

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

**INVESTIGATIVE ORDER NO. R9-2017-0083
AN ORDER DIRECTING**

**BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.
AND SAN DIEGO GAS AND ELECTRIC COMPANY TO SUBMIT TECHNICAL REPORTS
PERTAINING TO AN INVESTIGATION OF SEDIMENT CHEMISTRY IN SAN DIEGO BAY TO
THE NORTH
OF BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.**

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

1. **Legal and Regulatory Authority.** This Order conforms to and implements policies and requirements of the Porter-Cologne Water Quality Control Act (division 7 of the Water Code, commencing with section 13000) including (1) sections 13267 and 13304; (2) applicable State and federal regulations; (3) all applicable provisions of statewide Water Quality Control Plans adopted by the State Water Resources Control Board (State Water 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 and regulations, including Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*, Resolution No. 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*, the *Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality* (Bays and Estuaries Plan),¹ and California Code of Regulations title 23,² chapter 16, article 11, and title 23, section 3890 et seq.; and (5) relevant standards, criteria, and advisories adopted by other State and federal agencies.

2. **Geographic Extent of the Investigation.** The San Diego Water Board needs additional sediment data for the area of San Diego Bay (Bay) north of the BAE Systems San Diego Ship Repair, Inc. (BAE Systems) leasehold. The data are needed to delineate the extent and magnitude of pollutants discharged by San Diego Gas and Electric Company (SDGE) and BAE Systems to determine if additional cleanup and abatement activities are required to restore the beneficial uses of San Diego Bay.

¹ http://www.waterboards.ca.gov/water_issues/programs/bptcp/docs/sediment/sed_qlty_part1.pdf

² In this Order, the term “title 23” refers to the California Code of Regulations from this point forward.

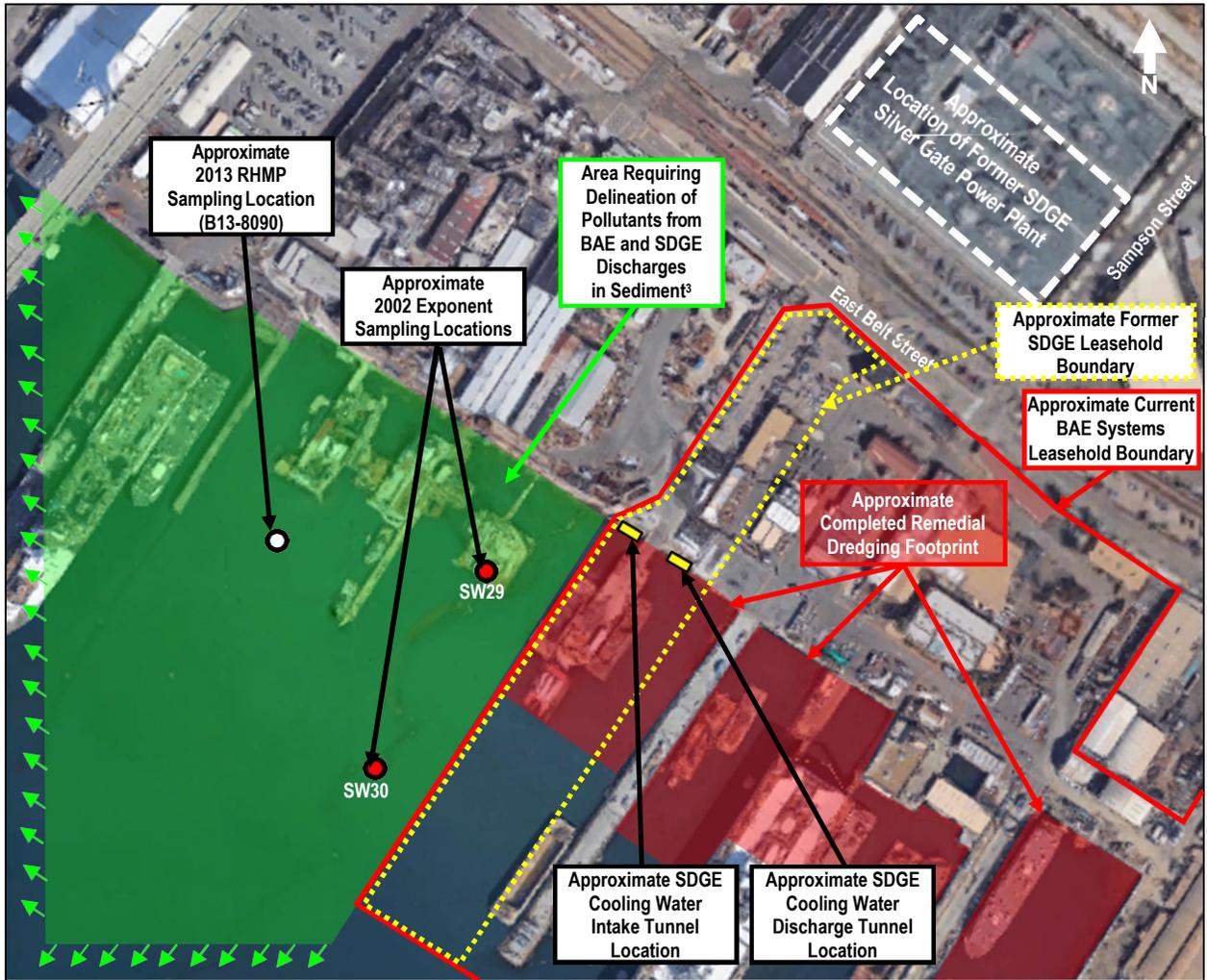


Figure 1. Approximate Area Requiring Delineation³

3. **BAE Systems San Diego Ship Repair, Inc.** The BAE Systems facility is located on approximately 40 acres of tidelands leased from the San Diego Unified Port District (Port District) on the San Diego Bay front (see red outlined area in Figure 1). The BAE Systems leasehold area is comprised of approximately 16 acres of land at 2205 East Belt Street, at the foot of Sampson Street in San Diego, and an adjacent offshore area of approximately 24 acres of water. Improvements on the water included several piers and two floating dry docks. The second floating dry dock was recently constructed on the northwestern end of the facility near the leasehold property line, within an area formerly leased to San Diego Gas and Electric Company (SDGE) by the Port District (see yellow dashed outlined area in Figure 1).

