COVER PAGE

FOR

VOLUME 1 of 3

OF THE

Draft Technical Report for

TENTATIVE CLEANUP AND ABATEMENT ORDER NO. ~~R9-2011-0001~~R9-2012-0024

~~September 15, 2010~~March 14, 2012

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SAN DIEGO REGION

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Draft Technical Report for

TENTATIVE
CLEANUP AND ABATEMENT
ORDER NO. ~~R9-2011-0001~~R9-2012-0024

For the Shipyard Sediment Site
San Diego Bay, San Diego, CA

Volume 1 of 3

Adopted by the
California Regional Water Quality Control Board
San Diego Region
on ____________, 2012~~1~~

Cover Design by Sharon Norton, Graphic Designer

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Acronyms & Abbreviations

AET	Apparent Effects Threshold
AFFF	Aqueous Film Forming Foam
ASTM	American Society of Testing Material
ANOVA	Analysis of Variance
AQUA	Aquaculture Beneficial Use
ARCO	Atlantic Richfield Company
ASTs	Aboveground Storage Tanks
AT & SF	Atchison, Topeka, and Santa Fe Railroad
AVS/SEM	Acid Volatile Sulfide / Simultaneously Extracted Metals
BAF	Biota Accumulation Factor
BAP	Benzo[a]pyrene
Bight 98	Southern California Bight 1998 Regional Marine Monitoring Survey
BIOL	Preservation of Biological Habitats of Special Significance
BMPs	Best Management Practices
BPJ	Best Professional Judgment
BRI-E	Benthic Response Index for Embayments
BSAFs	Biota-to-Sediment Accumulation Factors
BTAG	U.S. Navy/U.S. EPA Region 9 Biological Technical Assistance Group
CAD	Confined Aquatic Disposal
CCC	Criterion Continuous Concentration
CCR	California Code of Regulation
CDFs	Confined Disposal Facilities
CEQA	California Environmental Quality Act
CMC	Criterion Maximum Concentration
CNRSW	Commander Navy Region Southwest
COCs	Contaminants of Concern
COMM	Commercial and Sport Fishing Beneficial Use
CoPC	Chemicals of Potential Concern
CSF	Cancer Slope Factor
CTR	California Toxics Rule
CWA	Clean Water Act
CWC	California Water Code
DFG	California Department of Fish and Game
DRO	Diesel Range Organics
DTSC	California Department of Toxic Substances Control
DWQ	Division of Water Quality
EC50	Median Effective Concentration
EMC	Event Mean Concentration
EqP	Equilibrium Partitioning Approach
ERL	Effects Range Low
ERM	Effects Range Medium
EST	Estuarine Habitat Beneficial Use
FACs	Fluorescent Aromatic Compounds
FSP	Field Sampling Plan
GRO	Gasoline Range Organics
HPAH	High Molecular Weight Polynuclear Aromatic Hydrocarbons
HQ	Hazard Quotient
IND	Industrial Service Supply Beneficial Use
IR	Ingestion Rate
IRIS	Integrated Risk Information System
Kp	Partition Coefficients
LAET	Lowest Apparent Effects Threshold
LC50	Median Lethal Concentration
LOAELs	Low-Adverse-Effects-Levels
LOE	Lines of Evidence
LPAH	Low Molecular Weight Polynuclear Aromatic Hydrocarbons
LPL	Lower Prediction Limit
MAR	Marine Habitat Beneficial Use
MARCO	Marine Construction and Design Company
MEK	Methyl Ethyl Ketone
MIGR	Migration of Aquatic Organisms Beneficial Use
MS4	Municipal Separate Storm Sewer System
MTDB	Metropolitan Transit Development Board

NASSCO	National Steel and Shipbuilding Company
NAV	Navigation Beneficial Use
NAVSTA	Naval Station
NOAA	National Oceanic and Atmospheric Administration
NOAELs	No-Adverse-Effects-Levels
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NRTAs	Natural Resource Trustees Agencies
NTR	National Toxics Rule
OHHEA	Office of Environmental Health and Hazard Assessment
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PCTs	Polychlorinated Terphenyls
PL	Prediction Limit
PPPAH	Priority Pollutant Polynuclear Aromatic Hydrocarbon
PRGs	Preliminary Remediation Goals
PW	Pore Water
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/ Quality Control
RAP	Remedial Action Plan
RARE	Rare, Threatened or Endangered Species Beneficial Use
REC1	Contact Water Recreation Beneficial Use
REC2	Non Contact Water Recreation Beneficial Use
RfD	Reference Dose
RLs	Response Levels
RME	Reasonable Maximum Exposure
RRO	Residual Range Organics
SCCWRP	Southern California Coastal Water Research Project
SDG&E	San Diego Gas and Electric
SDMC	San Diego Marine Construction Company
SDUPD	San Diego Unified Port District
SHELL	Shellfish Harvesting Beneficial Use
SQGs	Sediment Quality Guidelines
SQGQ	Sediment Quality Guideline Quotient
SS-MEQ	Site-Specific Median Effects Quotient
SVOCs	Semi Volatile Organic Compounds
S-W Diversity	Shannon-Weiner Diversity Index
SWAC	Surface-Area Weighted Average Concentration
SWI	Sediment Water Interface
SWM	Southwest Marine, Inc.
SWCS	Storm Water Conveyance System
SWPPP	Storm Water Pollution Prevention Plan
SWPMP	Storm Water Pollution Monitoring Plan
TBT	Tributyltin
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TR	Tissue Residue (biota-water-sediment equilibrium partitioning approach)
TRGs	Tissue Residue Guidelines
TRI	Toxic Release Inventory
Triad	Sediment Quality Triad
TRV	Toxicity Reference Value
TSCA	Toxic Substances Control Act
TSS	Total Suspended Solids
TUc	Toxic Unit Chronic
UPL	Upper Prediction Limit
U.S. EPA	U. S. Environmental Protection Agency
U.S. FWS	U. S. Fish and Wildlife Service
VOCs	Volatile Organic Compounds
WDRs	Waste Discharge Requirements
WILD	Wildlife Habitat Beneficial Use
WOE	Weight of Evidence

Preface

~~The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is considering development and issuance of a cleanup and abatement order for discharges of metals and other pollutant wastes to San Diego Bay marine sediment and waters at the Shipyard Sediment Site. On April 29, 2005, the San Diego Water Board circulated for public review and comment a tentative version of the cleanup and abatement order (titled tentative Cleanup and Abatement (CAO) Order No. R9-2005-0126). A copy of this document is posted on the San Diego Water Board website at http://www.waterboards.ca.gov/sandiego.~~

~~Based on the San Diego Water Board's consideration of public comments submitted on the April 29, 2005, draft CAO and other information, a revised tentative CAO No. R9-2005-0126 and a supporting draft Technical Report (DTR), dated April 4, 2008, were prepared and released for public review. A copy of the revised CAO and DTR is posted on the San Diego Water Board website at http://www.waterboards.ca.gov/sandiego.~~

~~On June 9, 2008, Mr. David King, San Diego Water Board Member and Presiding Officer of the prehearing proceedings for this tentative CAO, referred the proceedings to confidential mediation. The Mediation Parties, which included the San Diego Water Board Cleanup Team (Cleanup Team) and other Parties to whom the tentative CAO is directed, through the course of mediation, reached agreement on appropriate cleanup levels, the remedial design, remediation and post-remediation monitoring requirements, and a remedial action implementation schedule. Those agreements are contained in tentative CAO No. R9-2010-0002 and the supporting DTR, which were released for public review on December 22, 2009.~~

~~On September 15, 2010 the San Diego Water Board released a revised version of the tentative CAO (see tentative CAO No. R9-2011-0001) and supporting DTR. This version updates and clarifies the tentative CAO and DTR which was previously released on December 22, 2010.~~

~~The DTR contained herein is the September 15, 2010 version and provides the rationale and factual information supporting the findings of the tentative CAO No. R9-2011-0001. The text of each CAO finding is presented first followed by a summary of the rationale and factual evidence supporting the finding. A copy of tentative CAO No. R9-2011-0001 and this DTR is posted on the San Diego Water Board website at http://www.waterboards.ca.gov/sandiego.~~

~~This September 15, 2010 release of a tentative CAO and draft DTR is not intended to fulfill the San Diego Water Board's formal procedures for adopting a CAO in this matter under the Porter-Cologne Water Quality Control Act. A public hearing schedule and deadline for public comments on a finalized tentative CAO and draft DTR will be established in a future ruling by the San Diego Water Board's Presiding Officer in this matter.~~

~~Prior to the issuance of a final CAO and DTR in this matter, the San Diego Water Board will first release a public hearing notice and a final tentative CAO, a final DTR, and a draft Environmental Impact Report (EIR) for public review and comment. The San Diego Water Board will provide an opportunity for all Parties, to whom the CAO is directed or otherwise designated, and interested persons to comment on issues pertaining to the tentative CAO, DTR, draft EIR and other issues described in the hearing notice. The San Diego Water Board's consideration of testimony and written submittals by Parties and interested persons may result in revisions to the tentative CAO and the supporting DTR and draft EIR during the course of the hearing proceedings. Thus the finalized version of the tentative CAO that is ultimately considered for adoption by the San Diego Water Board at the conclusion of the proceedings may differ from the current September 15, 2010 version of the tentative CAO.~~

The Draft Technical Report (DTR) contained herein is the culmination of revisions over several years to the DTR first released to support to Tentative Cleanup and Abatement Order (TCAO) No. R9-2005-0126 in January 2005. This Technical Report provides the rationale and factual information supporting the findings of the tentative CAO No. R9-2012-0024. The text of each CAO finding is presented first, followed by a summary of the rationale and factual evidence supporting the finding. A copy of TCAO No. R9-2012-0024 and this DTR, as well as prior versions are posted on the San Diego Water Board website at http://www.waterboards.ca.gov/sandiego. TCAO No. R9-2012-0024 incorporates the Technical Report as a finding in support of TCAO No. R9-2012-0024 as if fully set forth therein.

1. Finding 1: Waste Discharge

Finding 1 of CAO No. ~~R9-2011-0001~~R9-2012-0024 states:

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

1.1. Shipyard Sediment Site

Discharges of metals and other pollutant[2] wastes to San Diego Bay marine sediment and water have resulted in the accumulation of pollutants in bay bottom marine sediment, which creates conditions that adversely impacts beneficial uses corresponding to three target receptors: aquatic life, aquatic-dependent wildlife, and human health. The sediment containing elevated levels of pollutants is referred to in this Technical Report as "contaminated marine sediment."[3]

The contaminated marine sediments are located along the eastern shore of central San Diego Bay and encompass an area extending approximately from the Sampson Street Extension to the northwest and Chollas Creek to the southeast and from the shoreline out to the San Diego Bay

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

[2] Any type of industrial, municipal, and agricultural waste discharged into water is a pollutant. The term "pollutant" is defined in Clean Water Act section 502(6) as dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, "chemical wastes," biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. The term "pollutant" has been further broadened by the NPDES regulations (40 CFR 122) and court cases. As used in this technical report, the term "pollutant" is intended to refer to a substance that meets the definition of "waste" under Water Code section 13050(d).

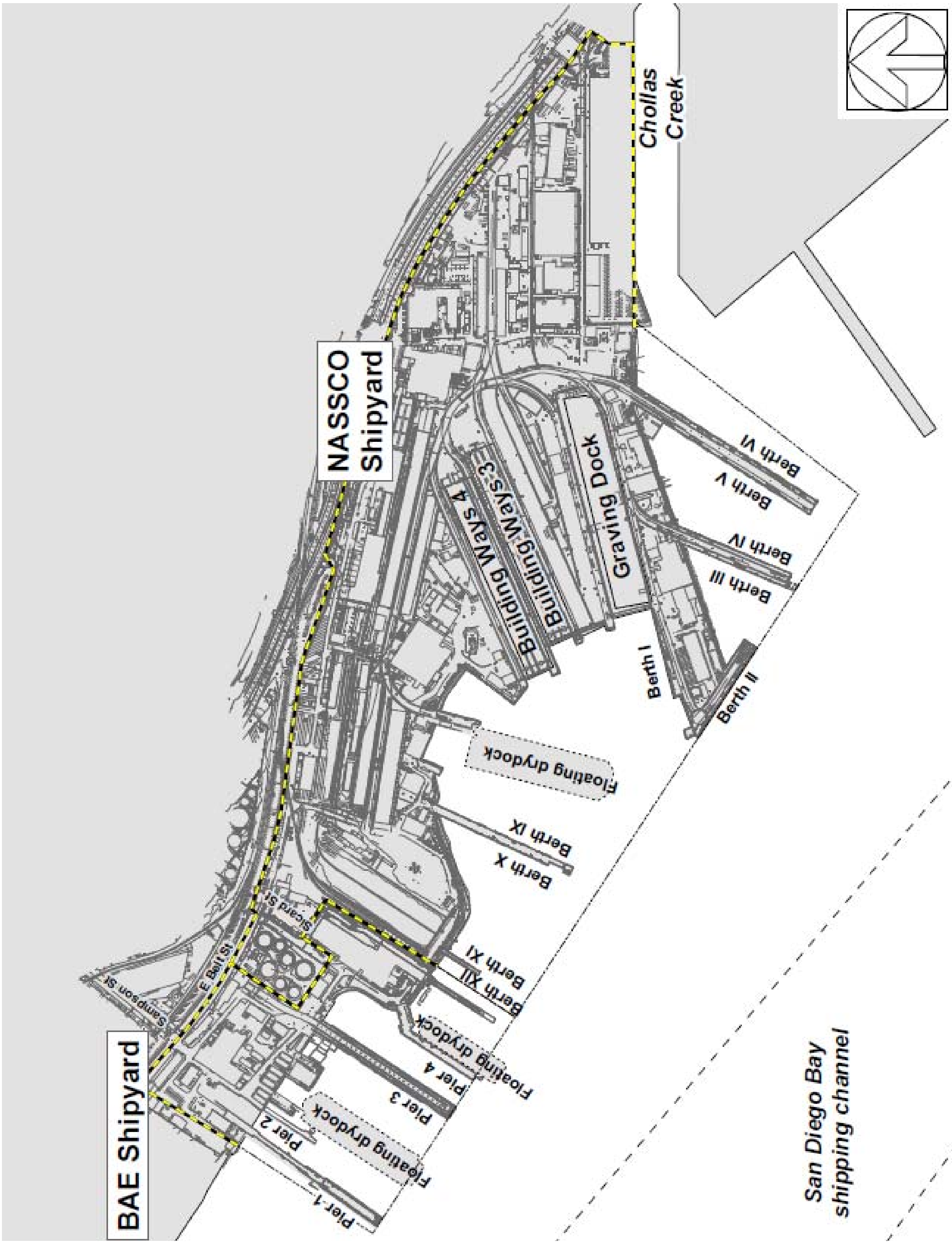
[3] As used in this Technical Report, the term "contaminated marine sediment" is intended to refer to sediment that either meets the definition of "contamination" under Water Code section 13050(k) or that creates, or threatens to create, a condition of "pollution" under Water Code section 13050(l).

main shipping channel on the southwest. This area is referred to by the term "Shipyard Sediment Site" in the Cleanup and Abatement Order and throughout this Technical Report.

The Shipyard Sediment Site is located on the eastern shore of central San Diego Bay, approximately one half mile south of the Coronado Bridge and half the total distance into the Bay. The NASSCO and BAE Systems leaseholds, portions of which lie in the Shipyard Sediment Site, are adjacent to each other, have a similar range of water depths, and lie within the same hydrologic and biogeographic area. The total combined San Diego Bay water acres included in the NASSCO and BAE Systems leaseholds is approximately 56 acres. The Shipyard Sediment Site encompasses the entire 56 water acres of the NASCCO and BAE Systems leaseholds. Also included in the Shipyard Sediment Site investigation were areas just outside the northwestern boundary of the BAE Systems leasehold and areas west of the leasehold near the eastern edge of the shipping channel. The vertical and horizontal extent of the Shipyard Sediment Site includes bay bottom marine sediment with pollutant levels greater than "background conditions"[4] found in relatively "clean" regions of San Diego Bay and includes areas that extend beyond the NASSCO and BAE Systems leaseholds. This area is referred to as the Shipyard Sediment Site Study Area. A map of the area is provided in Figure 1-1 below.

[4] The term background conditions, as used in this Technical Report, refers to sediment quality conditions found in areas of San Diego Bay that are remote from known pollution sources. A discussion of the factors considered in defining San Diego Bay background conditions for use in identifying areas at the Shipyard Sediment Site that may require remediation or cleanup is contained in Sections 16 and 29 of the Technical Report.

Figure 1-1 Shipyard Sediment Area



1.2. Elevated Pollutant Levels

The San Diego Water Board compared sediment chemistry levels found at the Shipyard Sediment Site to various sediment quality guidelines (SQGs) as well as background reference sediment chemistry levels found in other parts of present-day San Diego Bay. Consistent with the principles described in Section 17.1, the San Diego Water Board selected stations to establish a reference condition reflective of the sediment quality condition that existed within and adjacent to the Shipyard Sediment Site before the discharges occurred. This contemporary ambient background condition is not representative of pristine pre-industrial background condition as it considers the global spread of pollutants in the bay from current and historical discharges. Factoring in low levels of pollutants at a reference site is consistent with U.S. EPA guidelines on selecting and establishing reference conditions. The purpose of this comparison was to evaluate 1) if sediment chemistry levels at the Shipyard Sediment Site chemistry levels exceeded background conditions in San Diego Bay and 2) the potential threat to aquatic life from chemical pollutants detected in the marine sediment.

Sediment quality guidelines (SQGs) are reference values above which sediment pollutant concentrations could pose a significant threat to aquatic life and can be used to evaluate sediment chemistry data. SQGs have been used by regulatory agencies, research institutions, and environmental organizations throughout the United States to identify contamination hot spots, characterize the suitability of dredge material for disposal, and establish goals for sediment cleanup and source control (Vidal and Bay, 2005).

The San Diego Water Board used the following empirical SQGs to evaluate chemical levels at Shipyard Sediment Site stations: 1) Effects Range-Median (ERM) for metals (Long et al., 1998), 2) Consensus midrange effects concentration for PAHs and PCBs (Swartz, 1999; MacDonald et al., 2000), and 3) Sediment Quality Guideline Quotient (SQGQ) for chemical mixtures. The San Diego Water Board also used chemistry levels found in background reference areas of San Diego Bay to compare Shipyard Sediment Site sediment chemistry levels. The results of this evaluation indicated that pollutant levels for arsenic, copper, lead, mercury, zinc, PCBs, PAHs, and TBT in the sediment at the Shipyard Sediment Site are elevated and represent a potential threat to aquatic life. Additional details on SQGs and chemistry levels found at the Shipyard Sediment Site are provided in Sections 18 and 20 of this Technical Report.

1.3. Responsible Parties

NASSCO, BAE Systems, the City of San Diego, ~~Star & Crescent Boat Company,~~ Campbell Industries, San Diego Gas and Electric (SDG&E), a subsidiary of Sempra Energy Company, the United States Navy, and the San Diego Unified Port District (Port District) are each named as dischargers in the Cleanup and Abatement Order, responsible for the cleanup of waste and the abatement of the effects of waste discharges at the Shipyard Sediment Site. This section provides an overview of the general principles applied by the San Diego Water Board in determining the responsible parties or Dischargers identified in the Cleanup and Abatement Order.

