waste discharge requirements; and (2) caused or permitted waste to be discharged or deposited ~~waste~~ where it was discharged into San Diego Bay ~~creating and created~~, or ~~threatening~~threatens 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). Based on these considerations NASSCO is referred to as “Discharger(s)” in this Cleanup and Abatement Order.

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 San Diego Unified Port District (SDUPD) 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 1945. 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 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.

- 3. BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC., FORMERLY SOUTHWEST MARINE, INC.-** BAE Systems San Diego Ship Repair, Inc. has (1) ~~caused or permitted~~discharged waste from its shipyard operations ~~to be discharged~~ into San Diego Bay in violation of waste discharge requirements; and (2) ~~caused or permitted waste to be discharged or deposited~~ waste where it was discharged into San Diego Bay ~~creating and created~~, or ~~threatening~~threatens 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). Based on these considerations BAE Systems San Diego Ship Repair, Inc. is referred to as “Discharger(s)” in this Cleanup and Abatement Order.

From 1979 to the present, Southwest Marine, Inc. and its successor BAE Systems San Diego Ship Repair, Inc., hereinafter collectively referred to as 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 San Diego Unified Port District (SDUPD) 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.

- 4. CITY OF SAN DIEGO.** The City of San Diego owns and operates a municipal separate storm sewer system (MS4) through which it discharges ~~pollutants~~waste commonly found in urban runoff to San Diego Bay subject to the terms and conditions of a NPDES Storm Water Permit. The City of San Diego has ~~caused or permitted the discharge of~~discharged urban storm water ~~pollutants~~containing waste directly to San Diego Bay at the Shipyard Sediment Site, in violation of waste discharge requirements. 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 City of San Diego has also ~~caused or permitted the discharge of these~~discharged urban storm water ~~pollutants~~containing waste in violation of waste discharge requirements, 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, in violation of waste discharge requirements prescribed by the Regional Board. Studies indicate that during storm events, storm water plumes toxic to marine life ~~and containing urban storm water pollutants~~, 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 ~~pollutants in~~containing waste that has discharged from the on-site and off-site MS4

~~discharges have~~has contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, ~~which~~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 Cleanup and Abatement Order.

- 5. MARINE CONSTRUCTION AND DESIGN COMPANY AND CAMPBELL INDUSTRIES, INC.** Marine Construction and Design Company and Campbell Industries, Inc. (hereinafter collectively referred to as “SDMC”) has (1) ~~caused or permitted discharged~~ pollutants from its shipyard operations ~~to be discharged in~~to San Diego Bay in violation of waste discharge requirements; and (2) ~~caused or permitted waste to be~~ discharged or deposited ~~waste~~ where it was discharged into San Diego Bay ~~creating, or threatening and created, or threatens~~ 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). Based on these considerations, Marine Construction and Design Company and Campbell Industries, Inc. are referred to as “Discharger(s)” in this Cleanup and Abatement Order.

Between 1914 and 1979, San Diego Marine Construction Company and its successor San Diego Marine Construction Corporation, a wholly owned subsidiary of Campbell Industries, Inc., a wholly owned subsidiary of Marine Construction and Design Company (MARCO), collectively referred to as SDMC, 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 SDMC 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.

- 6. CHEVRON, A SUBSIDIARY OF CHEVRONTEXACO.** 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 Regional 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 Cleanup and Abatement Order.

- 7. 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 polynuclear aromatic hydrocarbons (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 Regional 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 Cleanup and Abatement Order.

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

SDG&E (1) has ~~caused or permitted pollutants discharged~~ waste from its power plant operations, including metals (copper, nickel, and zinc) ~~to be discharged into~~ San Diego Bay in violation of waste discharge requirements; and (2) ~~discharged waste or deposited~~ ~~caused or permitted~~ waste ~~where it would probably be discharged,~~ (including metals ([chromium, copper, lead, nickel, and zinc]), polychlorinated biphenyls ([PCBs]), polynuclear aromatic hydrocarbons ([PAHs]), and total petroleum hydrocarbons ([TPH-d and TPH-h])) ~~to be discharged or deposited where it was discharged~~ into San Diego Bay ~~creating and created,~~ or ~~threatening~~ ~~threatens~~ to create, a condition of pollution or nuisance. Based on these considerations SDG&E is referred to as “Discharger(s)” in this Cleanup and Abatement Order.