³ The scope of the investigation is to fully delineate the extent and magnitude of pollutants in Bay sediments that are potentially attributed to discharges from BAE Systems and SDGE to the north of the BAE Systems leasehold area. The green shaded area does not establish the boundaries of the area to be investigated under this order. Rather, it shows the broad area to the north and west of the BAE Systems leasehold within which the sediments potentially contaminated by discharges from BAE Systems and SDGE need to be investigated. Sediment sampling may not be needed throughout this entire area to define the extent of sediment potentially contaminated by discharges from BAE Systems and SDGE. Proposed sampling locations may be coordinated with the sediment chemistry investigation that will be conducted in the Continental Maritime of San Diego leasehold.

Industrial process and storm water discharges from the BAE Systems facility are currently regulated under *Waste Discharge Requirements for BAE Systems San Diego Ship Repair Inc. Discharge to San Diego Bay*, Order No. R9-2015-0034, NPDES No. CA0109151. Discharges from BAE Systems were previously regulated under San Diego Water Board Order Nos. 79-74, 83-11, 97-36, R9-2002-0161, and R9-2009-0080, and State Water Resources Control Board (State Water Board) Order Nos. 91-13-DWQ and 97-03-DWQ.

BAE Systems, formerly Southwest Marine, Inc. is a full-service ship repair facility that began occupying the leasehold in 1979. BAE Systems' primary business has historically been ship repair and maintenance for the U.S. Navy and commercial customers.

Ship modification, repair, and maintenance activities at the BAE Systems facility have historically encompassed a large variety of activities including, but not limited to, application of paint systems; installation and repair of a large variety of mechanical, electrical, and hydraulic systems and equipment; repair of damaged vessels; removal and replacement of expended/failed paint systems; and provision of entire utility/support systems to ships (and crews) during repair. As a result of these processes, an assortment of wastes has been generated including paint chips, abrasive grit, solvents, materials of petroleum origin, and heat. Some industrial processes at the facility are exposed or potentially exposed to storm water.

The perimeter of the onshore facilities, including piers, was bermed in approximately 2002 to prevent the discharge of contact storm water. The dry dock is contained to prevent storm water and wash water from entering San Diego Bay. Storm water collection is achieved by piping storm water catch basins/drains together, in varying groups, and pumping storm water to above ground holding tanks. There are eight primary holding tank areas, which vary in capacity and configuration depending on the surface area and flow. Total on-site holding capacity is 740,000 gallons. Storm water from the holding tanks is discharged to the City of San Diego's sanitary sewer or San Diego Bay if the holding tank capacity is exceeded.

On March 14, 2012, the San Diego Water Board adopted Cleanup and Abatement Order No. R9-2012-0024 *Shipyards Sediment Site, San Diego Bay, San Diego, CA* (Shipyards CAO) to remediate the impacted Bay sediments within the National Steel and Shipbuilding Company (NASSCO) and BAE Systems leaseholds, as well as the leasehold formerly occupied by SDGE, now part of the BAE Systems leasehold. The Shipyards CAO identified BAE Systems as one of several dischargers responsible for implementing corrective actions necessary to remediate the contaminated Bay sediments impacted by its waste discharges.

According to the Technical Report for the Shipyards CAO, BAE Systems was found to have caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay. This finding was based on historical San Diego Water Board inspection reports and sampling results, and the findings from an investigation provided in the *NASSCO and Southwest Marine Detailed Sediment Investigation, September 2003* report (Shipyards

Report), dated October 10, 2003, prepared by NASSCO's and BAE System's consultant, Exponent.

Discharges of waste to San Diego Bay were found to be the result of systemic problems and overall inadequacies in the implementation of best management practices (BMPs) by BAE Systems to prevent the discharge of pollutants to the Bay. BAE Systems was found to have discharged wastes that contained metals, butyltin species, polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs), polycyclic aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons (TPH). According to the Shipyard Report, the highest concentrations of most chemicals in sediment were found at the northern boundary of the site.

The Shipyard CAO required dredging and removing contaminated Bay sediments to remediate the sediments for the primary contaminants of concern (COCs), which include copper, mercury, high molecular weight polycyclic aromatic hydrocarbons (HPAHs), PCBs, and tributyltin (TBT). Implementation of the remedial dredging within the BAE leasehold required by the Shipyard CAO was completed in December 2015.

The northernmost end of the remedial dredging footprint required by the Shipyard CAO (see red shaded area in Figure 1) was limited to within the former SDGE (current BAE Systems) leasehold's northwestern boundary, even though the sediment data upon which the Shipyard CAO was based showed that sediments impacted by waste discharges from BAE Systems and other dischargers extended beyond the former SDGE (current BAE Systems) leasehold boundary to the north. Thus, the extent and magnitude of pollutants in sediment north of the remedial dredging footprint were not fully delineated at the time the Shipyard CAO was issued.

- 4. San Diego Gas and Electric Company.** From approximately 1943 to 1984, SDGE owned and operated the Silver Gate Power Plant located at 1348 Sampson Street, north of the BAE Systems facility on the northeastern side of Belt Street (see white dashed outlined area in Figure 1). SDGE utilized tidelands leased from the Port District (see yellow dashed outlined area in Figure 1) for the discharge and intake of cooling water to and from San Diego Bay via subsurface concrete tunnels (see Figure 1 for Bay intake and discharge locations) at flow rates averaging approximately 165 million gallons per day (MGD), up to a maximum of approximately 220 MGD. Cooling water discharges from the Silver Gate Power Plant were regulated under San Diego Water Board Resolution No. 69-R32 and Order Nos. 74-90, 76-9, and 85-07 until the plant was closed in 1995. The plant was fully decommissioned and demolished in 2006. Industrial storm water discharges were also regulated under State Water Board Order No. 91-13-DWQ.

The Shipyard CAO adopted by the San Diego Water Board on March 14, 2012 also identified SDGE as one of several dischargers responsible for implementing corrective actions necessary to remediate the contaminated Bay sediments impacted by its waste discharges. According to the Technical Report for the Shipyard CAO, the Silver Gate Power Plant owned and operated by SDGE was

found to have caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay.

This finding was based on historical documentation of Silver Gate Power Plant operations, soil samples from the closure of underground storage tanks (USTs) located on the plant, a City of San Diego investigation of sediments in catch basins that are part of the City's municipal separate storm sewer system (MS4), and soil samples from an investigation of the former wastewater ponds owned and operated by SDGE on the tidelands leased from the Port District. Results from UST soil, MS4 catch basin sediment, and former wastewater pond soil samples found detectable concentrations of metals, PCBs, PAHs, and TPH. The PCB analytical results included Aroclor mixtures. Aroclor-1254 and Aroclor-1260 PCB mixtures were present in the UST soil, MS4 catch basin sediment, and former wastewater pond soil samples.