1.3.1. Water Code Section 13304

California Water Code (~~CWC~~Water Code) section 13304 contains the cleanup and abatement authority of the Regional Water Quality Control Boards (Regional Water Boards), including the San Diego Water Board. Section 13304(a) provides that any person who has discharged or discharges waste[5] into waters of the state in violation of any waste discharge requirement[6] or other order or prohibition issued by a Regional Water Board or the State Water Resources Control Board (State Water Board) or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution[7] or nuisance[8] may be required to clean up the discharge and abate the effects thereof. This section authorizes the San Diego Water Board to require complete cleanup of all waste discharged and restoration of affected water to background conditions (i.e., the water quality that existed before the discharge).[9]

1.3.2. Resolution No. 92-49

State Water Board Resolution No. 92-49 (*Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*) describes the policies and procedures that apply to the cleanup and abatement of all types of discharges subject to ~~CWC~~ Water Code section 13304 (SWRCB, 1996). Resolution No. 92-49 provides that the San Diego Water Board shall, in its decisions on who shall be held accountable for the cleanup and abatement of waste, use any relevant evidence, whether direct or circumstantial, including, but not limited to, evidence in the following categories:

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5 "Waste" is very broadly defined in Water Code section 13050(d) "such that it includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal". See Sections 2 through 10 for discussion of the specific waste discharges. See Section 36 regarding legal and regulatory authority.

6 The term waste discharge requirements include those which implement the National Pollutant Discharge Elimination System (NPDES).

7 Pollution is defined in Water Code section 13050(1) as "an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following: (A) The waters for beneficial uses, (B) Facilities which serve these beneficial uses." Pollution may include "contamination."

8 Nuisance is defined in Water Code section 13050(m) "… anything which: (1) is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property, and (2) affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal, and (3) occurs during or as a result of the treatment or disposal of wastes."

9 Finding 4 of State Water Resources Control Board Resolution No. 92-49, *Policies And Procedures For Investigation And Cleanup And Abatement Of Discharges Under Water Code Section 13304*, (As Amended on April 21, 1994 and October 2, 1996).

- Documentation of historical or current activities, waste characteristics, chemical use, storage or disposal information, as documented by public records, responses to questionnaires, or other sources of information;
- Site characteristics and location in relation to other potential sources of a discharge;
- Hydrologic and hydrogeologic information, such as the difference in upgradient and downgradient water quality;
- Industry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills, and clarifiers;
- Evidence of poor management of materials or wastes, such as improper storage practices or inability to reconcile inventories;
- Lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal;
- Physical evidence, such as analytical data, soil or pavement staining, distressed vegetation, or unusual odor or appearance;
- Reports and complaints;
- Other agencies' records of possible known discharge; and
- Refusal or failure to respond to San Diego Water Board inquiries.

1.3.3. State Water Resources Control Board Decisions Dealing with Responsible Parties

The State Water Board has also, in a series of orders dealing with the review of Regional Water Board decisions on who is responsible for cleanups, established the following general principles regarding responsible parties in cleanup and abatement orders:

- In general, name all persons who have caused or permitted a discharge (Orders Nos. WQ 85-7 and 86-16).
- "Discharge" is to be construed broadly to include both active discharges and continuing discharges (Order No. WQ 86-2).
- There must be reasonable basis for naming a responsible party ~~(i.e., substantial evidence)~~. It is inappropriate to name persons who are only remotely related to the problem such as suppliers and distributors of gasoline (Orders Nos. WQ 85-7, 86-16, 87-1, 89-13, and 90-2).

- Persons who are in current possession, ownership or control of the property should be named, including current landowners and lessees (numerous orders, including Orders Nos. WQ 84-6, 86-11, 86-18, 89-1, 89-8, 89-13 and 90-3). Lessee/sublessors may be responsible (WQ 86-15).

- Generally, ~~RWQCBs~~ Regional Water Boards should not try to apportion responsibility between parties (WQ 86-2 and 88-2).

- However, in some cases, current landowners should only be named as secondarily liable. Factors: Landowner did not cause or know of actual discharge; tenant, lessee or prior owner is responsible; cleanup is proceeding; and lease is long-term (Orders Nos. WQ 86-11, 86-18, 87-6, and 92-13). Secondary responsibility is also appropriate where landowner is trustee-type governmental agency such as Forest Service (Order No. WQ 87-5).

- Prior landowners and lessees should be named if they owned or were in possession of Shipyard Sediment Site at the time of discharge, had knowledge of the activities that resulted in the discharge, and had the legal ability to prevent the discharge (numerous orders, including Orders Nos. WQ 85-7, 86-15, 91-7 and 92-13). Narrow exceptions based on such factors as: site owned or leased for short time, person did not cause actual discharge, are other responsible parties, person did not use property, no or minimal knowledge of problem (Orders Nos. WQ 92-4 and 92-13).

- It is appropriate to name government agencies as responsible parties (Orders Nos. WQ 88-2, 89-12, and 90-3).

- Corporations should be named even where a dissolved corporation (Order No. WQ 89-14) or a successor in interest (Order No. WQ 89-8).

1.3.4. Responsible Parties Named as Dischargers

The San Diego Water Board applied the principles cited above in determining who should be named as a discharger in the Cleanup and Abatement Order. For the reasons set forth in Sections 2, 3, 4, 5, 6, 9, and 10 of this Technical Report the San Diego Water Board determined that NASSCO, BAE Systems, the City of San Diego, ~~Star & Crescent Boat Company~~San Diego Marine Construction Company, Campbell Industries, SDG&E, a subsidiary of Sempra Energy Company, the United States Navy, and the Port District have each caused or permitted the discharge of pollutants to the Shipyard Sediment Site resulting in the accumulation of pollutants in the marine sediment. Accordingly, with the exception of San Diego Marine Construction Company, for which no corporate successor has yet been determined, these parties are named as dischargers in the Cleanup and Abatement Order. ~~The Dischargers and the San Diego Water Board Cleanup Team acknowledge that the stipulated Tentative CAO must be adopted by the San Diego Water Board after due notice and opportunity for public comment before it becomes applicable. In the event, the San Diego Water Board proposes any changes to the Tentative CAO deemed material by the Dischargers, the Dischargers reserve their right to complete the administrative process delineated in the Final Discovery Plan and Second Amended Order of Proceedings, including the rights to conduct discovery, to cross-examine witnesses, and to~~

~~submit rebuttal evidence, comments and initial and firnal briefs, subject to revised deadlines to be set by the San Diego Water Board or its designated Presiding Officer.~~

1.3.5. Parties the San Diego Water Board Declined to Name as Dischargers

1.3.5.1. ChevronTexaco, BP and the Atlantic Richfield Company (ARCO)

The San Diego Water Board applied the principles cited above in determining that Chevron, a subsidiary of ChevronTexaco, BP and the Atlantic Richfield Company (ARCO) should not be named as dischargers in the Cleanup and Abatement Order. For the reasons set forth in Sections 7 and 8 of this Technical Report the San Diego Water Board determined that there is insufficient evidence to conclude that these parties contributed to the accumulation of pollutants in the marine sediment at the Shipyard Sediment Site to levels, which create, or threaten to create, conditions of pollution or nuisance.

1.3.5.2. Star & Crescent Boat Company (Star & Crescent)

The San Diego Water Board declines to resolve the factual and legal issues necessary to determine whether Star & Crescent is the corporate successor of and responsible for discharges of waste caused or permitted by San Diego Marine Construction Company. If the federal court determines that Star & Crescent is the corporate successor of San Diego Marine Construction Company, assuming its liabilities, the San Diego Water Board directs the San Diego Water Board Cleanup Team to reevaluate whether it is appropriate to add Star & Crescent as a discharger under this CAO. See discussion in Finding 5 of this CAO and the corresponding sections in this Technical Report.

1.4. Pollution and Contamination Conditions at the Shipyard Sediment Site

~~CWC~~ Water Code section 13304 requires a person to clean up waste or abate the effects of the waste if so ordered by a regional water board in the event there has been a discharge in violation of waste discharge requirements, or if a person has caused or permitted waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates or threatens to create a condition of pollution or nuisance. "Pollution" is defined as "an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects … the waters for beneficial uses.…"[10] "Contamination" is defined as "an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."[11]

Contaminated marine sediment at the Shipyard Sediment Site threatens San Diego Bay beneficial uses and creates a condition of pollution and contamination in waters of the State. The pollution and contamination conditions found at the Shipyard Sediment Site described in the subsections

[10] Water Code section 13050(1).

[11] Water Code section 13050(k).

below are the result of the discharge of waste by the responsible parties described in Section 1.3.4, above.

1.4.1. Overview of Potential Adverse Effects[12]

Bay bottom marine sediment provides habitat for many aquatic organisms and functions as an important component of aquatic ecosystems. Sediment also serves as a major repository for persistent and toxic chemical pollutants released into the environment. In the aquatic environment, chemical waste products of anthropogenic (human) origin that do not easily degrade can eventually accumulate in sediment. The environmental threat associated with elevated levels of pollutants in sediment is caused by the tendency of many chemical substances discharged into marine waters to attach to sediment particles and thus accumulate to high concentrations in the bay bottom sediment.

Adverse effects on organisms in or near sediment can occur even when pollutant levels in the overlying water are low. Benthic (bottom-dwelling) organisms can be exposed to pollutants in sediment through direct contact, ingestion of sediment particles, or uptake of dissolved contaminants present in the interstitial (pore) water. In addition, natural and human disturbances of the sediment can release pollutants to the overlying water, where pelagic (open-water) organisms can be exposed. Evidence from laboratory tests shows that contaminated sediment can cause both immediate lethality (acute toxicity) and long-term deleterious effects (chronic toxicity) to benthic organisms. Field studies have revealed other effects, such as tumors and other lesions, on bottom-feeding fish. These effects can reduce or eliminate species of recreational, commercial, or ecological importance (such as crabs, shrimp, and fish) in water bodies either directly or by affecting the food supply that sustainable populations require.

Furthermore, contaminated sediment can also lead to the accumulation of pollutants in organisms due to the effects of bioaccumulation. In addition, biomagnification of the contaminants can occur in the food chain when smaller contaminated organisms are consumed by higher trophic level species, including humans. Thus pollutants in the marine sediment might accumulate in edible tissue to levels that cause health risks to wildlife and human consumers.

In summary, contaminated marine sediments are a threat to water quality and beneficial uses for the following reasons:

- Various toxic contaminants found only in barely detectable amounts in the water column can accumulate in sediment to much higher levels over time.
- Sediment serves as both a reservoir for contaminants and a source of contaminants to the water column and organisms.
- Sediment contaminants (in addition to water column contaminants) directly affect benthic infauna and higher trophic level organisms (including humans) which contact these fauna through the food web.

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[12] Adapted from U.S. EPA. 1997d.

- Sediment is an integral part of the aquatic environment that provides habitat, feeding, spawning, and rearing areas for many aquatic organisms.

1.4.2. San Diego Bay Beneficial Uses

The Water Quality Control Plan for the San Diego Basin (Basin Plan) designates the following 12 beneficial uses for San Diego Bay that must be protected against water quality degradation. These beneficial uses are applicable to the Shipyard Sediment Site.[13] (RWQCB, 1994):

- **Estuarine Habitat (EST)** – Includes uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds);
- **Marine Habitat (MAR) -** Includes uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds);
- **Migration of Aquatic Organisms (MIGR)** – Includes uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish;
- **Wildlife Habitat (WILD)** – Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources;
- **Preservation of Biological Habitats of Special Significance (BIOL)** – Includes uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection;
- **Rare, Threatened, or Endangered Species (RARE)** – Includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered;
- **Contact Water Recreation (REC-1)** – Includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs;
- **Non-contact Water Recreation (REC-2)** – Includes the uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities;

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[13] Basin Plan (RWQCB, 1994), Table 2-3, Beneficial Uses of Coastal Waters at page 2-47.

- **Shellfish Harvesting (SHELL)** – Includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial, or sport purposes;

- **Commercial and Sport Fishing (COMM)** – Includes the uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes;

- **Navigation (NAV)** – Includes uses of water for shipping, travel, or other transportation by private, military, or commercial vessels; and

- **Industrial Service Supply (IND)** – Includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.

1.4.2.1. Adverse Effects to San Diego Bay Beneficial Uses

Contaminated marine sediment at the Shipyard Sediment Site threatens three target receptors: aquatic life, aquatic-dependent wildlife, and human health. San Diego Bay beneficial uses applicable to each of these target receptors are identified in Table 1-1. Actual or potential impairments to these target receptors are described in the following sections of this Technical Report:

- Aquatic life impairments are discussed in Sections 14 to 20.
- Aquatic dependent wildlife impairments are discussed in Sections 21 to 24.
- Human health impairments are discussed in Sections 25 to 28.

Table 1-1 Target Receptors Associated with San Diego Bay Beneficial Uses

TARGET RECEPTORS	AQUATIC LIFE	AQUATIC-DEPENDENT WILDLIFE	HUMAN HEALTH
BENEFICIAL USES	Estuarine Habitat (EST)	Wildlife Habitat (WILD)	Contact Water Recreation (REC-1)
	Marine Habitat (MAR)	Preservation of Biological Habitats of Special Significance (BIOL)	Non-Contact Water Recreation (REC-2)
	Migration of Aquatic Organisms (MIGR)	Rare, Threatened or Endangered Species (RARE)	Shellfish Harvesting (SHELL)
			Commercial and Sport Fishing (COMM)

Table 1-2 Overview of Potential Impacts to Aquatic Life, Aquatic Dependent Wildlife and Human Health.

Description of Adverse Effects Observed	Technical Report Section	Beneficial Uses Potentially Impacted
Aquatic Life Risks. Six of 30 stations sampled at the Shipyard Sediment Site are categorized as "Likely" impacted based on the results of the Triad lines of evidence. The chemicals of potential concern (CoPCs) present in the sediment, therefore, have the potential to adversely impact the organisms living in or on the sediment (i.e., benthic community).	18	MAR, MIGR
Bioaccumulation. For many chemical pollutants, concentrations in tissues of clams exposed in the laboratory to shipyard sediment samples increase as chemical pollutant concentrations in sediment increases. Indicates the likelihood of chemicals entering the aquatic food web.	19	MAR, MIGR, WILD, BIOL, RARE, SHELL, COMM
Aquatic-Dependent Wildlife Risks. Hazard quotients calculated at the Shipyard Sediment Site exceed 1.0 at the no-effect TRV exposure threshold for some receptors and chemicals, and are greater than the hazard quotients calculated at the reference area. Ingestion of prey items at the Shipyard Sediment Site, therefore, potentially poses a risk to wildlife receptors of concern.	24	MAR, WILD, RARE
Human Health Risks. Cancer risks calculated at the Shipyard Sediment Site for some chemicals exceed the target cancer risk level of $1x10^{-6}$ and are greater than the cancer risks calculated at the reference area. Ingestion of fish and shellfish caught at the Shipyard Sediment Site, therefore, potentially poses a cancer risk to recreational and subsistence anglers.	28	SHELL, COMM
Human Health Risks. Non-cancer risks calculated at the Shipyard Sediment Site for some chemicals exceed the target non-cancer risk level of 1.0 and are greater than the non-cancer risks calculated at the reference area. Ingestion of fish and shellfish caught at the Shipyard Sediment Site, therefore, potentially poses a non-cancer risk to recreational and subsistence anglers.	28	SHELL, COMM

1.4.2.2. Navigation (NAV) and the Industrial Service Supply (IND) Beneficial Uses

Contaminated marine sediment at the Shipyard Sediment Site may also threaten San Diego Bay Navigation (NAV) and the Industrial Service Supply (IND) beneficial uses if cleanup of the Shipyard Sediment Site does not occur. Shipping, travel, or transportation by private, military, or commercial vessels is an important beneficial use in San Diego Bay. The protection of this beneficial use is dependent upon maintaining appropriate depths in shipping channels and vessel berthing areas by carrying out maintenance dredging. The Navigation (NAV) beneficial use can be adversely affected when maintenance-dredging projects are stymied due to water quality problems associated with the resuspension and migration of pollutants from contaminated bay sediment to previously uncontaminated areas. The Navigation beneficial use can also be affected when pollutants in bay sediment complicate the disposal of dredged sediment by exceeding criteria for the ocean disposal of dredged sediment or the beneficial reuse of dredged sediment (e.g. beach replenishment) from maintenance dredging projects. The Industrial Service Supply (IND) beneficial use can be adversely affected by pollutants migrating from the sediment into the water column causing a decline in water quality conditions.

The Cleanup and Abatement Order does not specifically identify impairments to the Navigation (NAV) or the Industrial Service Supply (IND) beneficial uses. It is assumed that cleanup levels protective of the beneficial uses tabulated in Table 1-1 will also be protective of the Navigation (NAV) or the Industrial Service Supply (IND) beneficial uses.

1.4.3. San Diego Bay Water Quality Objectives

The Basin Plan sets narrative and numerical water quality objectives[14] that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy (RWQCB, 1994). The narrative water quality objective for toxicity[15] applicable to San Diego Bay and the Shipyard Sediment Site provides that:

> *"All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the [San Diego Water] Board."*

> *"The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with requirements specified in US EPA, State Water Resources Control Board or other protocol authorized by the [San Diego Water] Board. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour acute bioassay."*

> *"In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances will be encouraged."*

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14 "Water quality objectives" are defined in Water Code section 13050(h) as "the limits or levels water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area."

15 Basin Plan, Chapter 3. Water Quality Objectives, Page 3-15.

"Pollution" is defined under ~~CWC~~ Water Code section 13050(l), in part, to mean an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects beneficial uses. A condition of pollution exists when applicable water quality objectives are violated as a result of the discharge of waste.

The bioassay tests results show that the narrative toxicity objective was not attained at the Shipyard Sediment Site. A suite of three bioassay tests was conducted to test for toxicity of marine sediment. The majority of samples collected were significantly different than the negative (clean) control sample. Some of these same samples also exceeded the 95 percent prediction limit threshold value for that particular test. Processing the test responses in a toxicity decision matrix found 43 percent (13 out of 30 stations) to be moderately toxic and 57 percent to have low toxicity. Further details are provided in Section 18.

1.4.4. California Toxics Rule

U.S. EPA promulgated a final rule prescribing water quality criteria for toxic pollutants in inland surface waters, enclosed bays, and estuaries in California in 2000 (The California Toxics Rule or "CTR;").[16] CTR criteria constitute applicable water quality objectives in California. In addition to the CTR, certain criteria for toxic pollutants in the National Toxics Rule (NTR) [40 CFR 131.36] constitute applicable water quality objectives in California as well.

Comparisons were made to the CTR saltwater quality criterion continuous concentration (CCC), 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, 12 stations exceeded the copper CTR value, 6 stations exceeded the lead CTR value, and 12 stations exceeded the total PCBs CTR value. Although CTR values are derived based on toxicity to planktonic organisms, and the chemical sensitivities of planktonic and benthic organisms may differ, this comparison provides a screening-level evaluation of which chemicals may deserve further evaluation. Further details are provided in the Appendix for Section 15 (Pore Water Analyses).

1.5. Nuisance Conditions at the Shipyard Sediment Site

Deposits of pollutant waste in marine sediment at the Shipyard Sediment Site cause nuisance conditions because of the following:

There is an increased health risk to humans that consume fish and shellfish from San Diego Bay that bioaccumulate pollutants from the Shipyard Sediment Site;

There is a community of affected persons, including a considerable number of persons from minority populations, that consume fish and shellfish with a greater potential for adverse health effects; and

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[16] The California Toxics Rule (CTR) was finalized by the U.S. EPA in the Federal Register (65 Fed. Register 31682-31719), adding Section 131.38 to Title 40 of the Code of Federal Regulations on May 18, 2000. The full text of the CTR is available at the following web address: http://www.epa.gov/OST/standards/ctrindex.html.

There is obstruction to the public's free use of property.

1.5.1. Definition of Nuisance

~~CWC~~ Water Code section 13050 (m) cites three criteria, which determine whether nuisance conditions exist in waters of the state:

"*Nuisance" means anything that meets all of the following requirements:*

(1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.

(2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

(3) Occurs during, or as a result of, the treatment or disposal of wastes.

The pollution and contamination conditions found at the Shipyard Sediment Site meet all three criteria.