San Diego Gas and Electric, a subsidiary of Sempra Energy Company (hereinafter SDG&E) owned and operated the Silver Gate Power Plant along the north side of the ~~Southwest Marine~~-BAE Systems leasehold from approximately 1943 to the 1990s. SDG&E utilized an easement to San Diego Bay along ~~Southwest Marine's~~-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 Sites.

9.—UNITED STATES NAVY.

9. The U.S. Navy owns and operates a municipal separate storm sewer system (MS4) at NAVSTA San Diego through which it has caused or permitted the discharge of pollutants 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 U.S. Navy has caused or permitted marine sediment and associated pollutantswaste to be resuspended into the water column as a result of shear forces generated by the thrust of propellers during ship movements at NAVSTA San Diego. 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 cited above have contributed to the accumulation of pollutants in marine sediment at the Shipyard Sediment Site to levels, which 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 the preceding considerations, the U.S. Navy is referred to as “Discharger(s)” in this Cleanup and Abatement Order.

From the year 1921 to the present, the U.S. Navy has provided shore support and pier-side berthing services to U.S. Pacific fleet vessels at Naval Station San Diego (NAVSTA San Diego) located at 3445 Surface Navy Boulevard in the City of San Diego. NAVSTA San Diego 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 the years 1938 and 1956 the NAVSTA San Diego leasehold included a parcel of land, 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. At this location, the U.S. Navy 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, polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs), polynuclear aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons (TPH)) are associated with the characteristics of the waste the U.S. Navy operations generated at the 28th Street Shore Boat Landing Station site.

FACTUAL BACKGROUND

- 10. CLEAN WATER ACT SECTION 303(d) LIST.** Approximately 55 acres of 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. The Shipyard Sediment Site occupies this shoreline. The Regional Board has determined that issuance of a cleanup and abatement order (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.
- 11. SEDIMENT QUALITY INVESTIGATION.** NASSCO and BAE Systems (formerly Southwest Marine) 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). Unless otherwise explicitly stated, the Regional Board's finding and conclusions in this Cleanup and Abatement Order are based on the data and other technical information contained in the Shipyard Report prepared by NASSCO's and BAE Systems' consultant, Exponent.

AQUATIC LIFE BENEFICIAL USE IMPAIRMENT

- 12. 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 Cleanup and Abatement Order.
- 13. WEIGHT-OF-EVIDENCE APPROACH.** The Regional 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, bioaccumulation analyses, and interstitial water (i.e., pore water) analyses. The Regional Board evaluated pollutant exposure and adverse effects to fish using fish histopathology analyses and analyses of PAH breakdown products in fish bile.

- 14. SEDIMENT QUALITY TRIAD MEASURES.** The Regional 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.
- 15. REFERENCE SEDIMENT QUALITY CONDITIONS.** The Regional 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 Southwest Marine (now 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 |

- 16. SEDIMENT QUALITY TRIAD RESULTS.** The Regional Board categorized 14 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. These results are based on the synoptic measures of sediment chemistry, toxicity, and benthic community structure at the Shipyard Sediment Site. [In addition, an evaluation of 27 of the sampling stations utilizing the State Water Resources Control Board’s Draft Sediment Quality Objectives categorizes 20 of 27 stations as not protective of aquatic life.](#)
- 17. BIOACCUMULATION.** The Regional 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 in proportion to as chemical pollutant concentrations in sediment increase. Statistically significant relationships were found for arsenic, copper, lead, mercury, zinc, TBT, total 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.
- 18. PORE WATER.** The Regional Board evaluated the chemistry of pore water, the water occupying the spaces between sediment particles, at the Shipyard Sediment Site to determine compliance with California Toxics Rule (CTR) water quality criteria and the potential risks to the benthic community from chemical pollutants present in the sediment. Comparisons were made to the CTR saltwater quality criterion continuous concentration, which is the highest concentration of a pollutant to which marine aquatic life can be exposed for an extended period of time without deleterious effects. Of the 12 site stations sampled for pore water (SW02 was excluded due to the presence of some suspended material remaining after centrifugation), 12 stations exceeded the copper CTR value, 6 stations exceeded the lead CTR value, and 12 stations exceeded the total PCBs CTR value. Although the comparisons to the CTR criteria identified several pollutants for which measured pore water concentrations are above levels of concern, the measured pore water concentrations may be biased high due to the possible presence of very fine suspended or colloidal material in the pore water samples that could not be removed by centrifugation.
- 19. FISH HISTOPATHOLOGY.** The Regional Board evaluated fish histopathology data to determine the potential exposure and associated adverse effects on fish from chemical pollutants present within and adjacent to the Shipyard Sediment Site. A total of 253 spotted sand bass were examined for various histopathological lesions. These spotted sand bass were collected from four discrete assessment units at the Shipyard Sediment Site and at a reference area located across San Diego Bay near Reference Station 2240. The fish histopathology data indicates a total of 70 types of histopathological lesions were found in the spotted sand bass. Of the 70 types of lesions found, five lesions exhibited statistically significant elevations relative to reference conditions. The five lesions are abundant lipofuscin in liver,