Discharges of waste to San Diego Bay may have resulted from oils and other wastes from transformers and other equipment at the Silver Gate Power Plant that leaked or were improperly managed and disposed into floor drains that were connected to the cooling water discharge tunnel; oils and other wastes that were discharged to the Bay from wastewater ponds; and, wastes transported in storm water runoff to the City of San Diego's MS4 which ultimately discharged to the Bay. These wastes contained metals, PCBs, PAHs, and TPH. Discharges into the cooling water discharge tunnel and from the wastewater ponds would discharge wastes to the northern boundary of the BAE Systems site, which was found to have the highest concentrations of most chemicals in sediment according to the Shipyard Report.

The Shipyard CAO required dredging and removing contaminated Bay sediments to remediate the sediments for the primary COCs, which include copper, mercury, HPAHs, PCBs, and TBT. Implementation of the remedial dredging within the former SDGE leasehold, currently part of the BAE Systems leasehold, required by the Shipyard CAO was completed in December 2015.

The northernmost end of the remedial dredging footprint required by the Shipyard CAO (see red shaded area in Figure 1) was limited to within the former SDGE (current BAE Systems) leasehold's northwestern boundary, even though the sediment data upon which the Shipyard CAO was based showed that sediments impacted by waste discharges from SDGE extended beyond the former SDGE (current BAE Systems) leasehold boundary to the north. Thus, the extent and magnitude of pollutants in sediment north of the remedial dredging footprint were not fully delineated at the time the Shipyard CAO was issued.

- 5. Presence of Wastes in the Area Requiring Investigation.** Sediment chemistry data collected since 2000 confirms pollutants attributable to discharges from BAE Systems and SDGE are present in the Bay sediments to the north of the BAE System leasehold. The available sediment monitoring data collected since 2000 to the north of the BAE Systems leasehold are summarized below:

- a. In June 2001, pursuant to the authority provided under Water Code section 13267, the San Diego Water Board directed NASSCO and BAE Systems to

conduct a site-specific study to develop cleanup levels and identify sediment cleanup alternatives. As part of the sediment sampling conducted by NASSCO and BAE Systems for the study, and documented in the Shipyard Report prepared by their consultant Exponent, surface sediment and sediment core samples were collected in September 2002 from two locations to the north of the BAE Systems leasehold (see red dots in Figure 1).

The sediment samples collected at sampling locations SW29 and SW30 had detectable concentrations of heavy metals, butyltin species, PAHs, PCBs, and PCTs. The PCB analytical results included Aroclor mixtures. Aroclor-1254 and Aroclor-1260 were detected in the sediment samples from SW29 and SW30.

Tables 1a and 1b summarize the concentrations reported for Exponent sampling locations SW29 and SW30, respectively.

Table 1a. Sediment Chemistry Concentrations at SW29 Reported by Exponent

Waste Constituent	Units	ERL	ERM	Sample Depth Interval				
				Surface ^a	0-2 ft	2-4 ft	4-6 ft	6-7 ft
Arsenic	mg/kg	8.2	70	8.3 ¹	5.5	2.5	1.8	1.6
Cadmium	mg/kg	1.2	9.6	0.49	0.64	<0.95	0.17	0.11
Chromium	mg/kg	81	370	44 J	29	5.4	4.8	4.8
Copper	mg/kg	34	270	220 ¹	120 ¹	2.5	3.7	1.5
Lead	mg/kg	46.7	218	72 ¹	42	2.4	3.7	1.5
Mercury	mg/kg	0.15	0.71	0.93 J ²	0.64 ¹	0.06	0.08	0.03
Nickel	mg/kg	20.0	51.6	37 ¹	13	1.8	3.2	3.3
Selenium	mg/kg	NA	NA	<1.1	<1.1	<1.1	0.90	<0.80
Silver	mg/kg	1	3.7	1.2 ¹	0.76	0.03	0.06	0.11
Zinc	mg/kg	150	410	230 J ¹	170 ¹	14	13	12
TBT ^b	µg/kg	NA	NA	190	180	<1.3	<1.3	NA
Total PAHs ^c	µg/kg	4,022	44,792	4,900 J ¹	10,000 ¹	120	650	130
Total PCB ^d								
-Aroclors	µg/kg	22.7	180	3,100 ²	2,100 J ²	<27	<26	<24
-Congeners	µg/kg	22.7	180	820 ²	880 ²	2.3	<1.1	<1.1
-Homologs	µg/kg	22.7	180	1,200 ²	1,200 ²	5.4	<0.13	<0.13
Total PCTs ^e	µg/kg	NA	NA	4,800 J	4,600 J	<140	<130	<120

Notes:

- a: Surface samples collected from top 2 centimeters of sediment surface.
- b: Concentrations of monobutyltin, dibutyltin, tributyltin, and tetrabutyltin reported. Only tributyltin included in Table 1a.
- c: Concentrations of total PAHs were reported as individual PAHs, total low molecular weight PAHs (LPAHs), total high molecular weight PAHs (HPAHs), and total PAHs. Only total PAHs included in Table 1a.
- d: Concentrations of total PCBs reported as individual and total PCB Aroclors, individual and total PCB congeners, and individual and total PCB homologs. Only total PCB Aroclors, total PCB congeners, and total PCB homologs included in Table 1a.
- e: Concentrations of total PCTs reported as individual and total PCT Aroclors. Only total PCT Aroclors included in Table 1a.