1.5.2. Increased Human Health Risk Associated with Consumption of San Diego Bay Fish

Fish consumption is the primary route of human exposure to the pollutants found at the Shipyard Sediment Site. Humans may eat fish that have bioaccumulated pollutants from the Shipyard Sediment Site. The San Diego Water Board evaluated potential impacts on human health by estimating potential carcinogenic risks and non-carcinogenic hazards associated with the consumption of Shipyard Sediment Site pollutants that bioaccumulate in fish tissue. The San Diego Water Board used U.S. EPA procedures for estimating human health risks due to the consumption of chemically contaminated fish tissue and employed appropriate human fish consumption rates and bioaccumulation factors in the analysis. The San Diego Water Board concludes in Section 28 of this Technical Report that human ingestion of seafood caught within all four assessment units at the Shipyard Sediment Site poses a cancer risk greater than 1×10^{-6} (i.e., 1 in 1,000,000 extra chance of cancer over a lifetime) and non-cancer risk greater than 1 to both recreational and subsistence anglers, given the assumptions of the exposure scenarios modeled. The San Diego Water Board also concludes the Shipyard Sediment Site poses a greater cancer and non-cancer risk to recreational and subsistence anglers than the risks posed at reference conditions in San Diego Bay. The carcinogenic chemicals of potential concern (CoPCs) include total polychlorinated biphenyls (PCBs) and inorganic arsenic. The non-carcinogenic CoPCs include cadmium, copper, mercury, and total PCBs. The calculations and results are provided in the Appendix for Section 28.

1.5.2.1. PCB Health Effects

U.S. EPA (2000b) has classified PCBs as "probable human carcinogens." Studies have suggested that PCBs may play a role in inducing breast cancer. Studies have also linked PCBs to increased risk for several other cancers including liver, biliary tract, gall bladder, gastrointestinal tract, pancreas, melanoma, and non-Hodgkin's lymphoma. PCBs may also cause non-carcinogenic effects, including reproductive effects and developmental effects (primarily to the nervous system). PCBs tend to accumulate in the human body in the liver, adipose tissue (fat), skin, and breast milk. PCBs have also been found in human plasma, follicular fluid, and sperm fluid. Fetuses may be exposed to PCBs in utero, and babies may be exposed to PCBs during breastfeeding. According to U.S. EPA (2000b), "[s]ome human studies have also suggested that PCB exposure may cause adverse effects in children and developing fetuses while other studies have not shown effects. Reported effects include lower IQ scores, low birth weight, and lower behavior assessment scores."

1.5.2.2. Inorganic Arsenic Health Effects

Arsenic is strongly associated with lung and skin cancer in humans, and may cause other internal cancers as well. Skin lesions, peripheral neuropathy, and liver and kidney disorders are commonly associated with chronic arsenic ingestion (U.S. EPA, 2000b).

1.5.2.3. Cadmium Health Effects

Kidney toxicity is the primary concern with cadmium exposure (U.S. EPA, 2000b). Chronic exposure to cadmium may also include anemia and bone disorders, including osteomalacia, osteoporosis, and spontaneous bone fractures. Some studies have suggested an association between neurotoxicity and cadmium exposure at levels below those that cause kidney toxicity. According to U.S. EPA (2000b), reproductive and developmental toxicity have been associated with cadmium ingestion.

1.5.2.4. Copper Health Effects

Although copper is an essential human nutrient, large intakes of copper can cause liver or kidney damage, or even death in cases of extreme exposure.

Short periods of exposure to levels above the U.S. EPA's Action Level of 1.3 parts per million can cause gastrointestinal disturbance, including nausea and vomiting. Use of water that exceeds this Action Level over many years could cause liver or kidney damage (U.S. EPA, 1995).

1.5.2.5. Mercury Health Effects

Methylmercury (CH_3Hg) is the form of mercury that builds up in the tissues of fish and is the most toxic. It affects the immune system, alters genetic and enzyme systems, and damages the nervous system, including coordination and the senses of touch, taste, and sight. Exposure to methylmercury is usually by ingestion, and it is absorbed more readily and excreted more slowly than other forms of mercury (U.S. Geological Survey, 2000).

Methylmercury readily crosses the placental and blood/brain barriers (U.S. EPA, 2000b) and is particularly damaging to developing embryos, which are five to ten times more sensitive than adults (U.S. Geological Survey, 2000). Studies found that offspring born of women exposed to methylmercury during pregnancy have exhibited a variety of developmental neurological abnormalities, including the following: delayed onset of walking, delayed onset of talking, cerebral palsy, altered muscle tone and deep tendon reflexes, and reduced neurological test scores (U.S. EPA, 1997e).

1.5.3. Adversely Affected Community from Consumption of San Diego Bay Fish

There are people in the local community that catch and consume fish and shellfish from San Diego Bay. The San Diego Bay Health Risk Study (County of San Diego, 1990), summarized in Section 1.5.3.2 below, reported that 74 percent of people who catch and consume fish from the Bay are people of color. The 1990 study reported that consumption patterns of ethnic populations indicate that they tend to eat more fish in their diet and eat parts of the fish that have higher pollutant accumulation. This group of anglers, including their family members that may also consume fish and shellfish caught in San Diego Bay, has a disproportionately higher health risk from pollution in the San Diego Bay than other San Diego Bay anglers.

1.5.3.1. Environmental Justice

Environmental justice is defined in California law[17] as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." The California Environmental Protection Agency (Cal EPA), and it's Boards, Departments, and Offices, which include the State and Regional Water Boards, are charged[18] with conducting its programs, policies, and activities in a manner that ensures the fair treatment of people of all races, cultures, and income levels, including minority populations and low-income populations of the state.

Cal EPA's stated mission, as described in its 2004 Intra-Agency Environmental Justice Strategy, is to accord the highest respect and value to every individual and community, by developing and conducting our public health and environmental protection programs, policies, and activities in a manner that promotes equity and affords fair treatment, accessibility, and protection for all Californians, regardless of race, age, culture, income, or geographic location. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

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[17] Government Code section 65040.12(e).

[18] Public Resources Code sections 71110 – 71113.

1.5.3.2. County of San Diego, 1990 San Diego Bay Health Risk Study

The County of San Diego's 1990 report, *San Diego Bay Health Risk Study*, identified the demographics and consumption patterns of people in the San Diego Region who catch and consume fish from San Diego Bay. Three hundred and sixty nine (369) anglers[19] were surveyed over a period of one year from October 1988 through October 1989. The survey was used to:

- Identify the species of fish most commonly caught by anglers of San Diego Bay;
- Identify the demographics of the population of anglers who catch fish; and
- Characterize the fish consumption ~~patters~~ patterns of the anglers and others who may consume fish.

The San Diego Bay angler interview locations selected by the California Department of Fish and Game (DFG) included Glorietta Bay, Coronado Ferry Landing, Shelter Island, Harbor Island, Spanish Landing, Embarcadero Park, Sweetwater Port District, the City of Chula Vista Bayside Park, and G Street Pier. Boat launches were also surveyed for anglers returning with their catch from the Bay.

The majority of anglers surveyed lived in municipalities adjacent to San Diego Bay. Table 1-3 provides a breakdown of the anglers' place of residence.

Table 1-3 Anglers' Reported Place of Residence

Residence	Percent of Total Anglers Interviewed1
City of San Diego	50.7%
City of Chula Vista	10.6 %
City of National City	8.1 %
San Diego County	15.9%
Outside San Diego County	3.5%
Undetermined	11.1%

1. County of San Diego (1990) Table IV-D, Demographic Profile of 369 Anglers.

Five distinct ethnic subpopulations were identified as constituting significant portions of the interviewed anglers: Caucasian, Filipino, Hispanic, Asian (Vietnamese, Laotian, Japanese, Cambodian, Chinese, Korean and Thai) and Black. Table 1-4 provides a comparison of fishing patterns for the ethnic populations surveyed.

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[19] An angler is a person who catches fish with a hook.

Table 1-4 Comparison of Fishing Patterns by Ethnicity

Ethnicity	Percent of Total Anglers[1]	Fishing Frequency (Times per Month)[2]	Percent of Anglers that Caught and Ate Fish	Average Yield (grams of fish /successful trip)[3]	Percent of Anglers who Fish Year Round
Caucasian	42.0	7.3	37.2	1,028	78.9
Filipino	20.1	7.1	73.6	2,156	60.9
Hispanic	12.5	4.5	40.0	969	52.6
Asian[4]	11.1	4.8	87.9	1,791	38.7
Black	6.5	3.9	38.9	1,896	79.2
Other Ethnic Groups[5]	2.2	7.3	50.0	767	62.5
Unidentified	5.6	NC	100.0	326	NC
Total Population	**100**	**6.4**	**53.4**	**1,504**	**67.8**

1. County of San Diego (1990) Table IV-D, Demographic Profile of 369 Anglers.
2. A 30-day month was assumed.
3. Based on interviews only where catch was consumed.
4. Group includes Vietnamese, Laotian, Japanese, Cambodian, Chinese, Korean, and Thai.
5. Group includes Indian, American, Indian, Hawaiian, and Polynesian.

NC = not calculated
(Table IV-E; County of San Diego, 1990)

County of San Diego (1990) drew the following conclusions from the data in Table 1-4:

- Caucasians and Filipinos were the most frequent anglers at 7.3 and 7.1 times per months respectively. Asians, Hispanics and Blacks were less frequent at 4.8, 4.5 and 3.9 times per month.

- Filipinos caught and consumed fish 73.6 percent of the time while Asians caught and consumed fish 87.9 percent of the time. Caucasians, Hispanics and Blacks all caught and consumed fish 40 percent or less of the time. This may indicate that Filipinos and Asians, more than other populations, are fishing in San Diego Bay for food rather than sport.

- In terms of average yield of fish in grams per successful trip (when fish were caught) Filipinos and Asians tended to be more successful than other portions of the population at 2,156 grams and 1,791 grams/successful trip respectively.

- In terms of the percentages of each population that fish year round, Blacks and Caucasians had the highest percentages at 79.2 % and 78.9 % respectively. Values for other populations ranged from a low of 38.7% for Asians to a high of 60.9% for Filipinos. These values are difficult to interpret because they do not contain any indication of what portion of the year was fished.

County of San Diego (1990) also evaluated patterns of consumption by ethnicity and the distribution of risk between ethnic groups. The results are summarized in Table 1-5, below.

Table 1-5 Comparison of Consumption Patterns By Ethnicity

Ethnicity	Percent of Total Consumers[1]	Percent of Total Measured Catch[2]	Projected Percent of Total Catch[2]	Consumption Rate (g/day)[3]
Caucasian	24	24.6	37.8	10.8
Filipino	32.6	39.0	28.7	49.5
Asian[4]	25.6	22.8	16.4	81.9
Hispanic	8.9	5.7	5.5	23.6
Black	4.7	6.5	9.7	NC[5]
Other Ethnic Groups[6]	2.2	1.4	1.9	NC[5]
Total	**100**	**100**	**100**	**31.2**

1. This distribution is based on a sample size of 143 interviews, representing 490.5 potential consumers.
2. These percentages represent only catch that was indicated would be consumed. These calculations assume that successful anglers not represented in the measured catch are catching fish at the same rate as those who are represented.
3. Consumption rates calculated using the following factors: fish weight, a cleaning factor, number of consumers, and fishing frequency.
4. Group includes Vietnamese, Laotian, Japanese, Cambodian, Korean, and Thai.
5. NC = not calculated. Sample sizes for these groups are insufficient to allow calculations of consumption rates.
6. Group includes Indian, American Indian, Hawaiian, Polynesian, and Unidentified.

(Table IV-F; County of San Diego, 1990)

County of San Diego (1990) drew the following conclusions from the data in Table 1-5 and other data contained in the report:

- Filipinos were determined to represent 32.6 percent of the total consumers in spite of the fact that they comprise only 20.1 percent of all anglers. Although Asians represent only 11.1 percent of the total anglers, 25.6 percent of the total consumers were Asian. Caucasians were determined to represent only 24 percent of the total consumers in spite of the fact that they comprise only 42 percent of all anglers. Hispanics and blacks made up only 8.9 percent and 4.7 percent of the totals consumers respectively.

- Caucasians were projected to consume 37.8 percent of the total consumed fish catch. Filipinos and Asians were projected to consume 28.7 percent and 16.4 percent of the total consumed fish catch respectively. Blacks and Hispanics were projected to consume the smallest portion of the total consumed fish catch at 9.7 percent and 5.5 percent respectively. While these estimates give some indication of the relative portion of total contaminated fish ingested by each group, it is important to note that other factors, such as the parts of a fish consumed may influence the actual amount of contaminants consumed.

- The fish consumption rate of 10.8 grams/day for Caucasians is considerably lower than the 31.2 grams/day determined for the entire population. The fish consumption rates for Filipinos, Asians and Hispanics were considerably higher than the Caucasian fish consumption rate. However limitations on population sample sizes especially for Hispanics and Asians, make comparisons of the consumption rates problematic.[20]

Individuals that consume a greater portion of the fish, such as internal organs may be at greater risk of consuming a greater amount of contaminants. Other data contained in Appendix J, Table J-10, Comparison of Parts Eaten By Ethnicity of County of San Diego (1990) indicates there were significant variations between ethnic populations in the parts of fish consumed. Only 5.6 percent of Caucasian anglers consumed the entire fish and 66.7 percent eat only the muscle. Approximately 40 percent of both Filipinos and Asians consume the entire fish. This means that on the average a given amount of fish consumed may result in a lower amount of ingested contaminants for Caucasians as compared to Filipinos and Asians.

1.5.3.3. Environmental ~~Heath~~ Health Coalition, Survey of Fishers on Piers in San Diego Bay

The Environmental Health Coalition (EHC)[21] conducted what they classified as an "opportunity" sample survey in 2004 of people fishing from piers near the Shipyard Sediment Site, NAVSTA San Diego and in the south end of San Diego Bay to ensure the interests of this population were considered in the Cleanup and Abatement Order decision-making process. The EHC described the survey group as a "…selective sample that is highly exposed to fish from near the shipyards, Naval Station San Diego, and the southern portion of San Diego Bay." The results of this survey are contained in a report titled, "*Survey of Fishers on Piers in San Diego Bay, Results and Conclusions*" (EHC, 2005), and are summarized below.

The EHC reported that a total of 109 fishers were interviewed in English, Spanish, or Tagalog, as appropriate, during the winter and spring of 2004. Piers surveyed by EHC included the following:

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[20] The fish consumption rates for Caucasians were estimated based on an interview sample size of 20 or more. The consumption rates for Asians and Hispanics were based on an interview sample size of 4 and 5 interviews respectively, and should only be considered an approximation of the actual consumption rates for those groups.

[21] The Environmental Health Coalition (EHC), is a self–described nonprofit environmental justice organization in San Diego dedicated to the prevention and cleanup of toxic pollution, monitoring actions causing pollution and educating communities about toxics.

Fishing Pier	Approximate Miles from Shipyard Sediment Site
Convention Center pier (downtown San Diego)	1.7
Pepper Park Pier (National City)	3.2
Chula Vista Pier	5.1

EHC (2005) reported the following:

- Of all of the fishers surveyed, the places of residence supplied by the interviewees were as follows:
    - Eighty three percent (83%) lived in EHC target communities such as the following:
        - National City (59%);
        - Barrio Logan (14%);
        - Western Chula Vista and Imperial Beach (10%); and
        - Seven percent (7%) lived in Tijuana, Mexico.
- Ninety-six percent of the fishers surveyed were people of color and consisted of the following ethnic groups:
    - Fifty seven percent (57%) Latino; and
    - Thirty nine percent (39%) Filipino.
- Of the surveyed fishers, the fishing patterns consisted of the following:
    - Fifty eight percent (58%) fished at least once a week; and
    - Twenty five percent (25%) fished daily.
- Almost two thirds (61%) of the fishers reported that they eat the fish they catch and two percent give the fish away.
- Of the surveyed fishers, 78 percent have children and 41 percent of those children eat fish caught from the Bay.
- Thirteen percent (13%) of the fishers surveyed reported eating fish skin, among them people who fish frequently and who catch large amounts of fish.
- Of the fishers surveyed, 73 percent eat other types of seafood in addition to what they catch.

The San Diego Water Board recognizes that there are limitations to the EHC Survey. The survey was not a representative sample of all San Diego Bay fishers or all South Bay residents. The survey assumed income based on place of residence and the appearance that someone appeared to be engaged in subsistence fishing.

1.5.4. Obstruction of Public's Free Use of Property

The ~~CWC~~ Water Code provides that all waters, surface and underground, are property of the people of the state.[22] The Legislature has also provided that the people of the state have a primary interest in the conservation of waters of the state and that the quality of all waters of the state shall be protected for the use and enjoyment of the people of the state.[23] Thus, impairment of water quality interferes with a right common to the general public. Waste discharges to the Shipyard Sediment Site have resulted in excessive levels of pollutants in the sediment that can in turn accumulate in edible tissue to levels that cause human health risks and present a threat to the public health. This condition adversely affects the Shellfish Harvesting (SHELL) and the Commercial and Sport Fishing (COMM) beneficial uses of San Diego Bay cited in Table 1-1 and also is a violation of the narrative water quality objective for toxicity applicable to San Diego Bay and cited in Section 1.4.3. This unreasonable impact on San Diego Bay beneficial uses and water quality presents an obstruction to the free use of property – property over which the state exercises governmental authority. On that basis, the San Diego Water Board concludes that the Dischargers have caused nuisance conditions in waters of the state, even without proof that the conditions are injurious to health or indecent or offensive to the senses.

San Diego Bay is bordered by the cities of San Diego, National City, Chula Vista and Coronado, with an estimated population of approximately 1.2 million persons. San Diego County has a population of over 2.4 million and is growing at a rate of about 50,000 per year. By the year 2010 there are predicted to be 3.5 million residents in the county, most of them in the metropolitan western portion.

San Diego Bay is an important and valuable resource to San Diego and the Southern California region. It provides habitat for fish and wildlife, extensive commercial and industrial economic benefits, and recreational opportunities to citizens and visitors. It is also a key element for the military security of the United States. The Bay is also a significant economic value to California and the Nation. It provides considerable shelter from ocean waves and is one of the finest natural harbors in the world. The Bay is a major tourist and convention destination, international shipping center, plays a key role in the national defense, and has many other recreational, industrial, and commercial uses. Most of these uses rely on a healthy Bay. Shipping, shipbuilding, boat repair, tourism, and other industries are either directly dependent on, or otherwise benefit from, the Bay. Because of its beauty and availability as a recreational resource, San Diego Bay is a major draw for the tourist industry. In 1997, tourism in the greater San Diego area accounted for 14 million overnight visitors and 4.4 billion dollars in income. Much of this activity occurred around San Diego Bay and downtown San Diego where the hotels and San Diego Convention Center are located.

San Diego Bay is designated as a State Estuary under Section 1, Division 18 (commencing with section 28000) of the Public Resources Code. A State Estuary is defined as a California saltwater bay or body of water, receiving freshwater stream flows, which supports human beneficial uses and wildlife and merits high priority action for preservation.

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[22] Wat. Code §§ ~~CWC sections~~ 102 and 104.

[23] Wat. Code §§~~CWC section~~ 13000.

1.5.5. Summary of Nuisance Condition

The waste at the Shipyard Sediment Site constitutes a public nuisance because it is injurious to human health and obstructs the free use of property and interferes with the comfortable enjoyment of life and property, and affects at the same time an entire community where the extent of the annoyance or damage inflicted upon individuals is unequal.

Human ingestion of seafood caught at the Shipyard Sediment Site poses an increased risk of cancer and toxicity to both recreational and subsistence anglers. This increased risk is based on total PCBs, inorganic arsenic, cadmium, copper, and mercury concentrations found in spotted sand bass and lobster tissue and whole body measurements. The *San Diego Bay Health Risk Study* (County of San Diego, 1990) reported PCBs and mercury in fish species caught by anglers in San Diego Bay.

The *San Diego Bay Health Risk Study* (County of San Diego, 1990) demonstrates that a considerable number of persons exists within the community surrounding San Diego Bay that consumes fish from the Bay that contain levels of contaminants, which are also found in sediment of the Shipyard Sediment Site, that have the potential to adversely ~~effect~~ affect their health. The survey by EHC (2005) supports the findings in the 1990 *San Diego Bay Health Risk Study* that a number of San Diego Bay anglers are people of color who fish frequently, consume their catch, and sometimes prepare the fish in ways that maximize exposure to contaminants.