abundant hemosiderin in liver, cholangitis/biliary hyperplasia (CBH) in liver, nephritis in kidney, and shiny gill foci. A sixth lesion (i.e., foci of cellular alteration in livers) was considered important even though no statistical differences were found because the existence of these lesions indicates a harmful effect strongly linked to PAH exposure. Of the six lesions identified as significantly elevated with respect to reference conditions, two, CBH and foci of cellular alteration, have been identified as being associated with contaminant exposure. Scientific literature describing lesions that are potential biomarkers of environmental stressors in fish does not attribute causation of lipofuscin, hemosiderin, nephritis, and shiny gill foci to pollution-related factors. It is plausible that the lesions could have been caused by naturally occurring environmental factors such as infectious parasites. Based on these considerations the fish histopathology data does not indicate that the fish lesions observed in the data set can be conclusively attributed to contaminant exposure at the Shipyard Sediment Site.

- 20. FISH BILE.** The Regional Board evaluated fish bile sampling results to determine the potential exposure of fish to polynuclear aromatic hydrocarbon (PAH) compounds within and adjacent to the Shipyard Sediment Site. The bile samples were analyzed for fluorescent aromatic compounds (FACs) and total proteins. Three groups of FACs were measured that correspond to metabolites (PAH breakdown products) from naphthalene, phenanthrene, and benzo[a]pyrene. Metabolites were detected in bile of spotted sand bass captured inside and outside of the Shipyard Sediment Site and within a reference area located across the bay from the shipyard sites near Reference Station 2240. Metabolites of two contaminants exhibited elevated levels relative to reference conditions in spotted sand bass collected immediately outside of the Shipyard Sediment Site when their mean concentrations were compared against reference data. No metabolites were significantly elevated relative to reference conditions in spotted sand bass collected inside of the Shipyard Sediment Sites.

The upper prediction limit (UPL) at the 95 percent confidence interval was also calculated for the metabolites of the reference area fish and compared to replicate fish bile samples from the four areas of the Shipyard Sediment Site (i.e., inside and outside of both NASSCO and BAE Systems leaseholds). The inside and outside areas of NASSCO had samples that exceeded the UPL. Inside NASSCO accounted for six of the 19 UPL exceedances. Two fish bile samples from inside NASSCO exceeded the UPL for naphthalene, phenanthrene, and benzo[a]pyrene metabolites. From Outside NASSCO, 12 of the 13 UPL exceedances came from phenanthrene and benzo[a]pyrene metabolite samples.

For BAE Systems, all exceedances came from outside BAE Systems of which nine of 11 exceedances were for the benzo [a] pyrene metabolite samples. The remaining two exceedances were for the phenanthrene metabolite samples. No exceedances were found from inside BAE Systems; however, the PAH sediment chemistry data from inside BAE Systems showed the highest levels of sediment contamination.

The inconsistent relationship between the levels of FACs in fish and PAH contaminated sediment indicates that this data is inconclusive and the FAC concentrations observed in the fish cannot be exclusively attributed to contaminant exposure at the Shipyard Sediment Site. The variable nature of the sediment contamination found in bays and the mobility of the fish are confounding factors when attempting to correlate fish sampling results with sediment contamination.

- 21. INDICATOR SEDIMENT CHEMICALS.** The Regional 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).