ERL: Effects Range – Low concentration

ERM: Effects Range – Median concentration

TBT: tributyltin

PCB: polychlorinated biphenyl

PAH: polycyclic aromatic hydrocarbon PCT: polychlorinated terphenyl

NA: not available

J: estimated value

mg/kg: milligrams per kilogram

µg/kg: micrograms per kilogram

<: not detected above quantitation limit shown; quantitation limits for total PCB Aroclors, PCB congeners, PCB homologs, or PCTs are the sum of the quantitation limits for individual PCB Aroclors, PCB congeners, PCB homologs, or PCT Aroclors

1: Indicates maximum reported concentration exceeds the ERL

2: Indicates maximum reported concentration exceeds the ERM

Table 1b. Sediment Chemistry Concentrations at SW30 Reported by Exponent

Waste Constituent	Units	ERL	ERM	Sample Depth Interval					
				Surface ^a	0-2 ft	2-4 ft	4-6 ft	6-8 ft	8-8.7 ft
Arsenic	mg/kg	8.2	70	8.9 ¹	9.0 ¹	5.1	6.3	5.8	5.7
Cadmium	mg/kg	1.2	9.6	0.23	1.1	2.4 ¹	0.55	0.06	0.06
Chromium	mg/kg	81	370	72	42	22	25	10	7.2
Copper	mg/kg	34	270	240 ¹	210 ¹	32	29	5.3	3.8
Lead	mg/kg	46.7	218	72 ¹	71 ¹	17	34	4.7	1.8
Mercury	mg/kg	0.15	0.71	1.1 J ²	1.1 ²	0.31 ¹	0.95 ²	0.05	<0.02
Nickel	mg/kg	20.9	51.6	13	12	9.0	11	4.5	5.3
Selenium	mg/kg	NA	NA	<1.0	<1.4	<1.9	1.3	<0.90	<0.80
Silver	mg/kg	1	3.7	1.2 ¹	1.3 ¹	0.65	0.49	0.06	0.02
Zinc	mg/kg	150	410	300 ¹	280 ¹	91	100	22	12
TBT ^b	µg/kg	NA	NA	200	140	6.1	<1.9	<1.4	<1.3
Total PAHs ^c	µg/kg	4,022	44,792	5,200 ¹	5,400 ¹	1,200	3,200	510	90
Total PCB ^d									
-Aroclors	µg/kg	22.7	180	620 ²	980 ²	190 ²	<37	<28	<26
-Congeners	µg/kg	22.7	180	380 ²	560 ²	63 ¹	1.4	<1.1	0.03
-Homologs	µg/kg	22.7	180	540 ²	800 ²	93 ¹	2.8	<0.13	0.14
Total PCTs	µg/kg	NA	NA	770	1,100	<290 J	<290 J	<140 J	<130 J

Notes:

a: Surface samples collected from top 2 centimeters of sediment surface.

b: Concentrations of monobutyltin, dibutyltin, tributyltin, and tetrabutyltin reported. Only tributyltin included in Table 1b.

c: Concentrations of total PAHs were reported as individual PAHs, total low molecular weight PAHs (LPAHs), total high molecular weight PAHs (HPAHs), and total PAHs. Only total PAHs included in Table 1b.

d: Concentrations of total PCBs reported as individual and total PCB Aroclors, individual and total PCB congeners, and individual and total PCB homologs. Only total PCB Aroclors, total PCB congeners, and total PCB homologs included in Table 1b.

e: Concentrations of total PCTs reported as individual and total PCT Aroclors. Only total PCT Aroclors included in Table 1b.

ERL: Effects Range – Low concentration

ERM: Effects Range – Median concentration

TBT: tributyltin

PCB: polychlorinated biphenyl

PAH: polycyclic aromatic hydrocarbon

PCT: polychlorinated terphenyl

NA: not available

J: estimated value

mg/kg: milligrams per kilogram

µg/kg: micrograms per kilogram

<: not detected above quantitation limit shown; quantitation limits for total PCB Aroclors, PCB congeners, PCB homologs, or PCTs are the sum of the quantitation limits for individual PCB Aroclors, PCB congeners, PCB homologs, or PCT Aroclors.

- 1: Indicates maximum reported concentration exceeds the ERL
 2: Indicates maximum reported concentration exceeds the ERM

- b. The Port District, the City of San Diego, the City of Oceanside, and the County of Orange monitor harbors and bays in the San Diego Region every five years under the Regional Harbor Monitoring Program (RHMP). One surface sediment sample was collected in 2013 north of the BAE Systems leasehold (see white dot in Figure 1).

Table 2 summarizes the concentrations reported for the RHMP sampling location.

Table 2. Sediment Chemistry Concentrations Reported by RHMP

Waste Constituent	Units	ERL	ERM	2013 RHMP Sample B13-8090
Arsenic	mg/kg	8.2	70	15.2 ¹
Cadmium	mg/kg	1.2	9.6	0.50
Chromium	mg/kg	81	370	93.6 ¹
Copper	mg/kg	34	270	268 ¹
Lead	mg/kg	46.7	218	78.1 ¹
Mercury	mg/kg	0.15	0.71	0.96 ²
Nickel	mg/kg	20.9	51.6	26.8 ¹
Silver	mg/kg	1	3.7	1.59 ¹
Zinc	mg/kg	150	410	350 ¹
Total PAHs	µg/kg	4,022	44,792	3155
Total PCBs	µg/kg	22.7	180	685 ²

Notes:

RHMP: Regional Harbor Monitoring Program

ERL: Effects Range – Low concentration

ERM: Effects Range – Median concentration

PAHs: polycyclic aromatic hydrocarbons

PCBs: polychlorinated biphenyls

mg/kg: milligrams per kilogram

µg/kg: micrograms per kilogram

1: Indicates reported concentration exceeds the ERL

2: Indicates reported concentration exceeds the ERM

- 6. Beneficial Uses.** The *Basin Plan* and the *Bays and Estuaries Plan* have the following beneficial uses applicable to San Diego Bay that are threatened or potentially threatened by pollutants discharged from the Dischargers' facilities to the Bay and bay sediments:⁴