Consistent with the Cal EPA's Environmental Justice Strategy, the San Diego Water Board must promote enforcement of the Clean Water Act (CWA) and CWC in a manner that ensures the fair treatment of people of all races, cultures, and income levels. A failure to act by the San Diego Water Board would violate principles of environmental justice because the health risk from regular consumption of fish caught in the San Diego Bay falls disproportionately on minority groups.

The consumption of fish and shellfish contaminated by pollutants from the Shipyard Sediment Site creates a threat to human health and an obstruction to the public's free use of San Diego Bay and its aquatic life resources thus interfering with the enjoyment of life and property.

2. Finding 2: National Steel and Shipbuilding Company (NASSCO), A Subsidiary of General Dynamics Company

Finding 2 of CAO No. ~~R9-2011-0001~~R9-2012-0024 states:

The San Diego Water Board ~~alleges, but NASSCO denies,~~ finds that NASSCO has caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. These wastes contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs), polynuclear aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons (TPH).

NASSCO, a subsidiary of General Dynamics Company, owns and operates a full service ship construction, modification, repair, and maintenance facility on 126 acres of tidelands property leased from the Port District on the eastern waterfront of central San Diego Bay at 2798 Harbor Drive in San Diego. Shipyard operations have been conducted at this site by NASSCO over San Diego Bay waters or very close to the waterfront since at least 1960. Shipyard facilities operated by NASSCO over the years at the Site have included concrete platens used for steel fabrication, a graving dock, shipbuilding ways, and berths on piers or land to accommodate the berthing of ships. An assortment of waste is generated at the facility including spent abrasive, paint, rust, petroleum products, marine growth, sanitary waste, and general refuse. Based on these considerations NASSCO is referred to as "Discharger(s)" in this Cleanup and Abatement Order (CAO).

2.1. Jurisdiction

~~CWC~~ Water Code section 13304 contains the cleanup and abatement authority of the San Diego Water Board. Section 13304(a) provides in relevant part that the San Diego Water Board may issue a cleanup and abatement order to any person "who has discharged or discharges waste into the waters of the state in violation of any waste discharge requirements … or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance…."

For the reasons set forth below, the San Diego Water Board has determined that the NASSCO, a subsidiary of General Dynamics Company, should be named as a discharger in Cleanup and Abatement Order No. R9-2010-0002 pursuant to ~~CWC~~ Water Code section 13304.

2.2. Admissible Evidence – State Water Resources Control Board Resolution No. 92-49

On June 18, 1992 (amended on April 21, 1994 and October 2, 1996) the State Water Board adopted Resolution No. 92-49, *Policies And Procedures For The Investigation And Cleanup And Abatement Of Discharges Under Water Code Section 13304.* Resolution No. 92-49 provides in part that:

I. The San Diego Water Board shall apply the following procedures in determining whether a person shall be required to investigate a discharge under CWC section 13267, or to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC section 13304. The San Diego Water Board shall:

A. Use any relevant evidence, whether direct or circumstantial, including, but not limited to, evidence in the following categories:

1. Documentation of historical or current activities, waste characteristics, chemical use, storage or disposal information, as documented by public records, responses to questionnaires, or other sources of information;

2. Site characteristics and location in relation to other potential sources of a discharge;

3. Hydrologic and hydrogeologic information, such as the difference in upgradient and downgradient water quality;

4. Industry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills, and clarifiers;

5. Evidence of poor management of materials or wastes, such as improper storage practices or inability to reconcile inventories;

6. Lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal;

7. Physical evidence, such as analytical data, soil or pavement staining, distressed vegetation, or unusual odor or appearance;

8. Reports and complaints;

9. Other agencies' records of possible known discharge; and

10. Refusal or failure to respond to San Diego Water Board inquiries.

2.3. NASSCO Owns and Operates a Full Service Ship Construction, Modification, Repair, and Maintenance Facility

2.3.1. Facility Description

From at least 1960 to the present, NASSCO owns and operates a full service ship construction, modification, repair, and maintenance facility on approximately 126 acres of tidelands property on the eastern waterfront of central San Diego Bay. The facility is located on land leased from the Port District at 28th Street and Harbor Drive in San Diego, California. NASSCO's primary business has historically been ship repair, construction, and maintenance for the U.S. Navy and commercial customers. The facility covers approximately 126 acres of tidelands on property leased from the Port District. The land portion and offshore area of the lease are comprised of approximately 80 acres and 46 acres, respectively. Current site improvements include offices, shops, warehouses, concrete platens for steel fabrication, a floating dry dock, a graving dock, two shipbuilding ways, and five piers, which provide 12 berthing spaces.

Shipbuilding and repair operations at NASSCO historically encompassed a large number and variety of activities and industrial processes including, but not limited to, formation and assembly of steel hulls; 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.

There are three major types of building/repair facilities at NASSCO, which, together with cranes, enable ships to be assembled, launched, or repaired. These facilities are a floating dry dock, a graving dock, and berths/piers. With the exception of berths and piers, the basic purpose of each facility is to separate a vessel from the bay to provide access to parts of the ship normally underwater. NASSCO currently has a floating dry dock, a graving dock, and five piers, which provide 12 berthing spaces and two (2) shipbuilding ways. The berths and piers are over-water structures where vessels are tied during repair or construction activities. Because dry dock space is limited and expensive, many operations are conducted pier side. For example, after painting the parts of a ship normally underwater, the ship is moved from the dry dock to a berth where the remainder of the painting is completed.

Prior to the early 1990's, when a storm water first-flush capture system was installed for portions of the facility, all surface water runoff from NASSCO discharged directly into San Diego Bay. Capture of first-flush storm water from high-risk areas (dry dock, graving dock, paint and blasting areas) was initiated by NASSCO in the early 1990s. Capture of first-flush storm water was extended to additional areas of the facility in 1997 (Exponent, 2003).

2.3.2. Activities Conducted by NASSCO

The primary activities at NASSCO involve a multitude of industrial processes, many of which are conducted over San Diego Bay waters or very close to the waterfront. As a result of these processes, an assortment of wastes is generated. The industrial processes at NASSCO include the following:

- **Surface Preparation and Paint Removal**. Methods of surface preparation and paint removal include dry abrasive blasting, wet abrasive or slurry blasting, hydroblasting, and chemical paint stripping;

- **Paint Application**. After preparation, surfaces are painted. Most painting occurs in a dry dock and involves the ship hull and internal tanks. Painting is also conducted in other locations throughout the shipyard including piers and berths. Paint application is accomplished by way of air or airless spraying equipment and is a major activity at NASSCO;

- **Tank Cleaning**. Tank cleaning operations use steam to remove dirt and sludge from internal tanks, particularly fuel tanks and bilges. Detergents, cleaners, and hot water may be injected into the steam supply hoses. NASSCO reports that wastewater generated has typically been removed and disposed of at an on-site treatment facility;

- **Mechanical Repair/Maintenance/Installation**. A variety of mechanical systems and machinery require repair, maintenance, and installation;

- **Structural Repair/Alteration/Assembly**. Structural repair, alteration, and assembly generally involve welding, cutting, and fastening of steel plates or assembly blocks and other industrial processes;

- **Integrity/Hydrostatic Testing**. Hydrostatic or strength testing and flushing are conducted on hulls, tanks, or pipe repairs. Integrity testing is also conducted on new systems during ship construction phases;

- **Paint Equipment Cleaning**. All air and airless paint spraying equipment is typically cleaned following use. Paint equipment cleaning is a major producer of waste, including solvents, thinners, paint wastes, and sludges;

- **Engine Repair/Maintenance/Installation**. Automotive repair, ship engine repair, maintenance, and installation generate waste oils, solvents, fuels, batteries, and filters;

- **Steel Fabrication and Machining**. Fabrication of engine and ship parts occurs at NASSCO. Cutting oils, fluids, and solvents are used extensively, including acetone, methyl ethyl ketone (MEK) and chlorinated solvents;

- **Electrical Repair/Maintenance/Installation**. The repair, maintenance, and installation of electrical systems involves the use of numerous hazardous materials including trichlorethylene, trichloroethane, methylene chloride, and acetone;

- **Hydraulic Repair/Maintenance/Installation**. The repair, maintenance, and installation of hydraulic systems involves the replacement of spent hydraulic oils;

- **Tank Emptying**. Bilge, fuel, and ballast tanks are typically emptied prior to ship repair activities;

- **Fueling**. Fueling operations occur at NASSCO;

- **Shipfitting**. Shipfitting is conducted at NASSCO, and is defined as the forming of ship plates and shapes, etc. according to plans, patterns, or molds;

- **Carpentry**. Woodworking, with associated wood dust production, is conducted at NASSCO; and

- **Refurbishing/Modernization/Cleaning**. Refurbishing, modernization, and cleaning of ships are conducted at NASSCO.

2.3.3. Materials Used at NASSCO

Materials commonly used at NASSCO are summarized below. Although a few specific materials are included, the list consists primarily of major categories.

- **Abrasive Grit**. Abrasive grit sometimes consists of slag collected from coal-fired boilers and contains iron, aluminum, silicon, and calcium oxides. Other metals, such as copper, zinc, and titanium are also sometimes present. Sand, cast iron, or steel shot are also used as abrasives. Enormous amounts of abrasive are needed to remove paint; removing paint from a 15,000 square foot hull can take up to 6 days and consume 87 tons of grit. Grit is needed in all dry and wet abrasive blasting.

- **Paint**. Paints contain copper, zinc, chromium, and lead as well as hydrocarbons. Two major types of paints used on ship hulls are:

  - Anticorrosive paints, vinyl, vinyl-lead, or epoxy-based coatings are used. Others contain zinc chromate and lead oxide; and

  - Antifouling paints are used to prevent growth and attachment of marine organisms by continuously releasing toxic substances into the water. Cuprous oxide and tributyltin fluoride or tributyltin oxide are the principal toxicants in copper-based and organotin-based paints, respectively.

- **Miscellaneous Materials**. Oils (engine, cutting, and hydraulic), lubricants, grease, fuels, weld, detergents, cleaners, rust inhibitors, paint thinners, hydrocarbon and chlorinated solvents, degreasers, acids, caustics, resins, adhesives/cement/sealants, and chlorine.

2.3.4. Wastes Generated by NASSCO

Categories of wastes commonly generated by NASSCO's industrial processes include, but are not limited to, those listed below.

- **Abrasive Blast Waste: Spent Grit, Spent Paint, Marine Organisms, and Rust**. Abrasive blast waste, consisting of spent grit, spent paint, marine organisms, and rust is generated in significant quantities during all dry or wet abrasive blasting procedures. The constituent of greatest concern with regard to toxicity is the spent paint, particularly the copper and tributyltin antifouling components, which are designed to be toxic and to continuously leach into the water. Other pollutants in paints include zinc, chromium, and lead. Abrasive blast waste can be conveyed by water flows, become airborne (especially during dry blasting), or fall directly into receiving waters. Based on available data for the years 1987 through 1991, NASSCO generates an average of 198 tons of abrasive blast waste per month.

- **Fresh Paint**. Losses occur when paint ends up somewhere other than its intended location (e.g., dry dock floor, bay, worker's clothing). These losses result from spills, drips, and overspray. Typical overspray losses are estimated at approximately 5 percent for air spraying; and 1 to 2 percent for airless spraying.

- **Bilge Waste/Other Oily Wastewater**. This waste is generated during tank emptying, leaks, and cleaning operations (bilge, ballast, fuel tanks, etc). In addition to petroleum products (fuel, oil), tank wash water also contains detergents or cleaners and is generated in large quantities.

- **Blast Wastewater**. Hydroblasting generates large quantities of wastewater. In addition to suspended and settleable solids (spent abrasive, paint, rust, marine organisms) and water, blast wastewater also contains rust inhibitors such as diammonium phosphate and sodium nitrite.

- **Oils (engine, cutting, and hydraulic)**. In addition to spent products, fresh oils, lubricants, and fuels are released as a result of spills and leaks from ship or dry dock equipment, machinery, and tanks (especially during cleaning and refueling).

- **Waste Paints/Sludges/Solvents/Thinners**. These wastes are generated from cleaning paint equipment.

- **Construction/Repair Wastes and Trash**. These wastes include scrap metal, welding rods, slag (from arc welding), wood, rags, plastics, cans, paper, bottles, packaging materials, etc.

- **Miscellaneous Wastes**. These wastes include lubricants, grease, fuels, sewage (black and gray water from vessels or docks), boiler blowdown, condensate, discard, acid wastes, caustic wastes, and aqueous wastes (with and without metals).

2.3.5. Abrasive Blast Waste and Other Waste Discharges - Sampling Results

During numerous inspections, San Diego Water Board inspectors observed abrasive blast waste and other wastes deposited in areas where it would probably be discharged into the waters of the state via storm water runoff (see Section 2.6 NASSCO Waste Discharges). Samples of abrasive blast waste and other wastes were collected in the vicinity of storm drains, or in other areas susceptible to being transported to San Diego Bay via storm water runoff, during inspections on August 3, 1989, August 14, 1989, October 16, 1991, and February 27, 1992.

2.3.5.1. May, June, and August 1989 Inspections and Sampling

The San Diego Water Board conducted a series of inspections during May, June, and August 1989. Abrasive blast waste was noted on Harbor Drive or other locations during inspections on May 31, June 29, August 1, August 2, August 3, August 7, August 8, and August 14, where it would probably be discharged into San Diego Bay via storm water runoff. The June 29, 1989 inspection report noted, "Sandblast waste was on the sidewalk at the same location noted during the NPDES inspection on 5-31-89." The San Diego Water Board Executive Officer sent a letter dated July 5, 1989, to NASSCO via certified mail requesting:

> "… immediate action to correct the deficiencies noted regarding: 1) sandblast and other waste discharges from the dry dock to San Diego Bay; 2) sandblast waste discharges to Harbor Drive; 3) failure to clean storm drain sumps; and 4) failure to properly certify monitoring reports."

During the August 1989 inspections, Samples LKM 890-52-A and LKM 890-37-A of the abrasive blast waste were collected and analyzed for metals. Sample LKM 890-52-A was collected from waste next to a sump near Building 6. The inspector reported that "… the sandblast pit is a major problem. Sandblast waste is everywhere w/o runoff controls" (RWQCB, 1989a). Sample LKM 890-37-A was collected from the blasting pit area. The analytical results are presented in Table 2-1, below.

2.3.5.2. October 16, 1991 Inspection and Sampling

During an inspection on October 16, 1991, the San Diego Water Board inspector noted violations of the NPDES permit and reported "a threaten[ed] discharge to the storm drains from blasting, painting and dust collection activities in the yard" (RWQCB, 1991). Abrasive blast waste was noted in the vicinity of storm drain inlets within the grit blast and painting area near the southeast corner of the NASSCO facility. Samples GRF 912-064A and GRF 912-064B were collected from gray and rust colored grit near the storm drain inlets at this location. The analytical results are shown in Table 2-1, below.

The San Diego Water Board inspector noted that two of the storm drains had valves that were shut and that another storm drain was covered with a steel plate with an opening in the middle. In a response letter dated December 18, 1991, NASSCO reported "a berm was installed around Storm Drain #3 in the grit blast and paint areas of the facility. A drain pipe was embedded though the berm, with a valve on the storm drain side to control discharges." However, in the same December 18, 1991 letter, NASSCO reported rainwater that backed up around the berm at

Storm Drain #3 "…was discovered missing." NASSCO indicated that they would take additional actions to avoid this happening in the future (Haumschilt, 1991).

In the primer line yard, sample GRF 912-064C was collected from smoke gray, powdery residue. The San Diego Water Board inspector noted that this area is open to potential contamination from the outside dust collection activity conducted at this location. The analytical results for sample GRF 912-064C are shown in Table 2-1, below.

2.3.5.3. February 27, 1992 Inspection and Sampling

During an inspection on February 27, 1992, the San Diego Water Board inspector noted spent abrasive blast waste on the surfaces of Storm Drain #2 and in the vicinity of Storm Drain #7. One sample (GRF 912-142) of sandy grit was collected near Storm Drain #7. In a response letter dated May 1, 1992, NASSCO indicated that they would initiate corrective actions in response to the findings of threatened discharges noted during the inspection (Snider, 1992).

Table 2-1 Abrasive Blast Waste Sampling Results

Chemical	LKM 890-52-A	LKM 890-37-A	GRF 912-064A	GRF 912-064B	GRF 912-064C	GRF 912-142	Background
Date	**8/3/89**	**8/14/89**	**10/16/91**	**10/16/91**	**10/16/91**	**2/27/92**	
Metals							
Arsenic (mg/kg)	136	57.8	< 24.1	60.2	< 22.6	< 210	7.5
Chromium (mg/kg)	93.5	31.9	1,520	147	547	1,870	57
Copper (mg/kg)	3,240(1)	1760	2,270	3,130(1)	388	955	121
Lead (mg/kg)	264	114	< 12	320	< 11.3	< 105	53
Mercury (μg/kg)	< 49	< 49	< 48	< 47	< 48	< 42	0.57
Nickel (mg/kg)	31.9	6.4	939	37.5	345	1,130	15
Silver (mg/kg)	4.76	1.96	5.01	1.09	2.03	< 16.8	1.1
Zinc (mg/kg)	1,240	268	19,800(1)	2,620	2,690	2,200	129

Note: The result exceeds criteria for characterization of hazardous waste per California Code of Regulations, Title 22, Chapter 11, section 66261.24. The total threshold limit concentration (TTLC) for copper is 2500 mg/kg and the TTLC for zinc is 5000 mg/kg. The TTLC represents the total concentration of a constituent that may be present before a waste is classified as a hazardous waste.

2.3.5.4. Discussion of Sampling Results

The inspections and analytical results indicate that abrasive blast wastes and other waste with elevated levels of metals were discharged or deposited where they were, or probably would have been, discharged into San Diego Bay and thereby creating, or threatening to create, a condition of pollution or nuisance. The analytical laboratory results for chromium, copper, nickel, and zinc for at least 5 of the 6 waste samples exceed the background sediment chemistry levels presented in Section 29 of this Technical Report.

In addition, two of the samples (LKM 890-52-A and GRF 912-064B) exceed the criteria for total concentration of copper that may be present before the waste is classified as hazardous waste due to toxicity, and one of the samples (GRF 912-064A) exceed the hazardous waste classification criteria for zinc (CCR Title 22). The waste would be classified as hazardous waste and proper disposal would be in a Class I Landfill licensed to receive hazardous waste.

2.4. NASSCO Discharged Waste to San Diego Bay Creating Pollution, Contamination, and Nuisance Conditions in San Diego Bay

NASSCO has discharged waste, or deposited waste where it was discharged, into San Diego Bay and created, or threatened to create, a condition of pollution, contamination, and nuisance. CWC section 13304 provides that a person who causes any waste to be discharged, or deposited where it probably will be discharged, into waters of the state creating, or threatening to create, a condition of pollution or nuisance is subject to cleaning up or abating the effects of the waste.

Pollutants generated at the NASSCO facility as a result of shipyard activities include metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PAHs, TPH, and probably PCBs, and PCTs. These same pollutants are present in the marine sediment adjacent to the NASSCO facility in highly elevated concentrations as compared to sediment chemistry levels found at off-site reference stations located in areas of San Diego Bay.[24]

The Shipyard Report (Exponent, 2003) provides the following findings about the distribution of elevated sediment chemical concentrations at the Shipyard Sediment Site:

- Elevated concentrations of metals are found near the municipal storm drain outfall in the BAE Systems leasehold and in the center of the NASSCO leasehold near the floating dry dock;

- Elevated concentrations of PCBs are found near the northern boundary of BAE Systems, at the storm drain outfall on BAE Systems' leasehold, and at the foot of Sicard Street near the common boundary between the two shipyards (BAE Systems and NASSCO);

- Petroleum hydrocarbons are distributed similarly to metals and PCBs, with an additional area of elevation near the southern boundary of NASSCO's leasehold; and

- Concentrations of all chemicals generally decrease with distance from shore.