AQUATIC-DEPENDENT WILDLIFE BENEFICIAL USES IMPAIRMENT

- 22. 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 the Cleanup and Abatement Order.
- 23. RISK ASSESSMENT APPROACH FOR AQUATIC-DEPENDENT WILDLIFE.** The Regional 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 comprehensive risk assessment was based on tissue data derived from resident fish and shellfish caught within and adjacent to the Shipyard Sediment Site.

24. 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, and total PCBs.

25. TIER II BASELINE 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*). 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 a risk to all receptors of concern (excluding the sea lion). The chemical in prey tissue posing a risk include benzo[a]pyrene, total PCBs, copper, lead, mercury, and zinc.

HUMAN HEALTH BENEFICIAL USES IMPAIRMENT

26. HUMAN HEALTH IMPAIRMENT. Human health 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. Human health beneficial uses include: Contact Water Recreation (REC-1), Non-contact Water Recreation (REC-2), Shellfish Harvesting (SHELL), and Commercial and Sport Fishing (COMM). This finding is based on the

considerations described below in this *Impairment of Human Health Beneficial Uses* section of the Cleanup and Abatement Order.

27. RISK ASSESSMENT APPROACH FOR HUMAN HEALTH. The Regional 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 American Society of Testing Material (ASTM) protocols. The Tier II 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:

- a. 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.

28. 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 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.

29. TIER II BASELINE 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 to recreational and subsistence anglers. The chemicals posing cancer risks include inorganic arsenic and PCBs. The chemicals posing non-cancer risks include cadmium, copper, mercury, and total PCBs.

CLEANUP TO BACKGROUND SEDIMENT QUALITY CONDITIONS

30. BACKGROUND SEDIMENT QUALITY. The Regional 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 15. The background sediment chemistry levels based on these reference stations are as follows:

Background Sediment Chemistry Levels

| Chemical | Units (dry weight) | Background Sediment Chemistry Levels ⁽¹⁾ |
|------------------------------------|-----------------------|--|
| Metals | | |
| Arsenic | mg/kg | 7.5 |
| Cadmium | mg/kg | 0.33 |
| Chromium | mg/kg | 57 |
| Copper | mg/kg | 121 |
| Lead | mg/kg | 53 |
| Mercury | mg/kg | 0.57 |
| Nickel | mg/kg | 15 |
| Silver | mg/kg | 1.1 |
| Zinc | mg/kg | 192 |
| Organics | | |
| Dibutyltin | µg/kg | 21 |
| Monobutyltin | µg/kg | 14 |
| Tributyltin | µg/kg | 22 |
| Tetrabutyltin | µg/kg | (1.4) |
| HPAH ⁽²⁾ | µg/kg | 673 |
| PPPAH ⁽³⁾ | µg/kg | 1,234 |
| Benzo[a]pyrene | µg/kg | 202 |
| Total PCB Congeners ⁽⁴⁾ | µg/kg | 84 |
| Polychlorinated terphenyls | µg/kg | (142) |

(1) Based on the 95 percent upper prediction limit calculated from a pool of reference stations in San Diego Bay. Parentheses () indicates non-detects accounted for more than or equal to half the values.

(2) HPAH = High Molecular Weight Polynuclear Aromatic Hydrocarbons

(3) PPPAH = Priority Pollutant Polynuclear Aromatic Hydrocarbons

(4) PCB = Polychlorinated Biphenyls

Note: A regression analysis of the grain size:metals relationship is used in establishing background sediment chemistry levels. The background metals concentration is based on the 95% UPL using 50% fine grain sediment. These values are conservative concentrations because the mean fine grain sediment at the Shipyard Investigation Site is 70% fine grain sediment. See Appendix for Section 15 of the Draft Technical Report for Tentative Cleanup and Abatement Order No. R9-2005-0126 for further details on the regression analysis.