a. Human Health

- (1) Commercial and Sport Fishing
- (2) Aquaculture
- (3) Shellfish Harvesting

b. Aquatic Life – Benthic Community

⁴ *Basin Plan* Table 2-3 and *Bays and Estuaries Plan* Table 1

- (1) Estuarine Habitat
- (2) Marine Habitat

c. Aquatic – Dependent Wildlife

- (1) Wildlife Habitat
- (2) Rare, Threatened, or Endangered Species

- 7. Threat to Human Health.** San Diego Bay is listed in the *Final 2012 California Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report)*⁵ as impaired due to the presence of elevated levels of PCBs in fish tissue. The listing is based on 18 out of 18 fish tissue samples from the Bay exceeding the Office of Environmental Health Hazard Assessment's (OEHHA's) fish tissue PCB screening value of 20 nanograms per gram (or 0.02 micrograms per gram). Consumption of fish with elevated levels of PCBs can have an adverse impact on human health. Because of the potential impacts to human health, in 2013 OEHHA published a health advisory and guidelines for fish consumption from San Diego Bay warning of unhealthy levels of PCBs in fish tissue from San Diego Bay.⁶ The 2013 OEHHA health advisory was also based on unhealthy levels of mercury in tissue of several of the fish species analyzed. Mercury and PCBs in the sediments are likely one of the sources contributing to the mercury and PCBs found in fish tissue in San Diego Bay.
- 8. Threat to Benthic Community.** The reported sediment chemistry concentrations in Tables 1a, 1b, and 2 shown in bold text are above the Effects Range – Low concentrations (ERL) for the listed constituents. The reported sediment chemistry concentrations shown in bold and shaded text are above the Effects Range – Median concentrations (ERM) for the listed constituents. ERLs and ERMs are guidelines that have been used to evaluate the potential for adverse effects on the benthic community by a given chemical.⁷ At concentrations below the ERL, an adverse effect on the benthic community would be rarely observed. At concentrations greater than the ERL, but below the ERM, it is possible that adverse effects would occur. At concentrations in excess of the ERM, adverse effects are frequently observed. The presence of these constituents detected at concentrations above the ERLs and ERMs in Bay sediments north of the BAE Systems leasehold, as summarized in Tables 1a, 1b, and 2, create or threaten to create a condition of pollution or nuisance in waters of the State.
- 9. Potential Threat to Aquatic-Dependent Wildlife.** Contact with and consumption of pollutants in sediments by the benthic community and plankton can be transferred through the food web to fish and other wildlife. Concentrations of mercury and PCBs in several species of fish in San Diego Bay have already been identified by OEHHA as a potential threat to human health, likely attributed,

⁵ http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2012.shtml

⁶ Office of Environmental Health Hazard Assessment, Health Advisory and Guidelines for Eating Fish from San Diego Bay (San Diego County), October 2013.

⁷ Long, E.R., MacDonald, D.D., Smith, S.L., 1995, Incidence of Adverse Biological Effects Within Ranges of Chemical Concentration in Marine and Estuarine Sediments, Environmental Management Vol. 19, No. 1, pp. 81-97.

in part, to mercury and PCBs in sediments and the potentially impacted benthic community and plankton. The pollutant concentrations in the sediment north of the BAE Systems leasehold may not be protective of the benthic community, and can directly or indirectly have an adverse impact on wildlife.

- 10. Persons Responsible for the Discharge of Waste.** BAE Systems and SDGE (collectively Dischargers) are responsible for discharges of wastes to sediment in San Diego Bay. As described in Findings 3 and 4, various pollutants originated at facilities owned and/or operated by these parties and were discharged directly or transported to San Diego Bay where they cause, or threaten to cause a condition of pollution or nuisance. Through the course of the investigation, additional information may become available that identifies other persons who discharged wastes to the area investigated. The San Diego Water Board reserves and retains the right to amend this Order to include additional persons.
- 11. Basis for Requiring Reports.** Water Code section 13267 provides that the San Diego Water Board may require dischargers, past dischargers, or suspected dischargers to furnish those technical or monitoring reports as the San Diego Water Board may specify, provided that the burden, including costs, of these reports bears a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.
- 12. Need for and Benefit of Reports.** Available sediment data has not delineated the extent and magnitude of the pollutants that are present in the area north of the BAE Systems leasehold. An assessment of the sediment is needed to determine the extent and magnitude of pollutants in bay sediments and to determine if cleanup and abatement activities are required. Technical and monitoring reports are needed to provide information to the San Diego Water Board regarding the nature, extent, and magnitude of pollutants discharged to San Diego Bay sediments. The reports will enable the San Diego Water Board to ascertain the extent and chemical concentrations in sediment north of the BAE Systems leasehold that threaten the benthic community and human health, and potentially threaten wildlife. This information will be used to determine if additional assessments (e.g. sediment triad, bioaccumulation) and/or cleanup and abatement activities are warranted. Based on the nature and possible consequences of the discharges (as described in the Findings above) the burden of providing the required reports, including the costs, bears a reasonable relationship to the need for the reports, and the benefits to be obtained from the reports.
- 13. California Environmental Quality Act Compliance.** The issuance of this Order is an enforcement action taken by a regulatory agency and is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to section 15321(a) (2), chapter 3, title 14 of the California Code of Regulations. This action is also exempt from the provisions of CEQA pursuant to section 15061(b)(3), chapter 3, title 14 because it can be seen with certainty that there is no possibility the activities undertaken to comply with this Order will have a significant effect on the environment.

14. **Qualified Professionals.** The Dischargers' reliance on qualified professionals promotes proper planning, implementation, and long-term cost-effectiveness of investigations. Professionals should be qualified, licensed where applicable, and competent and proficient in the fields pertinent to the required activities. California Business and Professions Code sections 6735, 7835, and 7835.1 require that engineering and geologic evaluations and judgments be performed by or under direction of licensed professionals.
15. **Cost Recovery.** Pursuant to Water Code section 13304(c), and consistent with other statutory and regulatory requirements, including but not limited to Water Code section 13365, the San Diego Water Board is entitled to, and will seek reimbursement for, all reasonable costs actually incurred by the San Diego 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 or a subsequent Order.

IT IS HEREBY ORDERED, pursuant to Water Code sections 13267 and 13304, that BAE System San Diego Ship Repair Inc. and San Diego Gas and Electric Company (collectively Dischargers) must comply with the following directives:

- A. **Sediment Chemistry Assessment Work Plan.** The Dischargers must submit a Sediment Chemistry Assessment Work Plan (Work Plan) to assess the extent and magnitude of contaminated sediments in San Diego Bay to the north of the BAE Systems leasehold caused by their waste discharges. The Work Plan must be received by the San Diego Water Board **no later than 180 days after the date this Order is issued**. The Work Plan must include the following:
 1. **Study Questions.** Provide study questions that the Dischargers will answer to adequately assess the nature, extent, and magnitude of the contaminated sediments in San Diego Bay north of the BAE Systems leasehold. Answers to the study questions will be provided through the implementation of the Work Plan, or through subsequent investigations that may be required by the San Diego Water Board or recommended by the Dischargers, as warranted. The Dischargers may propose any study questions the Dischargers would like to answer by the data to be collected through the implementation of the Work Plan, but the study questions must include, at a minimum, the following:
 - a. **Nature and Extent**
 - (1) What is the current nature, extent, and magnitude of contaminants discharged to sediments in San Diego Bay within and adjacent to the area investigated?
 - (2) If existing data are not sufficient to understand the current nature, extent, and magnitude of contaminants discharged (i.e., a data gap exists), what sampling strategy is needed to fill that gap?
 - (3) What activities are needed to identify the data to characterize the nature, extent, and magnitude of contaminants discharged in the area discussed above?

b. Potential Sources

- (1) What are the potential historical and current sources that have discharged or are currently discharging to San Diego Bay within and adjacent to the area investigated?
- (2) If existing data are not sufficient to understand potential historical and current sources, what sampling strategy is needed to fill that gap?
- (3) What activities are needed to identify the data to characterize the potential historical and current sources within and adjacent to the area investigated?

c. Pathway and Contaminant Transport

- (1) If contaminants and ongoing sources are identified, what are the pathways for contaminant transport to and within San Diego Bay within and adjacent to the area investigated?
- (2) If existing data are not sufficient to understand the transport of potential historical and current sources of contaminants, what sampling strategy is needed to fill that gap?
- (3) What activities are needed to identify the data to characterize the transport of potential historical and current sources of contaminants to and within San Diego Bay within and adjacent to the area investigated?