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[24] "NASSCO's discharges of pollutants at the Shipyard Sediment Site have created or threaten to create a condition of nuisance in waters of the State. The discharges have caused or contributed to the accumulation of pollutants in the sediment in concentrations that are potentially injurious to the public health and affects a considerable number of persons as provided in Water Code section 13050(m)."

NASSCO has a history of discharging pollutants to San Diego Bay as a result of systemic problems and overall inadequacies in the implementation of its Best Management Practices Program to prevent such discharges. Some of NASSCO's discharges are presented in Sections 2.6, 2.7, 2.8 and 2.9 of this Technical Report. As described in Sections 13 through 28 of this Technical Report, these same pollutants in the discharges have accumulated in San Diego Bay sediment adjacent to the NASSCO facility in concentrations that may:

1. Adversely affect the beneficial uses of San Diego Bay as described in later sections of this Technical Report;

2. Cause pollution, contamination, or nuisance[25] conditions in San Diego Bay; and

3. Degrade marine communities, cause adverse effects on the environment or the public health, or result in harmful concentrations of pollutants in marine sediment.

The Porter-Cologne Water Quality Act defines "pollution" as "an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects … the waters for beneficial uses.…"[26] "Contamination" is defined as "an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."[27]

Accordingly, it is concluded that NASSCO has caused or permitted the discharge of waste to San Diego Bay in a manner causing the creation of pollution, contamination, and nuisance conditions and that it is appropriate for the San Diego Water Board to issue a cleanup and abatement order naming NASSCO as a discharger pursuant to CWC section 13304.

Further discussions on pollution, contamination, and nuisance are available in Sections 1.4 and 1.5 of this Technical Report.

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[25] NASSCO's discharges of pollutants at the Shipyard Sediment Site have created or threaten to create a condition of nuisance in waters of the State. The discharges have caused or contributed to the accumulation of pollutants in the sediment in concentrations that are potentially injurious to the public health and affects a considerable number of persons as provided in Water Code section 13050(m).

[26] Water Code section 13050(l).

[27] Water Code section 13050(k).

2.5. NPDES Requirement Regulation

Waste discharges from the NASSCO facility have historically been regulated under Waste Discharge Requirements (WDRs) prescribed by the San Diego Water Board pursuant to CWA section 402 and ~~CWC~~ Water Code section 13376. These requirements are referred to as either NPDES requirements[28] or by the federal terminology "NPDES Permit." NASSCO's first NPDES requirements started in 1974, when the San Diego Water Board issued WDRs to regulate specific shipyard activities (hereafter referred to as Shipyard NPDES Permit). A listing of the NPDES requirements adopted by the San Diego Water Board in effect at the time the facility was owned and operated by NASSCO is provided in Table 2-2 below.

Table 2-2 NASSCO NPDES Permits

Order Number / NPDES No.	Order Title	Adoption Date	Expiration Date
Order No. 74-79, Shipyard NPDES No. CA0107671	Waste Discharge Requirements For National Steel And Shipbuilding Company	November 4, 1974	October 29, 1979
Order No. 79-63, Shipyard NPDES No. CA0107671	Waste Discharge Requirements For The National Steel And Shipbuilding Company	October 29, 1979	June 10, 1985
Order No. 85-05, Shipyard NPDES No. CA0107697	Waste Discharge Requirements For National Steel And Shipbuilding Company San Diego County	June 10, 1985	October 15, 1997
Order No. 97-36, Shipyard NPDES No. CAG039001	Waste Discharge Requirements For Discharges From Ship Construction, Modification, Repair, And Maintenance Facilities And Activities Located In The San Diego Region (TTWQ/CPLX 1A)	October 15, 1997	February 5, 2003
Order No. R9-2003-0005, Shipyard NPDES No. CA0109134	Waste Discharge Requirements For National Steel And Shipbuilding Company San Diego County	February 5, 2003	September 1, 2009
Order No. R9-2009-0099, Shipyard NPDES No. CA0109134	Waste Discharge Requirements, General Dynamics, National Steel And Shipbuilding Company (NASSCO), Discharge To The San Diego Bay	August 12, 2009	Present

28 Pursuant to Chapter 5.5 of the Porter-Cologne Water Quality Act, to avoid the issuance by the United States Environmental Protection Agency of separate and duplicative NPDES permits for discharges in California that would be subject to the Clean Water Act, the State's Waste Discharge Requirements (WDRs) for such discharges implement the NPDES regulations and entail enforcement provisions that reflect the penalties imposed by the Clean Water Act for violation of NPDES permits issued by the U.S. EPA. Thus, the State's WDRs that implement federal NPDES regulations (NPDES requirements) serve in lieu of NPDES permits.

Pursuant to the NPDES requirements cited above, NASSCO was required to develop and implement "Best Management Practices"[29] (BMPs) plans to limit discharges of pollutants into San Diego Bay. As described in the current NPDES requirements, R9-2009-0099, BMPs may be "structural" (e.g., overhead coverage, retention ponds, control devices, secondary containment structures, and treatment) or "non-structural" (e.g., good housekeeping, preventive maintenance, material handling and storage, spill and leak response, onsite personnel training, waste handling/recycling, recordkeeping and internal reporting, erosion control and site stabilization, inspections, and quality assurance). Beginning in 1997 numerical effluent limitations for oil and grease, settleable solids, turbidity, pH, and temperature were established in the NPDES requirements for certain discharges (e.g. Non-Contact Cooling Water; Miscellaneous Low Volume Water, and Fire Protection Water).

In 1992, NASSCO obtained coverage under the State Water Board's 1991 General Industrial NPDES Requirements for storm water discharges. These NPDES requirements supplemented NASSCO's NPDES requirements listed in Table 2-2. The industrial storm water NPDES requirements applied specifically to discharges of pollutants through storm water, while the NPDES permits listed in Table 2-2 applied to other discharges. A listing of the General Industrial NPDES Requirements for storm water discharges adopted by the State Water Board in effect at the time the facility was owned and operated by NASSCO is provided in Table 2-3 below.

Table 2-3 NASSCO General Industrial NPDES Permits

Order Number / NPDES No.	Order Title	Adoption Date	Expiration Date
Order No. 91-13 DWQ, Industrial NPDES No. CAS000001	Waste Discharge Requirements (WDRs) For Discharge Of Storm Water Associated With Industrial Activities Excluding Construction Activities	(Notice of Intent Filed) November 4, 1992	(Notice of Intent Filed) February 5, 1998
Order No. 97-03 DWQ, Industrial NPDES No. CAS000001	Waste Discharge Requirements (WDRs) For Discharge Of Storm Water Associated With Industrial Activities Excluding Construction Activities	(Notice of Intent Filed) February 5, 1998	(Superseded by R9-2003-0005, Shipyard NPDES No. CA0109134) February 5, 2003

The General Industrial NPDES Requirements for storm water discharges required NASSCO to develop and implement plans to limit its discharges of pollutants from storm water runoff into San Diego Bay. Rather than relying on specific numerical effluent limitations, the NPDES requirements directed NASSCO to create and follow "Best Management Practices" (BMPs). The General Industrial NPDES Requirements for storm water discharges also required NASSCO to develop and implement a Storm Water Pollution Prevention Plan (SWPPP) and a Storm Water

[29] Best management practices ("BMPs") means schedules of activities, prohibitions of maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Pollution Monitoring Plan (SWPMP). The requirements specified that the SWPPP include, among other things, the following:

- Descriptions of sources that might add significant quantities of pollutants to storm water discharges;
- A detailed site map;
- Descriptions of materials that had been treated, stored, spilled, disposed of, or leaked into storm water discharges since November 1988;
- Descriptions of the management practices that were employed to minimize contact between storm water and pollutants from vehicles, equipment, and materials;
- Descriptions of existing structural and non-structural measures to reduce pollutants in storm water discharges;
- Descriptions of methods of on-site storage and disposal of significant materials;
- Descriptions of outdoor storage, manufacturing, and processing activities;
- A list of pollutants likely to be present in significant quantities in storm water discharges and an estimate of the annual amounts of those pollutants in storm water discharge;
- Records of significant leaks or spills of toxic or hazardous pollutants to storm water;
- Summary of existing data describing pollutants in storm water discharge;
- Descriptions of storm water management controls, including good housekeeping procedures, preventive maintenance, and measures to control and treat polluted storm water; and
- A list of the specific individuals responsible for developing and implementing the SWPPP.

The above requirements were incorporated into, and superseded by, Order No. R9-2003-0005, Shipyard NPDES No. CA0109134 upon adoption on February 5, 2003.

2.5.1. Order No. 74-79, Shipyard NPDES Permit No. CA0107671

Order No. 74-79, Shipyard NPDES Permit No. CA0107671, was in effect from November 4, 1974 to October 29, 1979, and contained the following key requirement that relates to the discussions contained herein:

- B. PROVISIONS … 1. Neither the treatment nor the discharge of pollutants shall create a pollution, contamination or nuisance as defined in the CWC.

2.5.2. Order No. 79-63, Shipyard NPDES Permit No. CA0107671

Order No. 79-63, Shipyard NPDES Permit No. CA0107671, in effect from October 29, 1979 to June 10, 1985, contained the following key requirement that relates to the discussions contained herein:

- B. PROVISIONS … 1. Neither the treatment nor the discharge of pollutants shall create a pollution, contamination or nuisance as defined in the CWC.

2.5.3. Order No. 85-05, Shipyard NPDES Permit No. CA0107671

Order No. 85-05, Shipyard NPDES Permit No. CA0107671, in effect from June 10, 1985 to October 15, 1997 contained the following key requirements that relate to the discussions contained herein:

- A. PROHIBITIONS … 2. The deposition or discharge of refuse, rubbish, materials of petroleum origin, spent abrasives (including old primer and antifouling paint), paint, paint chips, or marine fouling organisms into San Diego Bay or at any place where they would be eventually transported to San Diego Bay is prohibited;

- B. DISCHARGE SPECIFICATIONS … 2. Effluent discharged to San Diego Bay must be essentially free of: …(b) Settleable material or substances that form sediments which degrade benthic communities or other aquatic life. …(c) Substances toxic to marine life due to increases in concentrations in marine waters or sediments. …;

- B. DISCHARGE SPECIFICATIONS … 3. The discharger shall comply with the Water Pollution Control Plan described in Finding No. 7.

  Finding 7 states: The Water Pollution Control Plan details the following measures for controlling the pollutants identified in Finding 6: A. FLOATING DRY DOCK (1) During sandblasting and painting the dock basin will be under constant cleaning to remove sandblast grit and paint chips. Mechanical sweepers and skip loaders will be employed in the cleaning operations. (2) The dock will be encased in an oil boom during sandblasting and painting to contain overspray. (3) Prior to dry dock flooding, the entire dock floor will be swept broom-clean and all trash will be removed from the dock. (4) The wastewater from ship's bilge tanks will be pumped into vacuum trucks and transported to a disposal site approved by the San Diego Water Board Executive Officer. (5) All waste categories will be transferred to proper containers and disposed of at a dumpsite approved by the San Diego Water Board Executive Officer. B. SHIPBUILDING DRY DOCK (BUILDING POSITION NO. 1) AND SHIPBUILDING WAYS (BUILDING POSITIONS NOS. 2, 3, AND 4) (1) All dock basins will be subjected to the same sweep cleaning procedures as outline for the floating dry dock prior to flooding of the dock and during the sandblasting and painting operation. (2) All waste categories will be removed from drainage channels and sumps at least once a month. All controllable water sources shall be routed directly to the drainage channels by hose to avoid contact with any waste categories. C. OTHER FACILITIES (1) A floating catch barge will be used when sandblasting or paint chipping a ship over water. During this operation the barge will be rigged with burlap curtains to prevent the blast material from reaching the bay water. (2) Sanitary wastes will be discharged to the San Diego Metropolitan sewer system, except in the case of sanitary wastes collected in portable chemical toilets, which will be disposed of by an authorized waste hauler. (3) Open work areas will be routinely swept to maintain broom clean grounds. Mechanical sweepers will be available and several dumpsters will be placed at strategic locations around the NASSCO premises. (4) All storm drains shall be directed through screen baskets designed to entrap solid waste categories and prevent their discharge in the bay. These settling tanks shall be cleaned immediately following each rainfall. D. ACCIDENTAL SPILLS Accidental spills could result in the release of liquid pollutants such as fuel, oil, paints or sewage. The control and prevention of spills are generally covered in the NASSCO Spill Prevention and Contingency Plan dated March 1984. The plan outlines the procedures to be followed for the prevention, control, or cleanup of spills;

- C. RECEIVING WATER LIMITATIONS. NASSCO's discharge shall not cause violation of the following water quality objectives in San Diego Bay: … 5. Toxicity (a) All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. … ;

- D. PROVISIONS … 1. Neither the treatment nor the discharge of pollutants shall create a pollution, contamination, or nuisance as defined by section 13050 of the CWC; and

- D. PROVISIONS … 11. The discharger shall at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Order.

2.5.4. Order No. 97-36, Shipyard NPDES Permit No. CAG039001

Order No. 97-36, Shipyard NPDES Permit No. CAG039001, in effect from October 15, 1997 to February 5, 2003 contained the following key requirements that relate to the discussions contained herein:

- A. PROHIBITIONS … 2. The discharge of sewage (except as noted in the Basin Plan Waste Discharge Prohibitions) to San Diego Bay is prohibited;

- A. PROHIBITIONS … 5. The discharge of rubbish, refuse, debris, materials of petroleum origin (other than ship launch grease / wax) waste zinc plates, abrasives, primer, paint, paint chips, solvents, marine fouling organisms, and the deposition of such wastes at any place where they could eventually be discharged is prohibited. This pollution does not apply to the discharge of marine fouling organisms removed from unpainted, uncoated surfaces by underwater operations (see Prohibition 11). (Rubbish and refuse include any cans, bottles, paper, plastic, vegetable matter, or dead animals or dead fish deposited or caused to be deposited by man.);

- A. PROHIBITIONS … 8. Discharges of wastes and pollutants identified in Finding 2.a.i through 2.a.ix of this Order are prohibited. Discharges of wastes and pollutants not specifically identified in Finding 2.b through 2.e of this Order are prohibited.

  Finding 2 states the following: … a. Ship construction, modification, repair, and maintenance activities result or have the potential to result in discharges to San Diego Bay of wastes and pollutants which are likely to cause or threaten to cause pollution, contamination, or nuisance; adversely impact human health or the environment; cause or contribute to violation of an applicable water quality objective; and/or otherwise adversely affect the quality and/or beneficial uses of waters of the state and waters of the United States. Such discharges include: i. water contaminated with abrasive blast materials, paint, oils, fuels, lubricants, solvents, or petroleum; ii. hydroblast water; iii. tank cleaning water from tank cleaning to remove sludge and/or dirt; iv. clarified water from oil/water separation; v. steam cleaning water; vi. demineralizer / reverse osmosis brine; vii. floating dry dock sump water when the dry dock is in use as a work area or when the dry dock is not in use as a work area but before the sump has been purged following such use; viii. oily bilge water; ix. contaminated ballast water; and x. the first flush of storm water runoff from high-risk areas. … b. Ship construction, modification, repair, and maintenance activities also result or have the potential to result in discharges to San Diego Bay of wastes and pollutants which pose less threat than those identified in Finding 2.a above. Such discharge included: i. vessel wash down water; ii. floating dry dock submergence/emergence water; iii. graving dock flood water; iv. graving dock sump pump test water; v. shipbuilding ways flood water; vi. floating dry dock sump water when the dry dock is not in use as a work area after the sump has been purged following such use; vii. pipe and tank hydrostatic test water; viii. graving dock gate and wall leakage water; ix. shipbuilding ways gate and wall leakage and hydrostatic relief water; x. miscellaneous low-volume water; and xi. storm water runoff other than the first flush of storm water runoff from high-risk areas;

- B. DISCHARGE SPECIFICATIONS … 5. Waste discharges shall be essentially free of:

  a) Material that is floatable or will become floatable upon discharge;

  b) Settleable material or substances that may form sediments, which will degrade benthic communities or other aquatic life;

c) Substances, which will accumulate to toxic levels in marine waters, sediments, or biota;

d) Materials that result in aesthetically undesirable discoloration of receiving waters; and

e) Substances that significantly decrease the natural light to benthic communities and other marine life;

- C. RECEIVING WATER LIMITATIONS … Discharges shall not cause or contribute to violation of the following receiving water limitations:

1. There shall be no adverse impact on human health or the environment;

2. There shall be no impairment of any beneficial use or violations of the applicable Basin Plan Water Quality Objectives (Attachment C) or any applicable state Water Quality Control Plan or Policy;

3. Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded;

4. Natural light shall not be significantly reduced as the result of the discharge of waste;

5. The rate of deposition of inert solids and the characteristics of inert solids in sediments shall not be changed such that benthic communities are degraded;

6. The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions;

7. The concentration of substances in marine sediments shall not be increased to levels that would degrade indigenous biota;

8. The concentration of organic materials in sediment shall not be increased to levels that would degrade marine life;

9. Substances shall not be present in the water column, sediments, or biota at concentrations that adversely affect beneficial uses or which will bioaccumulate to levels that are harmful to aquatic organisms, wildlife, or human health; and

The daily maximum chronic toxicity of waters of the United States shall not exceed 1 Toxic Unit Chronic (TUc), as determined using a standard test species and protocol approved by the Executive Officer; and

- ATTACHMENT C. STANDARD PROVISIONS … 22. Pollution, Contamination, Nuisance: The handling, transport, treatment, or disposal of waste or the discharge of waste to waters of the state in a manner which causes or threatens to cause a condition of pollution, contamination, or nuisance, as those terms are defined in CWC 13050, is prohibited.

2.5.5. Order No. R9-2003-0005, Shipyard NPDES Permit No. CA0109134

Order No. R9-2003-0005, Shipyard NPDES Permit No. CA0109134, in effect from February 5, 2003 to Present, contains the following key requirements that relate to the discussions contained herein:

- A. PROHIBITIONS … 2. The discharge of sewage, except as noted in the Basin Plan Waste Discharge Prohibitions, to San Diego Bay is prohibited;

- A. PROHIBITIONS … 6. The discharge of rubbish, refuse, debris, materials of petroleum origin, waste zinc plates, abrasives, primer, paint, paint chips, solvents, and marine fouling organisms, and the deposition of such wastes at any place where they could eventually be discharged is prohibited. This prohibition does not apply to the discharge of marine fouling organisms removed from unpainted, uncoated surfaces by underwater operations and discharges that result from cleaning of floating booms that were installed for 'Force Protection' purposes (see Prohibition 10). (Rubbish and refuse include any cans, bottles, paper, plastic, vegetable matter, or dead animals deposited or caused to be deposited by man.);

- A. PROHIBITIONS … 8. The discharge or bypassing of untreated waste to San Diego Bay is prohibited. (This prohibition does not apply to non-contact cooling water, miscellaneous low volume water, and fire protection water streams, which comply with the requirements of this Order for elevated temperature waste discharges and which do not contain pollutants or waste other than heat.);

- B. DISCHARGE SPECIFICATIONS … 4. The following acute toxicity effluent limit applies to undiluted storm water discharges to San Diego Bay, that are associated with industrial activity: Acute toxicity: In a 96-hour static or continuous flow bioassay test, the discharge shall not produce less than 90 percent survival, 50 percent of the time, and not less than 70 percent survival, 10 percent of the time, using a standard test species and protocol approved by the San Diego Water Board;

- B. DISCHARGE SPECIFICATIONS … 9. Waste discharges shall be essentially free of:

  f) Material that is floatable or will become floatable upon discharge;

g) Settleable material or substances that may form sediments, which will degrade benthic communities or other aquatic life;

h) Substances, which will accumulate to toxic levels in marine waters, sediments, or biota;

i) Materials that result in aesthetically undesirable discoloration of receiving waters; and

j) Substances that significantly decrease the natural light to benthic communities and other marine life;

- C. RECEIVING WATER LIMITATIONS. Discharges shall not cause or contribute to violation of the following receiving water limitations:

  1. There shall be no adverse impact on human health or the environment;

  2. There shall be no impairment of any beneficial use or violations of the applicable Basin Plan Water Quality Objectives (Attachment C) or any applicable state Water Quality Control Plan or Policy;

  3. Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded;

  4. Natural light shall not be significantly reduced as the result of the discharge of waste;

  5. The rate of deposition of inert solids and the characteristics of inert solids in sediments shall not be changed such that benthic communities are degraded;

  6. The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions;

  7. The concentration of substances in marine sediments shall not be increased to levels that would degrade indigenous biota;

  8. The concentration of organic materials in sediment shall not be increased to levels that would degrade marine life; and

  9. Substances shall not be present in the water column, sediments, or biota at concentrations that adversely affect beneficial uses or which will bioaccumulate to levels that are harmful to aquatic organisms, wildlife, or human health.