31. TECHNOLOGICAL ~~FEASABILITY~~FEASIBILITY CONSIDERATIONS. It is technologically feasible to cleanup to background sediment quality levels at the Shipyard Sediment Site. The Regional Board considered three remedial technologies for the cleanup to background evaluation: (1) Natural Recovery, (2) Subaqueous Capping, and (3) Dredging. Based on current site use, natural recovery is considered to be technologically infeasible due to sediment disturbance from normal shipyard activities (e.g., vessel propeller wash, ship traffic, dry dock movements, maintenance/navigational dredging, engine tests, construction, etc.). Subaqueous capping is also considered to be technologically infeasible based on current site use because of the ever-larger ships being serviced at the shipyards, the associated navigational requirements, and the likelihood of cap disturbance resulting from normal shipyard activities (e.g., vessel propeller wash). Dredging, although difficult to implement because the Shipyard Sediment Site is currently a working shipyard, is considered to be technologically feasible. Dredging is a proven technology and it has been used not only in San Diego Bay but also throughout the United States for remediation of contaminated sediment.

32. ECONOMIC ~~FEASABILITY~~FEASIBILITY CONSIDERATIONS. The Regional Board evaluated a number of criteria to determine tradeoffs in risks, costs, and benefits associated with cleanups to background sediment chemistry levels and six alternative cleanup levels greater than background. The criteria included factors such as total cost, volume of sediment dredged, short- and long-term effects on beneficial uses (aquatic life, aquatic-dependent wildlife, and human health), effects on shipyards and associated economic activities, effects on local businesses and neighborhood quality of life, and effects on recreational, commercial, or industrial uses of aquatic resources. Based on these considerations, the Regional Board concludes that it is not economically feasible to cleanup to the background sediment chemistry levels.

ALTERNATIVE SEDIMENT CLEANUP LEVELS

33. ALTERNATIVE CLEANUP LEVELS. The Regional Board has selected the alternative cleanup levels presented below for the Shipyard Sediment Site. In approving alternative cleanup levels less stringent than background the Regional Board has considered the factors contained in Resolution 92-49 and the California Code of Regulations, Title 23, section 2550.4, subdivision (d)¹.

- a. ***Alternative Cleanup Levels are Appropriate.*** The Regional Board has determined that it is economically infeasible to cleanup to background sediment quality levels at the Shipyard Sediment Site. The overall benefit of remediating the site to the alternative

¹Resolution 92-49 provides that in approving any alternative cleanup levels less stringent than ¹Resolution 92-49 provides that in approving any alternative cleanup levels less stringent than background sediment quality the Regional Board must consider the conditions described in California Code of Regulations, Title 23, section 2550.4. Resolution 92-49 further requires that any alternative cleanup levels shall (1) be consistent with maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial use 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.

cleanup levels is approximately equal to the overall benefit of cleaning up to background for considerably less cost.

- b. ***Alternative Cleanup Levels Are Consistent With Water Quality Control Plans And Policies.*** The alternative cleanup levels will not result in water quality less than prescribed in water quality control plans and policies adopted by the State Water Resources Control Board and the Regional Board². The alternative sediment quality levels are well below levels expected to cause toxicity to aquatic life and will substantially reduce existing risks to aquatic dependent wildlife and human health.
- c. ***Alternative Cleanup Levels Are Consistent With The Maximum Benefit To The People Of The State.*** The level of water quality that will be attained upon implementation of the alternative cleanup levels at the Shipyard Sediment Site is consistent with the maximum benefit to the people of the state. The San Diego Bay shoreline between Sampson and 28th Streets is listed on the Clean Water Act 303(d) list for elevated levels of copper, mercury, PAHs, and PCBPCBs at the Shipyard Sediment Site. While it is impossible to determine the precise level of water quality that will be attained given the residual sediment pollutants constituents that will remain at the site, compliance with the alternative cleanup levels will markedly improve water quality conditions in the Shipyard Sediment Site and result in attainment of water quality standards at the site.

² Applicable numerical and narrative water quality objectives for San Diego Bay Waters include the Regional Board's Toxicity Objective, [the California, the](#) California Toxics Rule Water Quality Criteria, and the State Water Board Policy for Implementation of Toxics Standards (the SIP) which provides that mixing zones shall not result in "objectionable bottom deposits." This term is defined as "an accumulation of materials... on or near the bottom of a water body which creates conditions that adversely impact aquatic life, human health, beneficial uses, or aesthetics. These conditions include, but are not limited to, the accumulation of pollutants in the sediments ([SIP at Appendix 4^{SWRCB, 2005}](#)).