2. **Map.** Provide one or more maps of the Dischargers' facilities that discharged or potentially discharged to San Diego Bay, showing the following:
 - a. Locations of all current and historic industrial process waste discharge points from the Dischargers' facilities;
 - b. Locations of all current and historic storm water conveyance features, including inlets and discharge points from the facilities, and any former utilities and floor drain locations if they are, or were connected to the storm water conveyance system; and
 - c. Locations and information that can be provided on a map, where appropriate, for the Work Plan requirements below.
3. **Historical Waste Discharges Assessment.** Provide an assessment of the potential pollutants that may have been discharged to and/or removed from the Bay, including the following information:
 - a. For the locations of the current and historic industrial process waste discharge points from the Dischargers' facilities, list all the chemicals, materials, and wastes (including paints, solvents, petroleum products, abrasives, metals, treated woods, etc.) that have been stored or used in the

vicinity of the areas that may have contributed to discharges to San Diego Bay. For each item on the list, include the following information:

- (1) The location(s) where the chemical, material, or waste was stored;
 - (2) The location(s) where the chemical, material, or waste was used;
 - (3) The known, suspected, and potential pollutants that may be generated from the storage or use of the chemical, material, or waste;
 - (4) The potential pathways that could result in a discharge of the potential pollutants to the Bay; and
 - (5) The structural and non-structural best management practices (BMPs) that have been implemented, and the date those BMPs were initiated, to prevent or minimize the discharge of the potential pollutants to the Bay.
- b.** Descriptions of any operations that occurred near the Bay, and the chemicals, materials, and wastes (including sediments in catch basins) that are known or suspected to have been spilled, aerially transported, or exposed to storm water and discharged or potentially discharged to the Bay.
 - c.** Data collected by or available to the Dischargers for industrial process waste discharged directly or indirectly to the San Diego Bay that may have contributed to pollutants found in Bay sediments.
 - d.** Data collected by or available to the Dischargers for storm water and non-storm water discharged directly or indirectly to the San Diego Bay that may have contributed to pollutants found in Bay sediments.
 - e.** Data collected by or available to the Dischargers for industrial process waste, storm water, and non-storm water discharges diverted to the sanitary sewer system that otherwise would have been directly or indirectly discharged to the San Diego Bay that may have contributed to pollutants found in Bay sediments.
 - f.** Descriptions of known or suspected sources of waste discharges (including materials in buildings and around the facility, and sediments in catch basins) that may have historically contributed or are currently contributing to pollutants in Bay sediments.
 - g.** Descriptions of historical dredging projects that removed sediments within the area being investigated, as well as future dredging projects that may be implemented within the area.
4. **Existing Monitoring.** Provide a summary of any monitoring that has been and is being conducted by the Dischargers, or known of by the Dischargers in and around the area of San Diego Bay being investigated, including the following information:

- a. Descriptions of any effluent discharge, storm water discharge, non-storm water discharge, Bay water column, and Bay sediment monitoring already conducted;
 - b. Maps and tables that summarize the results of any effluent discharge, storm water discharge, non-storm water discharge, Bay water column, and Bay sediment monitoring already conducted;
 - c. Descriptions and summary of any other data, special studies, or monitoring already conducted that may contribute to assessing the physical, biological, and chemical integrity of the area of San Diego Bay being investigated; and
 - d. Descriptions of any current and future monitoring programs that are already planned to be conducted within the area of San Diego Bay being investigated.
5. **Preliminary Conceptual Site Model.** Based on the known and suspected historical waste discharges and existing monitoring data, provide a preliminary Conceptual Site Model that includes the following:
 - a. A written and pictorial representation of the historical and current waste discharge scenarios;
 - b. A preliminary estimate of the distribution of pollutants to the north of the BAE Systems leasehold, transport and fate of pollutants in the water column and sediment, and the potential receptors and pathways of exposure;
 - c. A discussion of existing monitoring data interpretations;
 - d. Data gaps identified in the existing monitoring and the preliminary Conceptual Site Model; and
 - e. Level of uncertainty in the preliminary Conceptual Site Model based on identified data gaps.
6. **Sediment Sampling and Analysis Plan.** Provide a Sediment Sampling and Analysis Plan (SAP) that includes the following:
 - a. Identify on a map all catch basins within the Dischargers' facilities that are currently or have been historically connected to storm water outfalls that are discharging or have discharged to the San Diego Bay. Identify the proposed catch basin sediment sampling locations that will be used to characterize potential watershed sources of pollutants and/or contaminated sediments that have discharged or are discharging to San Diego Bay.
 - b. Identify the proposed sediment sampling locations that will be used to determine the extent, magnitude, and concentration gradients of contaminated sediments in the San Diego Bay north of the BAE Systems leasehold. Proposed sediment sampling locations must be identified on a map, and approximate latitude and longitude coordinates must be provided. Proposed locations must be capable of characterizing the extent and magnitude of

contaminated sediment that may be attributable to the Dischargers from the shoreline into the Bay, and to the north of the BAE Systems leasehold Proposed San Diego Bay sediment sampling locations must be placed as follows:

- (1) North of the BAE Systems leasehold boundary and west of the shoreline, spaced at distances that will adequately characterize the nature and extent of sediment chemical constituents, identify sediment chemical constituents that may be attributable to the Dischargers and identify areas of potential concern;
 - (2) In areas of known or suspected contaminant sources and releases;
 - (3) In areas where data can be collected to potentially answer the study questions; and
 - (4) In areas where data can be collected to potentially address data gaps identified in the preliminary Conceptual Site Model.
- c. For each proposed San Diego Bay sediment sampling location identified:
- (1) At least one sample must be collected from surface sediments in accordance with the *Bays and Estuaries Plan*, sections V.D.1, 3, and 5;
 - (2) At least one sample must be collected from each one-foot depth interval to at least 5 feet below the Bay sediment surface or until bedrock is encountered; and
 - (3) Samples collected at depth intervals greater than 3 feet below the Bay sediment surface should be archived as frozen samples, and are only required to be analyzed in accordance with Directive A.6.d if elevated levels of chemical constituents are found in the 3 foot depth interval sample.
- d. Sediment samples from catch basins and San Diego Bay must be analyzed in accordance with the *Bays and Estuaries Plan*, section V.H.1, and for the following:
- (1) Grain size analysis,
 - (2) Physical parameters,
 - (3) Total organic carbon,
 - (4) Target Analyte List (TAL) Metals,
 - (5) Pesticides,
 - (6) PAHs,

- (7) Total PCBs (all 209 individual PCB congeners),⁸
- (8) Total PCTs, and
- (9) Any additional pollutants identified by the Dischargers or the San Diego Water Board for analysis during the development of the Work Plan.

e. If the Dischargers determine additional information (e.g. bioavailability of pollutants) is warranted at this time to fill data gaps in the preliminary Conceptual Site Model or to answer the study questions, include as activities in the Work Plan any additional data collection, special studies, or monitoring that will be included and implemented as part of the Work Plan.

7. **Quality Assurance Project Plan.** Provide a Quality Assurance Project Plan describing the project objectives and organization, functional activities, and the quality assurance / quality control (QA/QC) protocols for the monitoring to be conducted in accordance with the Sediment SAP.
8. **Schedule.** Provide a schedule of activities for completion of the Work Plan. At a minimum, the schedule must specify the following:
 - a. Dates by which the sediment sampling activities for the investigation are expected to begin and be completed. Sediment samples must be collected within one month of the sediment sampling activities scheduled for the investigation within the CMSD leasehold;
 - b. Dates by which any additional data collection, special studies, or monitoring proposed by the Dischargers pursuant to Directive A.6.e are expected to begin and be completed;
 - c. Date by which laboratory analysis of the sediment samples are expected to be completed; and
 - d. Date by which laboratory analysis for any additional data collection, special studies, or monitoring proposed by the Dischargers pursuant to Directive A.6.e are expected to be completed.

B. Implementation of Sediment Chemistry Assessment Work Plan. The Dischargers must implement the Work Plan in compliance with the schedule in the Work Plan as approved by the San Diego Water Board, unless otherwise directed in writing by the Board. If unforeseen circumstances arise that cause delays, the Dischargers may request modifications to the Work Plan schedule. Any proposed changes to the schedule must be approved by the Board.

C. Sediment Chemistry Assessment Report. The Dischargers must prepare a Sediment Chemistry Assessment Report (Report) describing the results from implementing the Work Plan. The Report must be received by the San Diego Water

⁸ As analyzed and reported by EPA Method 1668.

Board **no later than 180 days after the last scheduled activity in the Work Plan is completed.** The Report must contain the following:

1. **Sampling Locations.** For each sediment sampling location, provide the following information:
 - a. Location shown on a map;
 - b. Latitude and longitude; and
 - c. Depth intervals sampled and analyzed.
2. **Analytical Results.** Provide the results of all analyses performed, and summarize in tabular format and on maps, as appropriate. Provide the laboratory analytical method used for each analysis.
3. **Conclusions.** Provide conclusions for the San Diego Water Board to consider based on the analytical results from implementation of the Work Plan in the context of the Work Plan study questions, historical waste discharges assessment, and data from existing monitoring. The Dischargers must provide data interpretations and study conclusions for which there is agreement by all Dischargers, if any. Each Discharger is also encouraged to provide its own alternative data interpretations and study conclusions for which there is not agreement by all Dischargers, if any, for the San Diego Water Board to consider. The data interpretations and study conclusions must include the following:
 - a. Maps and discussion of the sediments with detectable concentrations of chemical constituents analyzed;
 - b. Identification of areas that may require additional investigation and/or remedial action;
 - c. Updated Conceptual Site Model;
 - d. Answers for each of the study questions;
 - e. Identification of remaining data gaps in updated Conceptual Site Model; and
 - f. Level of uncertainty of conclusions based on remaining data gaps.
4. **Recommendations.** Provide recommendations for the San Diego Water Board to consider based on the conclusions. The Dischargers must provide recommendations for which there is agreement by all Dischargers, if any. Each Discharger is also encouraged to provide its own alternative recommendations for which there is not agreement by all Dischargers, if any, for the San Diego Water Board to consider. The recommendations must include the following:
 - a. Criteria for determining where cleanup activities may be warranted;
 - b. Changes to the study questions, if any;

- c. Studies or data for filling data gaps in the updated Conceptual Site Model, if any;
- d. Studies or data needed to better answer study questions, if any;
- e. Studies or data that may be needed to determine where cleanup activities are warranted, if any; and
- f. Studies or data that may be needed to establish appropriate cleanup levels, if cleanup is warranted.

D. Compliance Dates. The compliance dates for the requirements of this Order are summarized in Table 3.

Table 3. Compliance Dates

Requirement	Compliance Due Date
Directive A – Submittal of the Sediment Chemistry Assessment Work Plan	180 days after the date this Order is issued by the San Diego Water Board
Directive B – Implementation of the Sediment Chemistry Assessment Work Plan	According to the schedule in the approved Work Plan
Directive C – Submittal of the Sediment Chemistry Assessment Report	180 days after completion of the last scheduled Work Plan activity

E. Penalty of Perjury Statement. All reports must be signed by the Dischargers' corporate officers or duly authorized representatives, and must include the following statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge:

"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."