- ATTACHMENT D, STANDARD PROVISIONS … 22. Pollution, Contamination, Nuisance: The handling, transport, treatment, or disposal of waste or the discharge of waste to waters of the state in a manner which causes or threatens to cause a condition of pollution, contamination, or nuisance, as those terms are defined in CWC 13050, is prohibited.

2.5.6. Order No. 91-13-DWQ, NPDES Permit No. CAS000001, General Industrial NPDES Requirements for Storm Water Discharges

Order No. 91-13-DWQ, NPDES Permit No. CAS000001, in effect from November 4, 1992 to February 5, 1998 contained the following key narrative limitations that relate to the discussions contained herein:

- A. DISCHARGE PROHIBITIONS: … 3. Storm water discharges shall not cause or threaten to cause pollution, contamination, or nuisance; and
- B. RECEIVING WATER LIMITATIONS. … 1. Storm water discharges to any surface or ground water shall not adversely impact human health or the environment.

2.6. NASSCO's Waste Discharges

NASSCO has discharged or deposited waste where it was discharged into San Diego Bay creating, or threatening to create, a condition of pollution or nuisance.

NASSCO Shipyard discharges are documented in the San Diego Water Board records via discharger monitoring and spill reports (filed by NASSCO), citizen complaints, San Diego Water Board inspection reports, and San Diego Water Board Notices of Violation issued to NASSCO. These discharges are itemized in Tables 2-4 through 2-8, below.

Table 2-4 NASSCO Discharges from 1974 to 1979

Date	Description	Technical Report Reference[1]	Source	Citation[2]
March 6, 1976	Discharge of approximately 200 gallons of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 74-79, B. Provisions 1
June 25, 1976	Discharge of approximately 500 gallons of oily water to Bay.	Section 2.4	NASSCO Spill Report	Order No. 74-79, B. Provisions 1
February 7, 1978	Discharge of trash to Bay.	Section 2.4	RWQCB Inspection	Order No. 74-79, B. Provisions 1

1. Reference to Section 2.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 2.4.
2. The cited waste discharge requirement(s) can be found in Section 2.5 of this Technical Report.

Table 2-5 NASSCO Discharges from 1979 to 1985

Date	Description	Technical Report Reference[1]	Source	Citation[2]
January 16, 1980	Discharge of abrasive blast waste to Bay.	Section 2.4	Citizen Complaint[3]	Order No. 79-63, B. Provisions 1
January 23, 1980	Discharge of abrasive blast waste to Bay.	Section 2.4	RWQCB Inspection	Order No. 79-63, B. Provisions 1
February 11, 1982	Discharge of abrasive blast waste to Bay.	Section 2.4	Citizen Complaint[3]	Order No. 79-63, B. Provisions 1

1. Reference to Section 2.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 2.4.
2. The cited waste discharge requirement(s) can be found in Section 2.5 of this Technical Report.
3. Anonymous citizen complaints constitute hearsay evidence and cannot alone support findings. However, the hearsay evidence is admissible to support findings of the San Diego Water Board if corroborated by other evidence.

Table 2-6 NASSCO Discharges from 1985 to 1998

Date	Description	Technical Report Reference[1]	Source	Citation[2]
June 15, 1987	Discharge of lead to Bay from sacrificial anode.	Section 2.4	Citizen Complaint[3]	Order No. 85-05, D. Provisions 1
June 25, 1987	Discharge of a large amount of paint to Bay.	Section 2.4	Citizen Complaint[3]	Order No. 85-05, A. Prohibitions 2
November 30, 1987	Discharge of abrasive blast waste to Bay.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
February 29, 1988	Discharge of abrasive blast waste to Bay.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
March 2, 1988	Discharge of abrasive blast waste to Bay.	Section 2.4	RWQCB Inspection; NASSCO Report[4]	Order No. 85-05, A. Prohibitions 2
February 27, 1989	Discharge of abrasive blast waste to Bay.	Section 2.4	RWQCB Inspection; NASSCO Report[4]	Order No. 85-05, A. Prohibitions 2
May 31, 1989	Discharge of abrasive blast waste to Bay.	Section 2.4	RWQCB Inspection; NASSCO Report[4]	Order No. 85-05, A. Prohibitions 2
June 29, 1989	Deposit of abrasive blast waste where it will probably be discharged to Bay.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
August 1, 1989	Deposit of abrasive blast waste where it will probably be discharged to Bay.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
August 2, 1989	Deposit of abrasive blast waste where it will probably be discharged to Bay.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2

Date	Description	Technical Report Reference[1]	Source	Citation[2]
August 3, 1989	Deposit of abrasive blast waste where it will probably be discharged to Bay. Sample results in Section 2.3.5.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
August 7, 1989	Deposit of abrasive blast waste where it will probably be discharged to Bay.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
August 8, 1989	Deposit of abrasive blast waste where it will probably be discharged to Bay.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
August 14, 1989	Deposit of abrasive blast waste where it will probably be discharged to Bay. Sample results in Section 2.3.5.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
June 20, 1990	Discharge of oil to Bay.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
June 20, 1990	Deposit of paint and debris in sump where it will probably be discharged to Bay.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
June 27, 1990	Discharge of 200 gallons of oily bilge wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
November 27, 1990	Deposit of abrasive blast waste and paint where it will probably be discharged to Bay.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
October 16, 1991	Deposit of abrasive blast waste and paint where it will probably be discharged to Bay. Sample results in Section 2.3.5.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
December 10, 1991	Discharge of 100 gallons of wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
February 27, 1992	Deposit of abrasive blast waste and paint where it will probably be discharged to Bay. Sample results in Section 2.3.5.	Section 2.4	RWQCB Inspection	Order No. 85-05, A. Prohibitions 2
April 22, 1992	Discharge of 30 gallons of waste oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
September 11, 1992	Discharge of approximately 10 gallons of waste (floor cement grindings) to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, D. Provisions 1
September 28, 1992	Discharge of approximately 25 gallons of wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, D. Provisions 1
September 29, 1992	Discharge of unknown quantity of shredded document slurry to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, D. Provisions 1

Date	Description	Technical Report Reference[1]	Source	Citation[2]
October 28, 1992	Discharge of 1,500 to 2,000 gallons of sewage wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, D. Provisions 1
December 19, 1992	Discharge of less than 1 gallon diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
January 25, 1993	Discharge of ½ gallon oily bilge water to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
February 1, 1993	Discharge of about 100 gallons of oily wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
February 2, 1993	Discharge of about 100 gallons of oil and water to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
February 11, 1993	Discharge of about 1,000 gallons raw sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, D. Provisions 1
March 22, 1993	Discharge of less than 250 pounds abrasive blast waste (copper slag blasting material) to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
March 31, 1993	Discharge of 8 - 10 gallons of bilge wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
April 30, 1993	Discharge of less than 1/2 gallon of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
September 8, 1993	Discharge of 10 gallons spent hydroblast waste to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
October 20, 1993	Discharge of 60 to 100 gallons of treated sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, D. Provisions 1
November 24, 1993	Discharge of 5 gallons of diesel oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
November 30, 1993	Discharge of less than 5 gallons of oily wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
December 14, 1993	Discharge of 5 gallons of bilge wastewater /petroleum to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
December 15, 1993	Discharge of between 250 and 400 gallons of diesel #2 fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
January 23, 1994	Discharge of approximately 2 gallons of gasoline to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
January 24, 1994	Discharge of 5 gallons of diesel oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
January 24, 1994	Discharge of 1-quart of lube oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
February 11, 1994	Discharge of 300 to 400 gallons of oily wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
February 22, 1994	Discharge of less than one pint of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2

Date	Description	Technical Report Reference[1]	Source	Citation[2]
June 10, 1994	Discharge of unknown quantity of oily bilge wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
November 7, 1994	Discharge of 2 to 5 gallons of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
December 5, 1994	Discharge of approximately 1 quart of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
January 12, 1995	Discharge of an estimated 150 gallons of NR 1 marine diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
April 8, 1995	Discharge of 15 gallons of diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
June 9, 1995	Discharge of various unpermitted discharges to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2 & D. Provisions 1
July 17, 1995	Discharge of 5 to 10 gallons of water and diesel oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
August 25, 1995	Discharge of 1 pint of diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
September 2, 1995	Discharge of an estimated 2 gallons of oily water to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
September 16, 1995	Discharge of an estimated 10 gallons of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
November 15, 1995	Discharge of 1 quart of transmission fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
November 20, 1995	Discharge of less than 1 pint of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
December 3, 1995	Discharge of 2 to 5 gallons of oil to Bay.	Section 2.4	US Navy Spill Report	Order No. 85-05, A. Prohibitions 2
January 17, 1996	Discharge of 1 to 2 gallons of T68 flushing oil to Bay.	Section 2.4	MSO San Diego Spill Report	Order No. 85-05, A. Prohibitions 2
February 5, 1996	Discharge of 1 pint of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
April 16, 1996	Discharge of 5 gallons of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
May 19, 1996	Discharge of less than 1 gallon of lube oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
June 13, 1996	Discharge of less than 5 gallons of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
July 20, 1996	Discharge of less than 1 pint of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
August 29, 1996	Discharge of 1 pint of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2

Date	Description	Technical Report Reference[1]	Source	Citation[2]
September 5, 1996	Discharge of 1 gallon of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
September 27, 1996	Discharge of less than 5 gallons of jet fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
September 30, 1996	Discharge of 1 gallon of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
October 3, 1996	Discharge of 1 pint of turpentine to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
December 2, 1996	Discharge of ½ to 1 gallon hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
January 14, 1997	Discharge of 1 pint of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
January 19, 1997	Discharge of less than 2 pounds copper slag to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
February 18, 1997	Discharge of 1 quart petroleum to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
April 5, 1997	Discharge of 10 to 15 gallons of red dye diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
May 19, 1997	Discharge of less than 1 quart of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
May 30, 1997	Discharge of less than 1 gallon of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
June 25, 1997	Discharge of unknown quantity of process wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, D. Provisions 1
September 17, 1997	Discharge of approximately 2 gallons of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
September 17, 1997	Discharge of less than one quart JP5 jet fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
September 29, 1997	Discharge of 20 gallons of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 85-05, A. Prohibitions 2
June 30, 1998	For failure to sufficiently clean Graving Dock before flooding, and failure to properly maintain and store equipment and failure to prevent deposition or discharge of refuse, rubbish, materials of petroleum origin, spent abrasives, paint, paint chips, or marine fouling organisms at a place where they could be transported to San Diego Bay and failure to give the San Diego Water Board notice of NASSCO's intent to flood the Dry Dock (i.e.	Section 2.4	RWQCB NOV Letter to NASSCO	Order No. 85-05, A. Prohibitions 2 & D. Provisions 11

Date	Description	Technical Report Reference[1]	Source	Citation[2]
	Graving Dock) at least 48 hours before beginning the flooding.			

1. Reference to Section 2.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 2.4.
2. The cited waste discharge requirement(s) can be found in Section 2.5 of this Technical Report.
3. Anonymous citizen complaints constitute hearsay evidence and cannot alone support findings. However, the hearsay evidence is admissible to support findings of the San Diego Water Board if other evidence can corroborate it.
4. NASSCO Letter Report dated March 7, 1989.

Table 2-7 NASSCO Discharges from 1997 to 2003

Date	Description	Technical Report Reference[1]	Source	Citation[2]
November 26, 1997	Discharge of between 1 pint and 1 quart of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
January 14, 1998	Discharge of less than 4 ounces of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
January 15, 1998	Discharge of 50 gallons of oily wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
January 22, 1998	Discharge of 1 pint of paint to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
February 3, 1998	Discharge of at less than 50 gallons of hydroblast water to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
February 9, 1998	Discharge of at least 2 gallons of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
March 17, 1998	Discharge of 2 gallons of oily water to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
April 1, 1998	Discharge of 1 to 2 gallons of diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
April 7, 1998	Discharge of about 1 gallon diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
April 21, 1998	Discharge of 175 gallons of 3% AFFF to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 8
April 27, 1998	Discharge of less than 1 pint of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
June 17, 1998	Deposit of oil drips, abrasive grit & other material where it could be discharged to Bay.	Section 2.4	RWQCB Inspection Report	Order No. 97-36, A. Prohibitions 5
January 8, 1999	Discharge of less than 1 gallon of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5

Date	Description	Technical Report Reference[1]	Source	Citation[2]
January 21, 1999	Discharge of less than 1/2 gallon of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
March 4, 1999	Discharge of between 1 pint and 1 quart of fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
June 16, 1999	Discharge of 20 to 30 gallons of sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2
July 13, 1999	Discharge of less than 50 gallons of sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2
August 19, 1999	Discharge of 10 gallons of cooking fat to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
August 27, 1999	Discharge of 1/2 pint of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
September 10, 1999	Discharge of 2 gallon of hydraulic fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
September 22, 1999	Discharge of an unknown quantity of dust particulate material to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 8
October 15, 1999	Discharge of 1/2 gallon of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
November 4, 1999	Discharge of less than 1 pint of paint to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
November 18, 1999	Discharge of less than 1 pint of paint to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
November 29, 1999	Discharge of less than 2 gallons of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
December 2, 1999	Discharge of 30 to 50 gallons of Turbine Lube Oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
December 17, 1999	Discharge of 1 pint of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
January 31, 2000	Discharge of 50 gallons of marine diesel oil discharged to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
February 18, 2000	Discharge of 50 gallons of sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2
March 27, 2000	Discharge of less than 1 gallon of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
June 6, 2000	Discharge of 1 to 2 gallons of oily wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
July 26, 2000	Discharge of several drops of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
August 4, 2000	Discharge of small amount of paint chips to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5

Date	Description	Technical Report Reference[1]	Source	Citation[2]
August 7, 2000	Discharge of less than 1 gallon of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
September 14, 2000	Discharge of 1 pint of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
November 7, 2000	Discharge of less than 1 gallon of diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
November 13, 2000	Discharge of less than 1 gallon of sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2
November 15, 2000	Discharge of 50 gallons of steam condensate to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 8
December 12, 2000	Discharge of ½ pint of yellow/green dye to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 8
December 20, 2000	Discharge of 200 gallons of sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2
January 2, 2001	Discharge of 2 gallons of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
January 3, 2001	Discharge of 1 quart of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
January 8, 2001	Discharge of ½ pint of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
January 12, 2001	Discharge of 30 gallons of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
February 24, 2001	Discharge of small quantity of paint dust to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
March 28, 2001	Discharge of less than 5 gallons of diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
May 14, 2001	Discharge of small quantity of wood dust to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 8
May 15, 2001	Discharge of less than 8 ounces of paint chips to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
May 17, 2001	Discharge of small quantity of copper slag dust to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
May 18, 2001	Discharge of unknown quantity of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
May 21, 2001	Discharge of less than 1 quart of oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
May 22, 2001	Discharge of less than 50 gallons of sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2
May 22, 2001	Discharge of small quantity of paint chips to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
May 24, 2001	Discharge of shop-vac contents to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 8

Date	Description	Technical Report Reference[1]	Source	Citation[2]
May 24, 2001	Discharge of small quantity of chalky substance to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 8
May 24, 2001	Discharge of small quantity of fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
May 25, 2001	Discharge of small quantity of diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
July 3, 2001	Discharge of less than 10 gallons of sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2
July 6, 2001	Discharge of 10 gallons of wastewater to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 8
August 18, 2001	Discharge of approximately 100 gallons of diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
November 7, 2001	Discharge of less than one gallon of paint to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
September 26, 2001	Discharge of less than 5 gallons of sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2
January 4, 2002	Discharge of approximately 1/2 gallon spent blast grit to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
February 13, 2002	Discharge of approximately ¼ cup of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
April 2, 2002	Discharge of approximately 25 gallons of oily water to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
April 6, 2002	Discharge of less than 5 gallons of sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2
May 31, 2002	Discharge of unknown quantity of paint overspray to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibition 5
July 2, 2002	Discharge of approximately 1 pint of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
August 5, 2002	Discharge of an estimated 3 gallons of oily water to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
August 13, 2002	Discharge of an estimated 120 gallons of diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
August 23, 2002	Discharge of an estimated 2 gallons of diesel fuel to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
September 6, 2002	Discharge of unspecified large quantity of AFFF to Bay.	Section 2.4	RWQCB Violation Letter	Order No. 97-36, A. Prohibitions 8
September 8, 2002	Discharge of an estimated 1/2 cup of lube oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
September 12, 2002	Discharge of less than 1 pint of lube oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 5
September 17, 2002	Discharge of less than 1,000 gallons of sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2

Date	Description	Technical Report Reference[1]	Source	Citation[2]
September 17, 2002	Discharge of estimated 75 gallons of AFFF discharged to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 8
December 6, 2002	Discharge of estimated less than 1 gallon of sewage to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2
January 7, 2003	Discharge of estimated 1 quart of sewage discharged to Bay.	Section 2.4	NASSCO Spill Report	Order No. 97-36, A. Prohibitions 2

1. Reference to Section 2.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 2.4.
2. The cited waste discharge requirement(s) can be found in Section 2.5 of this Technical Report.

Table 2-8 NASSCO Discharges from 2003 to 2005

Date	Description	Technical Report Reference[1]	Source	Citation[2]
February 10, 2003	Discharge of 500 gallons of raw sewage to Bay.	Section 2.4	RWQCB Enforcement Letter	Order No. R9-2003-0005, A. Prohibitions 2
February 24, 2003	Discharge of 3 gallons of hydraulic oil to Bay.	Section 2.4	NASSCO Spill Report	Order No. R9-2003-0005, A. Prohibitions 6
April 17, 2003	Discharge of 100 gallons of cleaning fluid to Bay.	Section 2.4	RWQCB Enforcement Letter	Order No. R9-2003-0005, A. Prohibitions 8
June 5, 2003	Discharge of approximately 10 gallons of hydroblast wastewater to Bay.	Section 2.4	RWQCB Enforcement Letter	Order No. R9-2003-0005, A. Prohibitions 6
June 6, 2003	Discharge of approximately 5 gallons of hydroblast wastewater to Bay.	Section 2.4	RWQCB Enforcement Letter	Order No. R9-2003-0005, A. Prohibitions 6
June 6, 2003	Discharge of approximately 2 gallons of hydroblast wastewater to Bay.	Section 2.4	RWQCB Enforcement Letter	Order No. R9-2003-0005, A. Prohibitions 6
June 12, 2003	Discharge of 5 gallons of hydroblast wastewater to Bay.	Section 2.4	RWQCB Enforcement Letter	Order No. R9-2003-0005, A. Prohibitions 6
June 12, 2003	Discharge of 25 gallons of sewage to Bay.	Section 2.4	RWQCB Enforcement Letter	Order No. R9-2003-0005, A. Prohibitions 2
June 23, 2003	Discharge of 50 gallons of sewage to Bay.	Section 2.4	RWQCB Enforcement Letter	Order No. R9-2003-0005, A. Prohibitions 2

Date	Description	Technical Report Reference[1]	Source	Citation[2]
June 30, 2003	Discharge of 1 cup of paint chips to Bay.	Section 2.4	RWQCB Enforcement Letter	Order No. R9-2003-0005, A. Prohibitions 6
August 15, 2003	Discharge of approximately ¼ cup of spray paint to Bay.	Section 2.4	NASSCO Spill Report	Order No. R9-2003-0005, A. Prohibitions 6
September 2, 2003	Discharge of less than 1 gallon of sewage discharged to Bay.	Section 2.4	RWQCB Enforcement Letter	Order No. R9-2003-0005, A. Prohibitions 2
October 24, 2003	Discharge of unknown quantity of substance causing oily sheen to Bay.	Section 2.4	RWQCB Enforcement Letter	Order No. R9-2003-0005, A. Prohibitions 6
December 2, 2003	Discharge of unknown quantity of paint chips to Bay.	Section 2.4	NASSCO Spill Report	Order No. R9-2003-0005, A. Prohibitions 6
November 29, 2004	Discharge of small amount of hydraulic fluid to Bay.	Section 2.4	NASSCO Spill Report	Order No. R9-2003-0005, A. Prohibitions 6
January 20, 2005	Violations of storm water toxicity effluent limitations on February 22, 2004 and February 26, 2004.	Section 2.4	RWQCB Notice of Violation	Order No. R9-2003-0005, B. Discharge Specifications 4

1. Reference to Section 2.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 2.4.
2. The cited waste discharge requirement(s) can be found in Section 2.5 of this Technical Report.