Alternative Sediment Cleanup Levels

| Chemical | Units (dry weight) | Alternative Sediment Cleanup Levels ⁽¹⁾ |
|------------------------------------|-------------------------------|---|
| <i>Metals</i> | | |
| Arsenic | mg/kg | 10 |
| Cadmium | mg/kg | 1.0 |
| Chromium | mg/kg | 81 |
| Copper | mg/kg | 200 |
| Lead | mg/kg | 90 |
| Mercury | mg/kg | 0.7 |
| Nickel | mg/kg | 20 |
| Silver | mg/kg | 1.5 |
| Zinc | mg/kg | 300 |
| <i>Organics</i> | | |
| Tributyltin | µg/kg | 110 |
| Benzo[a]pyrene | µg/kg | 1,010 |
| Total PCB Congeners ⁽²⁾ | µg/kg | 420 |

1(1) Cleanup levels for tributyltin, benzo[a]pyrene, and total PCB congeners are based on 5 times background, constituents which, at 5 times background, determine the largest cleanup footprint. The other chemical concentrations are based on an evaluation of that cleanup footprint.

2(2) PCB = polychlorinated biphenyl

34. 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 Regional 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.

- 35. CEQA EXEMPTION.** This enforcement action is exempt from the provisions of the California Environmental Quality Act (CEQA) ~~in accordance with~~ because it falls 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 15321 (Enforcement Actions by Regulatory Agencies), Chapter 3, Title 14 of the California Code of Regulations 21084 of CEQA. [14 CCR 15307, 15308, and 15321.] The Regional Board will not undertake any construction activity as a result of this Order, nor will the issuance of this Order allow environmental degradation.
- 36. PUBLIC NOTICE.** The Regional Board has notified all known interested persons and the public of its intent to adopt this Cleanup and Abatement Order and has provided them with an opportunity to submit written comments and recommendations.
- 37. PUBLIC HEARING.** The Regional Board has considered all comments pertaining to this Cleanup and Abatement Order submitted to the Regional Board in writing, or by oral presentations at the public hearing held on [date(s) to be inserted]. Detailed responses to relevant comments have been incorporated into the final Technical Report for the Cleanup and Abatement Order adopted by this Order.
- 38. TECHNICAL REPORT.** The attached “Draft Technical Report for Tentative Cleanup and Abatement Order No. R9-2005-0126” is hereby incorporated as a finding in support of this Cleanup and Abatement Order as if fully set forth here verbatim.

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. (formerly Southwest Marine, Inc.); City of San Diego; Marine Construction and Design Company and Campbell Industries, Inc; San Diego Gas and Electric, a subsidiary of Sempra Energy Company; and the United States Navy (hereinafter Discharger(s)), shall comply with the following directives:*

A. CLEANUP AND ABATE

1. Terminate Illicit Discharges. The Discharger(s) shall terminate all illicit discharges to San Diego Bay in violation of waste discharge requirements or other order or prohibition issued by the Regional Board.

2. **Corrective Actions.** The Discharger(s) shall take all corrective actions³ necessary to cleanup contaminated marine bay sediment at the Shipyard Sediment Site to attain the sediment quality levels specified below:

| Chemical | Units (dry weight) | Sediment Quality Levels |
|------------------------------------|-------------------------------|--------------------------------|
| <i>Metals</i> | | |
| Arsenic | mg/kg | 10 |
| Cadmium | mg/kg | 1.0 |
| Chromium | mg/kg | 81 |
| Copper | mg/kg | 200 |
| Lead | mg/kg | 90 |
| Mercury | mg/kg | 0.7 |
| Nickel | mg/kg | 20 |
| Silver | mg/kg | 1.5 |
| Zinc | mg/kg | 300 |
| <i>Organics</i> | | |
| Tributyltin | µg/kg | 110 |
| Benzo[a]pyrene | µg/kg | 1,010 |
| Total PCB Congeners ⁽¹⁾ | µg/kg | 420 |

(1) PCB = polychlorinated biphenyl

3. **Site Investigation.** San Diego Gas and Electric, a subsidiary of Sempra Energy Company, (SDG&E) shall prepare and submit a Site Investigation Report (Report) by [date based on 45 days after adoption to be inserted] containing the following information:
- Site Conceptual Model.* The Report shall contain a site conceptual model showing all the current and former potential pathways for pollutants to potentially discharge from the SDG&E property to the Shipyard Sediment Site, including all elements of the Storm Water Conveyance System (SWCS) between the SDG&E property and San Diego Bay.
 - Source Characterization.* The Report shall describe the results of an investigation of all potential sources of waste discharges to surface soils and storm water conveyance systems based on historical records of operation, site reconnaissance, and previous sampling studies. Potential sources that should be investigated include current or

³ Corrective Actions include the phases of cleanup and abatement described in Directives A through D of this Cleanup and Abatement order.