F. Document Submittals. The Electronic Reporting Regulations require electronic submission of any report or data required by a regulatory agency from a cleanup site after July 1, 2005.⁹ The electronic document submittals must be uploaded on or prior to the regulatory compliance due dates set forth in this Order or addenda thereto. To comply with these requirements, the Dischargers must upload to the GeoTracker database. The Dischargers must submit the required documents as follows:

1. **GeoTracker.** All information submitted to the San Diego Water Board in compliance with this Order is required to be submitted electronically to the

⁹ California Code of Regulations title 23, chapter 30, division 3 and title 27, division 3

GeoTracker database (<https://geotracker.waterboards.ca.gov/esi>) under GeoTracker Global ID **T10000008866**. The Dischargers must upload to the GeoTracker database the following minimum information:

- a. Reports.** A complete copy of all work plans, assessment, monitoring, and cleanup reports, including the signed transmittal letters, professional certifications, and all data presented in the reports in PDF format, and converted to text searchable format. Reports larger than 100 megabytes (MB) need to be divided into separate files at logical places in the report to keep the file sizes under 100 MB.
 - b. Site Maps.** A site map, as a stand-alone document, including notes, legends, north arrow, and other data as appropriate to ensure that the site map is clear and understandable in GIF, JPG, TIF, or PDF formats. When appropriate, the Dischargers should provide required information on multiple site maps.
 - c. Laboratory Analytical Data.** Analytical data (including geochemical data) for all Bay sediment and water samples in Electronic Data File (EDF) format.
 2. **California Environmental Data Exchange Network.** The Dischargers must also submit the applicable data collected from the implementation of the Work Plan in the appropriate format for upload into the California Environmental Data Exchange Network database (<http://www.ceden.org/>),¹⁰ or if directed by the Executive Officer, to an alternative State database.
 3. **Other Submittals.** The San Diego Water Board may also request hard copy and/or electronic copies on CD or other appropriate media, including electronic mail (email).
 - a. Hard Copies and CDs.** If requested by the San Diego Water Board, the Dischargers must also provide any or all of the following to the Board: a hard copy of the complete document, a hard copy of the cover/transmittal letter, a hard copy of oversized drawings or maps, and an electronic copy (on a CD or other appropriate media) of the complete document.
 - b. Electronic Mail.** If requested by the San Diego Water Board, the Dischargers must also submit a copy (in a text-searchable PDF file) of all documents including signed transmittal letters, professional certifications, and all data presented in the documents to: sandiego@waterboards.ca.gov.
 4. **Compliance Determination for Document Submittals.** Upon receipt of the documents, the San Diego Water Board will use the email date and time, upload date and time, and/or receipt date and time to determine compliance with the regulatory due dates specified in this Order.
- G. Violation Reports.** If the Dischargers violate any requirement of this Order, then the Dischargers must notify the San Diego Water Board office by telephone as soon as practicable once the Dischargers have knowledge of the violation. The San Diego

¹⁰ Check the CEDEN website for information on procedures for submitting data for upload to CEDEN.

Water Board may, depending on violation severity, require the Dischargers to submit a separate technical report on the violation within five working days of the telephone notification.

H. Other Reports. The Dischargers must notify the San Diego Water Board in writing prior to any Discharger's facilities' activities that have the potential to cause further migration of pollutants.

I. Provisions

1. **Waste Management.** The Dischargers must properly manage, store, treat, and dispose of contaminated sediments in accordance with applicable federal, State, and local laws and regulations. The storage, handling, treatment, or disposal of sediment associated with the assessment required by this Order must not create conditions of nuisance as defined in Water Code section 13050(m).
2. **Contractor/Consultant Qualifications.** All reports, plans, and documents required under this Order must be prepared under the direction of appropriately qualified professionals. A statement of qualifications and license numbers, if applicable, of the responsible lead professional and all professionals making significant and/or substantive contributions must be included in the report submitted by the Dischargers. The lead professional performing the engineering and geologic evaluations and judgments must sign and affix their professional geologist or civil engineer registration stamp to all plans, technical reports, or documents submitted to the San Diego Water Board.
3. **Laboratory Qualifications.** All samples must be analyzed by California State-certified laboratories using methods approved by the United States Environmental Protection Agency (USEPA) for the type of analysis to be performed.
4. **Laboratory Analytical Reports.** 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 reports;
 - b. Complete laboratory QA/QC reports;
 - c. A discussion of the sample and QA/QC data; and
 - d. A transmittal letter that indicates whether or not all the analytical work was supervised by the director of the laboratory, and contains the following statement:

"All analyses were conducted at a laboratory certified for such analyses by the California Department of Public Health in accordance with USEPA procedures."

5. **Analytical Methods.** Specific methods of analysis must be identified in the technical and monitoring reports. If the Dischargers propose to use methods or

test procedures other than those included in the most current version of USEPA's "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-486" or Code of Federal Regulations (CFR), title 40, part 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants," the exact methodology must be submitted for review and must be approved by the San Diego Water Board prior to use.

6. **Reporting of Changed Owner or Operator.** The Dischargers must notify the San Diego Water Board of any changes in site occupancy or ownership associated with the property described in this Order.

J. Notifications

1. **Cost Recovery.** Upon receipt of invoices, and in accordance with instruction therein, the Dischargers must reimburse the State Water Board for all reasonable costs incurred by the San Diego Water Board to investigate discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order and consistent with the annual estimation of work.
2. **All Applicable Permits.** The Dischargers must obtain all permits and access agreements needed to implement the requirements of this Order. This Order does not relieve the Dischargers of the responsibility to obtain permits or other entitlements to perform necessary assessment activities. This includes, but is not limited to, actions that are subject to local, State, and/or federal discretionary review and permitting.
3. **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 Order.
4. **Enforcement Notification.** Failure to comply with requirements of this Order may subject the Dischargers to enforcement action, including but not limited to administrative enforcement orders requiring the Dischargers to cease and desist from violations, imposition of administrative civil liability, pursuant to Water Code section 13268 in an amount not to exceed \$1,000 for each day in which the violation occurs, referral to the State Attorney General for injunctive relief, and referral to the District Attorney for criminal prosecution. The Dischargers are jointly and severally liable for the entire amount of the administrative civil liability. The San Diego Water Board reserves the right to seek administrative civil liability from any or all of the Dischargers.
5. **Requesting Administrative Review by the State Water Board:** Any person affected by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and title 23, section 2050. The petition must be received by the State Water Board (Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812) within 30 **calendar days** of the date of this Order. Copies

of the laws and regulations applicable to filing petitions will be provided upon request.¹¹

Ordered by:

<p style="text-align: center;">_____/s/_____ James G. Smith Assistant Executive Officer</p>	<p style="text-align: center;">_____ 4 August 2017 Date</p>
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¹¹ Nothing in this Order prevents the Dischargers from later petitioning the State Water Board to review other future San Diego Water Board orders regarding the area of San Diego Bay being investigated, including but not limited to subsequent investigative orders and/or cleanup or abatement orders, if any. Upon such petition, the San Diego Water Board will not assert that the Dischargers have previously waived or forfeited their right to petition the San Diego Water Board's action or failure to act under Water Code section 13320. Further, upon such petition, the San Diego Water Board will not assert that the Dischargers are precluded from petitioning for review of future orders by any failure to petition for review of this Order.