2.7. NASSCO's Storm Water Monitoring for Shipyard NPDES Requirements

Since 1985, NASSCO's Shipyard NPDES Permits have included Discharge Specifications and Receiving Water Limitations, which established a narrative limit on discharge pollutant concentrations to reduce or eliminate toxic chemical concentrations in marine water, marine life, and sediment.

While operating under various Shipyard NPDES Permits, NASSCO discharged constituents at levels that are elevated compared to levels established by the California Toxics Rule (CTR) for saltwater.[30] The U.S. EPA finalized the CTR on May 18, 2000. None of the numerical values in CTR were included as numerical effluent limitations in any of the Shipyard NPDES Permits issued to NASSCO. However, the numerical values in CTR represent the latest, most up-to-date numerical thresholds for use in determining whether a chemical concentration in a water body is

[30] The California Toxics Rule (CTR) was finalized by the U.S. EPA in the Federal Register (65 Fed. Register 31682-31719), adding Section 131.38 to Title 40 of the Code of Federal Regulations on May 18, 2000. The full text of the CTR is available at the following web address: http://www.epa.gov/OST/standards/ctrindex.html.

detrimental to its beneficial uses. By comparing CTR values with pollutant levels in historical discharges, the San Diego Water Board is able to determine which discharges *may* have contributed to toxic chemical concentrations in marine water, marine life, and sediment at the Shipyard Sediment Site in the past. Also, where there are historical discharges elevated above CTR values, there exists an *elevated probability* that those same discharges contributed to the present condition of pollution. In retrospect, to the extent that those historical, elevated discharges *did* cause toxic chemical concentrations in marine water, marine life, and sediment, and/or *did* contribute to the present condition of pollution at the Shipyard Sediment Site, there exists a Shipyard NPDES violation.

While NASSCO's various Shipyard NPDES Requirements[31] did not provide specific numerical limitations for all possible chemicals, the San Diego Water Board did require that discharges from NASSCO not cause a violation of the key requirements, described in Section 2.5, above. Monitoring reports submitted by NASSCO during the years 1991 and 2002 through 2004 indicate that elevated levels of copper, nickel, and zinc were present in storm water discharged from the NASSCO site. Specific discharges are presented in Tables 2-9 through 2-11, below.

Table 2-9 Discharge Sample Results Above CTR Criteria Occurring from 1985 to 1997

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
December 10, 1991	Zinc	6.2 mg/L	0.081 mg/L	Section 2.4	Storm Water Connection	Lab Report of NASSCO Sample	Order No. 85-05, B. Discharge Specifications 2b and 2c, and C. Receiving Water Limitations 5a

1. 40 CFR 131.38
2. Reference to Section 2.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 2.4.
3. The cited waste discharge requirement(s) can be found in Section 2.5 of this Technical Report.

31 Order No. 85-05, Shipyard NPDES Permit No. CA0107671, Order No. 97-36, Shipyard NPDES Permit No. CAG039001, and Order No. R9-2003-0005, Shipyard NPDES Permit No. CA0109134

Table 2-10 Discharge Sample Results Above CTR Criteria Occurring from 1997 to 2003

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
September 11, 2002	Copper	0.0208 mg/L	0.0031 mg/L	Section 2.4	Storm Water Ship Bldg Ways 4 Hydro-static relief	NASSCO Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10
September 11, 2002	Zinc	0.0841 mg/L	0.081 mg/L	Section 2.4	Storm Water Ship Bldg Ways Hydro-static relief	NASSCO Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10

1. 40 CFR 131.38
2. Reference to Section 2.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 2.4.
3. The cited waste discharge requirement(s) can be found in Section 2.5 of this Technical Report.

Table 2-11 Discharge Sample Results Above CTR Criteria Occurring from 2003 to 2004

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 26, 2003	Copper	0.00534 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
February 26, 2003	Copper	0.00351 mg/L	0.0031 mg/L	Section 2.4	Storm Water Graving Dock HR	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
February 26, 2003	Zinc	0.362 mg/L	0.081 mg/L	Section 2.4	Storm Water Graving Dock HR	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
February 26, 2003	Copper	0.01725 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
February 26, 2003	Copper	0.0459 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
February 26, 2003	Zinc	0.331 mg/L	0.081 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 21, 2003	Copper	0.00613 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 21, 2003	Copper	0.00381 mg/L	0.0031 mg/L	Section 2.4	Storm Water Graving Dock HR	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 21, 2003	Zinc	0.27 mg/L	0.081 mg/L	Section 2.4	Storm Water Graving Dock HR	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 21, 2003	Copper	0.0146 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 21, 2003	Zinc	0.127 mg/L	0.081 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 23, 2003	Copper	0.00938 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 23, 2003	Copper	0.0131 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 23, 2003	Zinc	0.153 mg/L	0.081 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 23, 2003	Copper	0.00371 mg/L	0.0031 mg/L	Section 2.4	Storm Water Graving Dock	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 23, 2003	Zinc	0.225 mg/L	0.081 mg/L	Section 2.4	Storm Water Graving Dock	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
April 23, 2003	Copper	0.00726 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 21, 2003	Copper	0.00975 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 21, 2003	Nickel	0.011 mg/L	0.0082 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 21, 2003	Copper	0.00432 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 21, 2003	Copper	0.006205 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
June 13, 2003	Copper	0.0067 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
June 13, 2003	Copper	0.00726 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
June 13, 2003	Copper	0.0045 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
August 6, 2003	Copper	0.00468 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
August 6, 2003	Copper	0.0046 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3 HR	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
August 6, 2003	Copper	0.00478 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4 HR	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
October 9, 2003	Copper	0.005 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
October 9, 2003	Copper	0.0503 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
October 9, 2003	Nickel	0.00861 mg/L	0.0082 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
October 9, 2003	Zinc	0.126 mg/L	0.081 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
October 9, 2003	Copper	0.00557 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 25, 2003	Copper	0.0068 mg/L	0.0031 mg/L	Section 2.4	Storm Water Graving Dock HR	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
November 25, 2003	Copper	0.00759 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
November 25, 2003	Copper	0.0168 mg/L	0.0031 mg/L	Section 2.4	Storm Water Graving Dock	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
November 25, 2003	Nickel	0.0187 mg/L	0.0082 mg/L	Section 2.4	Storm Water Graving Dock Flood Water	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
December 12, 2003	Copper	0.00405 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
December 12, 2003	Copper	0.00541 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
December 12, 2003	Copper	0.0037 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
January 7, 2004	Copper	0.00603 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
January 7, 2004	Copper	0.00623 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
January 7, 2004	Copper	0.00522 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
February 4, 2004	Copper	0.0305 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
February 4, 2004	Copper	0.00597 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 17, 2004	Copper	0.00837 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 17, 2004	Copper	0.00379 mg/L	0.0031 mg/L	Section 2.4	Storm Water Graving Dock	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 17, 2004	Nickel	0.00923 mg/L	0.0082 mg/L	Section 2.4	Storm Water Graving Dock	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 17, 2004	Copper	0.00494 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 17, 2004	Copper	0.00552 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 21, 2004	Copper	0.00313 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 21, 2004	Copper	0.0225 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 21, 2004	Zinc	0.237 mg/L	0.081 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 21, 2004	Copper	0.00317 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 17, 2004	Copper	0.0063 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 17, 2004	Nickel	0.00962 mg/L	0.0082 mg/L	Section 2.4	Storm Water Graving Dock	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 17, 2004	Copper	0.00664 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
May 17, 2004	Nickel	0.0107 mg/L	0.0082 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 17, 2004	Copper	0.0155 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
June 9, 2004	Copper	0.00767 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
June 9, 2004	Copper	0.00793 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
July 12, 2004	Copper	0.00468 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
July 12, 2004	Copper	0.00781 mg/L	0.0031 mg/L	Section 2.4	Storm Water Graving Dock	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
July 12, 2004	Copper	0.00674 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
July 12, 2004	Copper	0.0037 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
August 23, 2004	Copper	0.00383 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
August 23, 2004	Copper	0.00743 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
August 23, 2004	Copper	0.00321 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
September 13, 2004	Copper	0.00392 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
September 13, 2004	Copper	0.00733 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
October 13, 2004	Copper	0.00483 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
October 13, 2004	Copper	0.00319 mg/L	0.0031 mg/L	Section 2.4	Storm Water Graving Dock	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
October 13, 2004	Copper	0.00642 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November, 12, 2004	Copper	0.00415 mg/L	0.0031 mg/L	Section 2.4	Storm Water Fire Protection	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
November, 12, 2004	Copper	0.00318 mg/L	0.0031 mg/L	Section 2.4	Storm Water Graving Dock	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
November, 12, 2004	Copper	0.0068 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 3	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
November, 12, 2004	Copper	0.00457 mg/L	0.0031 mg/L	Section 2.4	Storm Water Shipbuilding Ways 4	NASSCO Monitoring Report	Order No. R9-2003-0005, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

1. 40 CFR 131.38
2. Reference to Section 2.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 2.4.
3. The cited waste discharge requirement(s) can be found in Section 2.5 of this Technical Report.

2.8. NASSCO's Storm Water Monitoring for the General Industrial NPDES Requirements for Storm Water Discharges

From 1992 until 2003, NASSCO's General Industrial NPDES Requirements for Storm Water Discharges included Discharge Prohibitions and Receiving Water Limitations, which set a narrative limit on discharge pollutant concentrations to reduce or eliminate toxic chemical concentrations in marine water, marine life, and sediment.

While subject to regulation under the General Industrial NPDES Requirements for Storm Water Discharges, NASSCO discharged pollutants at elevated levels compared to levels established by the CTR for saltwater.[32] The U.S. EPA finalized the CTR on May 18, 2000. None of the numerical values in CTR were included as numerical effluent limitations in any of the Industrial NPDES Requirements issued to NASSCO. However, the numerical values in the CTR represent

[32] The California Toxics Rule (CTR) was finalized by the U.S. EPA in the Federal Register (65 Fed. Register 31682-31719), adding Section 131.38 to Title 40 of the Code of Federal Regulations on May 18, 2000. The full text of the CTR is available at the following web address: http://www.epa.gov/OST/standards/ctrindex.html.

the latest, most up-to-date numerical thresholds for use in determining whether a chemical concentration in a water body is detrimental to its beneficial uses. By comparing CTR values with pollutant levels in historical discharges, the San Diego Water Board is able to determine which discharges *may* have contributed to toxic chemical concentrations in marine water, marine life, and sediment at the Shipyard Sediment Site in the past. Also, where there are historical discharges elevated above CTR values, there exists an *elevated probability* that those same discharges contributed to the present condition of pollution. To the extent that those historical, elevated discharges *did* cause toxic chemical concentrations in marine water, marine life, and sediment, and/or *did* contribute to the present condition of pollution at the Shipyard Sediment Site, such discharges may have constituted an Industrial NPDES Requirements violation.

While NASSCO's Industrial NPDES Requirements did not provide specific numerical limitations for all possible chemicals, the San Diego Water Board did require that discharges from NASSCO not cause a violation of discharge prohibitions and receiving water limitations described in Section 2.5.6, above. Monitoring reports submitted by NASSCO during the years 1992 through 1998, pursuant to the General Industrial NPDES Requirements for storm water discharges, indicate that elevated levels of chromium, copper, lead, nickel, and zinc have been present in storm water discharged from the NASSCO site when compared to levels established by the CTR for saltwater. The specific discharges above the CTR are cited in Table 2-12, below.