- former locations of tanks, drains, sumps, areas of stained soil, container storage areas, transformers, and other areas where waste constituents were handled, stored, or used. All current or former locations of sources of waste constituents shall be located on a site map at a scale of 1 inch = 200 feet or larger, with graphics indicating surface water drainage directions on and adjacent to the SDG&E property.
- c. *Storm Water Conveyance System (SWCS) Characterization.* The Report shall characterize the presence of waste constituents in loose and cemented sediment found in the SWCS, including catch basins tributary to the SWCS on and adjacent to the SDG&E property, and between the SDG&E property and San Diego Bay.
 - d. *Extent of Waste Constituent Characterization.* The Report shall characterize the lateral and vertical extent of each waste constituent above the background⁴ value for that waste constituent.
 - e. *Chemical Analyses.* The report shall describe the laboratory analytical methods and protocols used for each sample analysis. The suite of chemical analyses must be adequate to identify the full range of site-specific waste constituents including, at a minimum, polychlorinated biphenyls, copper, lead, zinc, total petroleum hydrocarbons (TPH), and benzo(a)pyrene.⁵
 - f. *Sample Locations and Number.* The locations, type, and number of samples shall be identified and shown on a site map and cross sections. The number of samples and suite of chemical analyses must be sufficient to identify the nature of waste constituent sources, to define the distribution of waste constituents on the ground surface and in the SWCS on the SDG&E property and between the SDG&E property and San Diego Bay.

B. REMEDIAL ACTION PLAN AND IMPLEMENTATION

1. ***Remedial Action Plan (RAP).*** The Discharger(s) shall submit a Remedial Action Plan (RAP) to the Regional Board by [date based on 90 days after adoption to be inserted]. The RAP shall contain the following information:
 - a. *Implementation Activities.* A detailed description of all activities planned to implement the corrective actions necessary to comply with all the directives herein;
 - b. *Shipyard Sediment Site Map.* A map(s), using an appropriate modeling program, illustrating the horizontal and vertical distribution of pollutants within the remediation area defined by the sediment quality cleanup levels described in Directive A.1;

⁴ “Background” is defined as the concentration or measures of constituents or indicator parameters in soil that have not been affected by waste constituents released from the SDG&E property.

⁵ These waste constituents, except for benzo(a)pyrene, were reported in elevated concentrations in surface soil samples from the SDG&E property [see Section 8.9 of the Draft Technical Report]. Benzo(a)pyrene is a component of the TPH reported in elevated concentrations in the surface soil samples from the SDG&E property.

D. POST CLEANUP MONITORING

1. ***Post Cleanup Monitoring Plan.*** The Discharger(s) shall submit a Post Cleanup Monitoring Plan to the Regional Board by [Insert Date]. The Post Cleanup Monitoring Plan shall be designed to confirm the short-term and long-term effectiveness of the cleanup. The Post Cleanup Monitoring Plan shall contain the following information:
 - a. ***Monitoring Activities.*** A detailed description of monitoring and sampling activities designed to assess the site conditions, including the benthic community health, after the RAP is completed. The monitoring activities shall include sampling for a period of not less than five years; and
 - b. ***Schedule.*** A schedule detailing the sequence of events and time frame for each activity. The schedule shall also include the dates for submittal of the Post-Cleanup Monitoring annual progress reports and final report as detailed in Section D.2. below.

2. ***Post Cleanup Monitoring Report.*** The Discharger shall submit annual progress reports and a final Post Cleanup Monitoring Report, on a schedule to be established by the Regional Board in a subsequent amendment to this Cleanup and Abatement Order, containing the following information:
 - a. ***Monitoring Activities.*** A detailed description of the post cleanup monitoring activities performed; and
 - b. ***Interpretations and Conclusions.*** Interpretations and conclusions regarding the potential presence and chemical characteristics of any newly deposited sediment within the cleanup areas, and interpretations and conclusions regarding the health and recovery of the benthic communities.

E. REGIONAL BOARD CONCURRENCE

1. ***Regional Board Concurrence.*** Upon concurrence with the findings of the Cleanup and Abatement Completion Report (Directive C.1) and the Post Cleanup Monitoring Report (Directive D.2) that remedial actions and monitoring are complete and that compliance with this Cleanup and Abatement Order is achieved, the Regional Board will inform the Discharger(s) and other interested persons in writing that no further remedial work is required at this time, based on available information. This written notice shall constitute Regional Board concurrence with the completed remedial actions.

F. PROVISIONS

1. **Cost Recovery.** The Discharger(s) shall reimburse the State of California for all reasonable costs actually incurred by the Regional Board to investigate, oversee, and monitor cleanup and abatement actions required by this Cleanup and Abatement Order, according to billing statements prepared from time to time by the State Water Resources Control Board. If the Discharger(s) is enrolled in a reimbursement program managed by the State Water Resources Control Board for the discharge addressed by this Cleanup and Abatement Order, reimbursement shall be made pursuant to the procedures established in that program.
2. **Waste Management.** The Discharger(s) shall properly manage, store, treat, and dispose of contaminated soils and ground water 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 Discharger(s) shall, as required by the Regional 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.
3. **Request to Provide Information.** The Discharger(s) 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 Discharger(s) and the Regional Board and may result in overall reduction of the time necessary for regulatory approval.
4. **Waste Constituent Analysis.** Unless otherwise permitted by the Regional 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 Discharger(s) proposes 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 Regional 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 Regional Board.
5. **Duty to Operate and Maintain.** The Discharger(s) 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 Discharger(s) to achieve compliance with this Cleanup and Abatement Order. 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 Discharger(s) only when the operation is necessary to achieve compliance the conditions of this Cleanup and Abatement Order.

6. ***Duty to Use Registered Professionals.*** The Discharger(s) shall provide documentation that plans and reports required under this Cleanup and Abatement Order 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 Discharger(s). The lead professional shall sign and affix their registration stamp to the report, plan or document.
7. ***Corporate Signatory Requirements.*** All reports required under this Order shall be signed and certified by a responsible corporate officer(s) of the Discharger(s) 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 Regional 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 Regional 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.”

8. *Duty to Submit Other Information.* When the Discharger(s) becomes aware that it failed to submit any relevant facts in any report required under this Cleanup and Abatement Order, or submitted incorrect information in any such report, the Discharger(s) shall promptly submit such facts or information to the Regional Board.
9. *Electronic and Paper Media Reporting Requirements.* The Discharger(s) shall submit both electronic and paper copies of all reports required under this Cleanup and Abatement Order including work plans, technical reports, and monitoring reports.
10. *Report Submittals.* All monitoring and technical reports required under this Cleanup and Abatement Order 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

11. *Identify Documents Using Code Number.* In order to assist the Regional Board in the processing of correspondence and reports submitted in compliance with this Cleanup and Abatement Order, the Discharger(s) shall include the following code number in the header or subject line portion of all correspondence or reports submitted to the Regional Board:

For all correspondences: **Shipyards CAO: 03-0284.05**
For all reports: **Shipyards CAO: 03-0284.051**

12. **Amendment.** This Cleanup and Abatement Order in no way limits the authority of this Regional Board to institute additional enforcement actions or to require additional investigation and cleanup consistent with the California Water Code. This Cleanup and Abatement Order may be revised by the Regional 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 Cleanup and Abatement Order, 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 Regional 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 Cleanup and Abatement Order will be accordingly amended.

G. NOTIFICATIONS

1. **Enforcement Discretion.** The Regional Board reserves its right to take any enforcement action authorized by law for violations of the terms and conditions of this Cleanup and Abatement Order.
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 cleanup and abatement order, the Regional 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 Regional Board for violating a cleanup and abatement order 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 Regional Board for violating a cleanup and abatement order 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, John H. Robertus, Executive Officer, do hereby certify the forgoing is a full, true, and correct copy of a Cleanup and Abatement Order issued on [Insert Date].

John H. Robertus
Executive Officer

Attachment 1. Map of Shipyard Sediment Site (Exponent, 2003)