Table 2-12 Discharges Above CTR Value Occurring from 1992 to 1998

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 18, 1993	Chromium	0.11 mg/L	0.05 mg/L	Section 2.4	SW-5	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Chromium	0.22 mg/L	0.05 mg/L	Section 2.4	SW-7	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Copper	0.40 mg/L	0.0031 mg/L	Section 2.4	SW-1	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Copper	0.06 mg/L	0.0031 mg/L	Section 2.4	SW-2	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Copper	0.37 mg/L	0.0031 mg/L	Section 2.4	SW-3	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 18, 1993	Copper	0.43 mg/L	0.0031 mg/L	Section 2.4	SW-4	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Copper	0.43 mg/L	0.0031 mg/L	Section 2.4	SW-5	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Copper	0.31 mg/L	0.0031 mg/L	Section 2.4	SW-6	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Copper	2.2 mg/L	0.0031 mg/L	Section 2.4	SW-7	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Copper	0.37 mg/L	0.0031 mg/L	Section 2.4	SW-8	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Lead	0.11 mg/L	0.0081 mg/L	Section 2.4	SW-3	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Lead	0.07 mg/L	0.0081 mg/L	Section 2.4	SW-4	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Lead	0.06 mg/L	0.0081 mg/L	Section 2.4	SW-5	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Lead	0.05 mg/L	0.0081 mg/L	Section 2.4	SW-6	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Lead	1.0 mg/L	0.0081 mg/L	Section 2.4	SW-7	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 18, 1993	Nickel	0.19 mg/L	0.0082 mg/L	Section 2.4	SW-4	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Nickel	0.15 mg/L	0.0082 mg/L	Section 2.4	SW-7	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Zinc	2.4 mg/L	0.081 mg/L	Section 2.4	SW-1	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Zinc	1.0 mg/L	0.081 mg/L	Section 2.4	SW-2	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Zinc	2.7 mg/L	0.081 mg/L	Section 2.4	SW-3	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Zinc	4.0 mg/L	0.081 mg/L	Section 2.4	SW-4	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Zinc	5.4 mg/L	0.081 mg/L	Section 2.4	SW-5	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Zinc	5.2 mg/L	0.081 mg/L	Section 2.4	SW-6	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Zinc	10.6 mg/L	0.081 mg/L	Section 2.4	SW-7	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 18, 1993	Zinc	4.0 mg/L	0.081 mg/L	Section 2.4	SW-8	NASSCO 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 17, 1994	Chromium	0.1 mg/L	0.05 mg/L	Section 2.4	SW-5	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Chromium	0.2 mg/L	0.05 mg/L	Section 2.4	SW-7	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	0.09 mg/L	0.0031 mg/L	Section 2.4	SW-2	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	0.47 mg/L	0.0031 mg/L	Section 2.4	SW-3	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	6.1 mg/L	0.0031 mg/L	Section 2.4	SW-5	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	1.6 mg/L	0.0031 mg/L	Section 2.4	SW-6	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	1.6 mg/L	0.0031 mg/L	Section 2.4	SW-7	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	0.16 mg/L	0.0031 mg/L	Section 2.4	SW-8	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Lead	0.77 mg/L	0.0081 mg/L	Section 2.4	SW-7	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Nickel	20.0 mg/L	0.0082 mg/L	Section 2.4	SW-5	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 17, 1994	Nickel	0.3 mg/L	0.0082 mg/L	Section 2.4	SW-6	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Nickel	0.07 mg/L	0.0082 mg/L	Section 2.4	SW-7	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	1.5 mg/L	0.081 mg/L	Section 2.4	SW-1	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	10.0 mg/L	0.081 mg/L	Section 2.4	SW-2	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	1.9 mg/L	0.081 mg/L	Section 2.4	SW-3	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	2.6 mg/L	0.081 mg/L	Section 2.4	SW-5	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	2.6 mg/L	0.081 mg/L	Section 2.4	SW-6	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	9.2 mg/L	0.081 mg/L	Section 2.4	SW-7	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	4.3 mg/L	0.081 mg/L	Section 2.4	SW-8	NASSCO 1993-1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 11, 1994	Chromium	0.06 mg/L	0.05 mg/L	Section 2.4	SW-02	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
October 11, 1994	Copper	0.97 mg/L	0.0031 mg/L	Section 2.4	SW-02	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 11, 1994	Lead	0.07 mg/L	0.0081 mg/L	Section 2.4	SW-02	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 11, 1994	Nickel	0.28 mg/L	0.0082 mg/L	Section 2.4	SW-02	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 11, 1994	Zinc	11.0 mg/L	0.081 mg/L	Section 2.4	SW-02	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 10, 1994	Chromium	0.05 mg/L	0.05 mg/L	Section 2.4	SW-03	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 10, 1994	Chromium	0.06 mg/L	0.05 mg/L	Section 2.4	SW-05	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 10, 1994	Copper	1.9 mg/L	0.0031 mg/L	Section 2.4	SW-03	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 10, 1994	Copper	0.92 mg/L	0.0031 mg/L	Section 2.4	SW-05	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 10, 1994	Lead	0.15 mg/L	0.0081 mg/L	Section 2.4	SW-03	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 10, 1994	Lead	0.12 mg/L	0.0081 mg/L	Section 2.4	SW-05	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 10, 1994	Nickel	0.10 mg/L	0.0082 mg/L	Section 2.4	SW-03	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 10, 1994	Nickel	0.07 mg/L	0.0082 mg/L	Section 2.4	SW-05	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 10, 1994	Zinc	9.14 mg/L	0.081 mg/L	Section 2.4	SW-03	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 10, 1994	Zinc	14.0 mg/L	0.081 mg/L	Section 2.4	SW-05	NASSCO 1994-1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 21, 1995	Copper	0.20 mg/L	0.0031 mg/L	Section 2.4	SW-01	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 21, 1995	Copper	0.08 mg/L	0.0031 mg/L	Section 2.4	SW-02	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 21, 1995	Copper	0.29 mg/L	0.0031 mg/L	Section 2.4	SW-03	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 21, 1995	Copper	0.21 mg/L	0.0031 mg/L	Section 2.4	SW-05	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 21, 1995	Copper	0.42 mg/L	0.0031 mg/L	Section 2.4	SW-07	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 21, 1995	Lead	0.12 mg/L	0.0081 mg/L	Section 2.4	SW-07	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 21, 1995	Nickel	0.11 mg/L	0.0082 mg/L	Section 2.4	SW-01	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 21, 1995	Zinc	1.1 mg/L	0.081 mg/L	Section 2.4	SW-01	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 21, 1995	Zinc	0.84 mg/L	0.081 mg/L	Section 2.4	SW-02	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 21, 1995	Zinc	1.45 mg/L	0.081 mg/L	Section 2.4	SW-03	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 21, 1995	Zinc	2.5 mg/L	0.081 mg/L	Section 2.4	SW-05	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 21, 1995	Zinc	2.95 mg/L	0.081 mg/L	Section 2.4	SW-07	NASSCO 1995-1996 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Copper	1.2 mg/L	0.0031 mg/L	Section 2.4	SW-01	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Copper	0.39 mg/L	0.0031 mg/L	Section 2.4	SW-02	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Copper	0.86 mg/L	0.0031 mg/L	Section 2.4	SW-03	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Copper	0.46 mg/L	0.0031 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
October 30, 1996	Copper	0.56 mg/L	0.0031 mg/L	Section 2.4	SW-06	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Copper	1.1 mg/L	0.0031 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Copper	0.09 mg/L	0.0031 mg/L	Section 2.4	SW-08	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Lead	0.14 mg/L	0.0081 mg/L	Section 2.4	SW-01	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Lead	0.2 mg/L	0.0081 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Lead	0.11 mg/L	0.0081 mg/L	Section 2.4	SW-06	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Lead	0.38 mg/L	0.0081 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Nickel	0.38 mg/L	0.0082 mg/L	Section 2.4	SW-01	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Nickel	0.28 mg/L	0.0082 mg/L	Section 2.4	SW-02	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Nickel	0.28 mg/L	0.0082 mg/L	Section 2.4	SW-03	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
October 30, 1996	Nickel	0.31 mg/L	0.0082 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Nickel	0.21 mg/L	0.0082 mg/L	Section 2.4	SW-06	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Nickel	0.14 mg/L	0.0082 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Nickel	0.25 mg/L	0.0082 mg/L	Section 2.4	SW-08	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Zinc	7.0 mg/L	0.081 mg/L	Section 2.4	SW-01	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Zinc	5.0 mg/L	0.081 mg/L	Section 2.4	SW-02	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Zinc	7.2 mg/L	0.081 mg/L	Section 2.4	SW-03	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Zinc	7.9 mg/L	0.081 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Zinc	10.9 mg/L	0.081 mg/L	Section 2.4	SW-06	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 30, 1996	Zinc	12.3 mg/L	0.081 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
October 30, 1996	Zinc	14.0 mg/L	0.081 mg/L	Section 2.4	SW-08	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Chromium	0.06 mg/L	0.05 mg/L	Section 2.4	SW-01	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Chromium	0.09 mg/L	0.05 mg/L	Section 2.4	SW-03	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Chromium	0.24 mg/L	0.05 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Chromium	0.07 mg/L	0.05 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Copper	2.1 mg/L	0.0031 mg/L	Section 2.4	SW-01	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Copper	0.89 mg/L	0.0031 mg/L	Section 2.4	SW-02	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Copper	0.94 mg/L	0.0031 mg/L	Section 2.4	SW-03	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Copper	0.46 mg/L	0.0031 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Copper	1.2 mg/L	0.0031 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 21, 1996	Nickel	1.2 mg/L	0.0082 mg/L	Section 2.4	SW-01	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Nickel	0.35 mg/L	0.0082 mg/L	Section 2.4	SW-02	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Nickel	0.70 mg/L	0.0082 mg/L	Section 2.4	SW-03	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Nickel	0.48 mg/L	0.0082 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Nickel	0.79 mg/L	0.0082 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Zinc	11.9 mg/L	0.081 mg/L	Section 2.4	SW-01	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Zinc	6.5 mg/L	0.081 mg/L	Section 2.4	SW-02	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Zinc	8.1 mg/L	0.081 mg/L	Section 2.4	SW-03	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Zinc	16.5 mg/L	0.081 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 21, 1996	Zinc	9.4 mg/L	0.081 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
April 2, 1997	Chromium	0.2 mg/L	0.05 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Chromium	0.2 mg/L	0.05 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Copper	0.98 mg/L	0.0031 mg/L	Section 2.4	SW-01	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Copper	0.57 mg/L	0.0031 mg/L	Section 2.4	SW-02	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Copper	0.99 mg/L	0.0031 mg/L	Section 2.4	SW-03	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Copper	0.53 mg/L	0.0031 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Copper	0.76 mg/L	0.0031 mg/L	Section 2.4	SW-06	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Copper	2.6 mg/L	0.0031 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Copper	0.91 mg/L	0.0031 mg/L	Section 2.4	SD 9-14	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Lead	1.1 mg/L	0.0081 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
April 2, 1997	Nickel	0.2 mg/L	0.0082 mg/L	Section 2.4	SW-01	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Nickel	0.05 mg/L	0.0082 mg/L	Section 2.4	SW-02	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Nickel	0.05 mg/L	0.0082 mg/L	Section 2.4	SW-03	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Nickel	0.08 mg/L	0.0082 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Nickel	0.05 mg/L	0.0082 mg/L	Section 2.4	SW-06	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Nickel	0.17 mg/L	0.0082 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Nickel	0.09 mg/L	0.0082 mg/L	Section 2.4	SD 9-14	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Zinc	6.2 mg/L	0.081 mg/L	Section 2.4	SW-01	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Zinc	9.0 mg/L	0.081 mg/L	Section 2.4	SW-02	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Zinc	6.0 mg/L	0.081 mg/L	Section 2.4	SW-03	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
April 2, 1997	Zinc	8.6 mg/L	0.081 mg/L	Section 2.4	SW-05	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Zinc	12.0 mg/L	0.081 mg/L	Section 2.4	SW-06	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Zinc	14.7 mg/L	0.081 mg/L	Section 2.4	SW-07	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 2, 1997	Zinc	13.8 mg/L	0.081 mg/L	Section 2.4	SD 9-14	NASSCO 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.49 mg/L	0.0031 mg/L	Section 2.4	SW-01	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.24 mg/L	0.0031 mg/L	Section 2.4	SW-06	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	1.6 mg/L	0.0031 mg/L	Section 2.4	SWDS-01	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.88 mg/L	0.0031 mg/L	Section 2.4	SWDS-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.81 mg/L	0.0031 mg/L	Section 2.4	SWDS-3	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.37 mg/L	0.0031 mg/L	Section 2.4	SWDS-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 13, 1997	Copper	0.49 mg/L	0.0031 mg/L	Section 2.4	SD 2-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.32 mg/L	0.0031 mg/L	Section 2.4	SD 2-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.23 mg/L	0.0031 mg/L	Section 2.4	SD 2-4	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.76 mg/L	0.0031 mg/L	Section 2.4	SD 3-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.46 mg/L	0.0031 mg/L	Section 2.4	SD 5-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.25 mg/L	0.0031 mg/L	Section 2.4	SD 5-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	1.4 mg/L	0.0031 mg/L	Section 2.4	SD 7-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.11 mg/L	0.0031 mg/L	Section 2.4	SD 9-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.61 mg/L	0.0031 mg/L	Section 2.4	SD 9-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.4 mg/L	0.0031 mg/L	Section 2.4	SD 9-4	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 13, 1997	Copper	0.84 mg/L	0.0031 mg/L	Section 2.4	SD 9-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.74 mg/L	0.0031 mg/L	Section 2.4	SD 9-6	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.71 mg/L	0.0031 mg/L	Section 2.4	SD 9-7	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.55 mg/L	0.0031 mg/L	Section 2.4	SD 9-8	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.80 mg/L	0.0031 mg/L	Section 2.4	SD 9-9	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.57 mg/L	0.0031 mg/L	Section 2.4	SD 9-10	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.19 mg/L	0.0031 mg/L	Section 2.4	SD 9-11	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.51 mg/L	0.0031 mg/L	Section 2.4	SD 9-12	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.64 mg/L	0.0031 mg/L	Section 2.4	SD 9-14	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Copper	0.11 mg/L	0.0031 mg/L	Section 2.4	SD 9-15	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 13, 1997	Lead	0.10 mg/L	0.0081 mg/L	Section 2.4	SWDS-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Lead	0.11 mg/L	0.0081 mg/L	Section 2.4	SD 2-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Lead	0.17 mg/L	0.0081 mg/L	Section 2.4	SD 3-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Lead	0.46 mg/L	0.0081 mg/L	Section 2.4	SD 7-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Lead	0.17 mg/L	0.0081 mg/L	Section 2.4	SD 9-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Lead	0.24 mg/L	0.0081 mg/L	Section 2.4	SD 9-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.43 mg/L	0.0082 mg/L	Section 2.4	SW-01	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.62 mg/L	0.0082 mg/L	Section 2.4	SW 06	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.48 mg/L	0.0082 mg/L	Section 2.4	SWDS-01	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	1.2 mg/L	0.0082 mg/L	Section 2.4	SWDS-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 13, 1997	Nickel	0.43 mg/L	0.0082 mg/L	Section 2.4	SWDS-3	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.43 mg/L	0.0082 mg/L	Section 2.4	SWDS-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.66 mg/L	0.0082 mg/L	Section 2.4	SD 2-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.52 mg/L	0.0082 mg/L	Section 2.4	SD 2-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.72 mg/L	0.0082 mg/L	Section 2.4	SD 2-4	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.57 mg/L	0.0082 mg/L	Section 2.4	SD 3-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.95 mg/L	0.0082 mg/L	Section 2.4	SD 5-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.95 mg/L	0.0082 mg/L	Section 2.4	SD 5-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	1.0 mg/L	0.0082 mg/L	Section 2.4	SD 7-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.78 mg/L	0.0082 mg/L	Section 2.4	SD 9-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 13, 1997	Nickel	0.74 mg/L	0.0082 mg/L	Section 2.4	SD 9-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.6 mg/L	0.0082 mg/L	Section 2.4	SD 9-4	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.55 mg/L	0.0082 mg/L	Section 2.4	SD 9-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.36 mg/L	0.0082 mg/L	Section 2.4	SD 9-6	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.21 mg/L	0.0082 mg/L	Section 2.4	SD 9-7	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.48 mg/L	0.0082 mg/L	Section 2.4	SD 9-8	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.67 mg/L	0.0082 mg/L	Section 2.4	SD 9-9	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.07 mg/L	0.0082 mg/L	Section 2.4	SD 9-10	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.76 mg/L	0.0082 mg/L	Section 2.4	SD 9-11	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.49 mg/L	0.0082 mg/L	Section 2.4	SD 9-12	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 13, 1997	Nickel	0.74 mg/L	0.0082 mg/L	Section 2.4	SD 9-14	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Nickel	0.58 mg/L	0.0082 mg/L	Section 2.4	SD 9-15	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	1.7 mg/L	0.081 mg/L	Section 2.4	SW-01	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	2.8 mg/L	0.081 mg/L	Section 2.4	SW 06	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	2.4 mg/L	0.081 mg/L	Section 2.4	SWDS-01	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	2.4 mg/L	0.081 mg/L	Section 2.4	SWDS-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	1.6 mg/L	0.081 mg/L	Section 2.4	SWDS-3	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	0.8 mg/L	0.081 mg/L	Section 2.4	SWDS-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	7.1 mg/L	0.081 mg/L	Section 2.4	SD 2-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	1.7 mg/L	0.081 mg/L	Section 2.4	SD 2-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 13, 1997	Zinc	5.0 mg/L	0.081 mg/L	Section 2.4	SD 2-4	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	3.3 mg/L	0.081 mg/L	Section 2.4	SD 3-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	2.0 mg/L	0.081 mg/L	Section 2.4	SD 5-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	3.9 mg/L	0.081 mg/L	Section 2.4	SD 5-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	5.3 mg/L	0.081 mg/L	Section 2.4	SD 5-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	4.7 mg/L	0.081 mg/L	Section 2.4	SD 9-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	2.8 mg/L	0.081 mg/L	Section 2.4	SD 9-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	1.9 mg/L	0.081 mg/L	Section 2.4	SD 9-4	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	5.9 mg/L	0.081 mg/L	Section 2.4	SD 9-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	9.7 mg/L	0.081 mg/L	Section 2.4	SD 9-6	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 13, 1997	Zinc	5.8 mg/L	0.081 mg/L	Section 2.4	SD 9-7	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	4.1 mg/L	0.081 mg/L	Section 2.4	SD 9-8	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	3.4 mg/L	0.081 mg/L	Section 2.4	SD 9-9	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	5.9 mg/L	0.081 mg/L	Section 2.4	SD 9-10	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	1.6 mg/L	0.081 mg/L	Section 2.4	SD 9-11	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	4.4 mg/L	0.081 mg/L	Section 2.4	SD 9-12	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	5.8 mg/L	0.081 mg/L	Section 2.4	SD 9-14	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 13, 1997	Zinc	0.95 mg/L	0.081 mg/L	Section 2.4	SD 9-15	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	2.2 mg/L	0.0031 mg/L	Section 2.4	SW-01	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.27 mg/L	0.0031 mg/L	Section 2.4	SW-02	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 25, 1998	Copper	0.34 mg/L	0.0031 mg/L	Section 2.4	SW-03	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.11 mg/L	0.0031 mg/L	Section 2.4	SW-05	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.08 mg/L	0.0031 mg/L	Section 2.4	SW-06	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.19 mg/L	0.0031 mg/L	Section 2.4	SW-07	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.26 mg/L	0.0031 mg/L	Section 2.4	SWDS-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.10 mg/L	0.0031 mg/L	Section 2.4	SWDS-4	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.72 mg/L	0.0031 mg/L	Section 2.4	SWDS-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.28 mg/L	0.0031 mg/L	Section 2.4	SD 9-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	1.5 mg/L	0.0031 mg/L	Section 2.4	SD 9-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.16 mg/L	0.0031 mg/L	Section 2.4	SD 9-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 25, 1998	Copper	0.21 mg/L	0.0031 mg/L	Section 2.4	SD 9-6	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	1.6 mg/L	0.0031 mg/L	Section 2.4	SD 9-7	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.60 mg/L	0.0031 mg/L	Section 2.4	SD 9-8	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	1.2 mg/L	0.0031 mg/L	Section 2.4	SD 9-9	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	1.0 mg/L	0.0031 mg/L	Section 2.4	SD 9-10	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.65 mg/L	0.0031 mg/L	Section 2.4	SD 9-11	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.16 mg/L	0.0031 mg/L	Section 2.4	SD 9-12	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	1.6 mg/L	0.0031 mg/L	Section 2.4	SD 9-14	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.13 mg/L	0.0031 mg/L	Section 2.4	SD 9-15	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Lead	0.26 mg/L	0.0081 mg/L	Section 2.4	SW-01	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 25, 1998	Lead	0.38 mg/L	0.0081 mg/L	Section 2.4	SW-05	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Lead	0.17 mg/L	0.0081 mg/L	Section 2.4	SD 9-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Lead	0.12 mg/L	0.0081 mg/L	Section 2.4	SD 9-7	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Lead	0.13 mg/L	0.0081 mg/L	Section 2.4	SD 9-11	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Lead	0.92 mg/L	0.0081 mg/L	Section 2.4	SD 9-14	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.22 mg/L	0.0082 mg/L	Section 2.4	SW-01	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.27 mg/L	0.0082 mg/L	Section 2.4	SW-02	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.28 mg/L	0.0082 mg/L	Section 2.4	SW-03	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.22 mg/L	0.0082 mg/L	Section 2.4	SW-05	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.32 mg/L	0.0082 mg/L	Section 2.4	SW-06	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 25, 1998	Nickel	0.25 mg/L	0.0082 mg/L	Section 2.4	SW-07	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.15 mg/L	0.0082 mg/L	Section 2.4	SWDS-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.33 mg/L	0.0082 mg/L	Section 2.4	SWDS-4	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.39 mg/L	0.0082 mg/L	Section 2.4	SWDS-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.13 mg/L	0.0082 mg/L	Section 2.4	SD 9-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.33 mg/L	0.0082 mg/L	Section 2.4	SD 9-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.20 mg/L	0.0082 mg/L	Section 2.4	SD 9-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.28 mg/L	0.0082 mg/L	Section 2.4	SD 9-6	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.71 mg/L	0.0082 mg/L	Section 2.4	SD 9-7	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.32 mg/L	0.0082 mg/L	Section 2.4	SD 9-8	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 25, 1998	Nickel	0.21 mg/L	0.0082 mg/L	Section 2.4	SD 9-9	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.36 mg/L	0.0082 mg/L	Section 2.4	SD 9-10	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.21 mg/L	0.0082 mg/L	Section 2.4	SD 9-11	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.24 mg/L	0.0082 mg/L	Section 2.4	SD 9-12	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.35 mg/L	0.0082 mg/L	Section 2.4	SD 9-14	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Nickel	0.19 mg/L	0.0082 mg/L	Section 2.4	SD 9-15	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	4.5 mg/L	0.081 mg/L	Section 2.4	SW-01	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	1.6 mg/L	0.081 mg/L	Section 2.4	SW-02	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	1.1 mg/L	0.081 mg/L	Section 2.4	SW-03	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	1.1 mg/L	0.081 mg/L	Section 2.4	SW-05	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 25, 1998	Zinc	0.48 mg/L	0.081 mg/L	Section 2.4	SW-06	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	0.93 mg/L	0.081 mg/L	Section 2.4	SW-07	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	0.97 mg/L	0.081 mg/L	Section 2.4	SWDS-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	0.80 mg/L	0.081 mg/L	Section 2.4	SWDS-4	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	1.6 mg/L	0.081 mg/L	Section 2.4	SWDS-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	1.1 mg/L	0.081 mg/L	Section 2.4	SD 9-1	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	4.3 mg/L	0.081 mg/L	Section 2.4	SD 9-2	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	0.79 mg/L	0.081 mg/L	Section 2.4	SD 9-5	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	1.1 mg/L	0.081 mg/L	Section 2.4	SD 9-6	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	5.9 mg/L	0.081 mg/L	Section 2.4	SD 9-7	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 25, 1998	Zinc	1.6 mg/L	0.081 mg/L	Section 2.4	SD 9-8	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	3.7 mg/L	0.081 mg/L	Section 2.4	SD 9-9	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	3.7 mg/L	0.081 mg/L	Section 2.4	SD 9-10	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	2.2 mg/L	0.081 mg/L	Section 2.4	SD 9-11	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	1.2 mg/L	0.081 mg/L	Section 2.4	SD 9-12	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	4.7 mg/L	0.081 mg/L	Section 2.4	SD 9-14	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 25, 1998	Zinc	0.68 mg/L	0.081 mg/L	Section 2.4	SD 9-15	NASSCO 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

1. 40 CFR 131.38
2. Reference to Section 2.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 2.4.
3. The cited waste discharge requirement(s) can be found in Section 2.5 of this Technical Report.

2.9. Prior History of Enforcement Actions for Violations of NPDES Requirements

2.9.1. Administrative Civil Liability Orders

On May 22, 1989, the San Diego Water Board issued Complaint No. 89-42 Administrative Civil Liability to NASSCO, for the discharge of spent abrasive waste from a floating dry dock to San Diego Bay and to have operated its graving dock in a manner that was in violation of Order No.

85-05, NPDES No. CA0107671. NASSCO elected to waive a hearing and accepted liability for the discharge of cooling water contaminated with wastes from the hull and freeboard abrasive blasting operations to San Diego Bay, failing to prevent miscellaneous water flows from coming in contact with sand blast residue in the graving dock, and the discharge of slurry blast wastes to San Diego Bay. NASSCO agreed to pay a total civil penalty of $10,000.

On January 30, 2001, the San Diego Water Board issued Complaint No. 2001-24 Administrative Civil Liability to NASSCO, for violations of the storm water runoff requirements of its NPDES permit. NASSCO sampled twenty-one discharge points on February 12, 2000, with all samples results showing toxic responses that violated the storm water discharge requirements of Order No. 97-36, NPDES permit No. CAG039001. The San Diego Water Board determined that each sample failure was a violation and assessed a civil liability fine of $135,801 against NASSCO.

2.10. Industry-wide Historical Operational Practices

In November of 1997, the U.S. Environmental Protection Agency released a study titled "EPA Office of Compliance Sector Notebook Project: PROFILE OF SHIPBUILDING AND REPAIR INDUSTRY." According to the 1995 Toxic Release Inventory (TRI) data, the reporting shipbuilding and repair facilities released and transferred 39 different TRI chemicals for a total of approximately 6.5 million pounds of pollutants during calendar year 1995. These releases and transfers were dominated by volatile organic compounds (VOCs) and metal-bearing wastes, approximately 52 percent and 48 percent respectively (U.S. EPA, 1997c).

Releases to the air, water, and land have accounted for 37 percent (2.4 million pounds) of the reporting shipbuilding and repair facilities' total reportable chemicals. Of these releases, over 98 percent were released to the air from fugitive (74.6 percent; 1,778,818 pounds) or point (24.1 percent; 574,097 pounds) sources, while approximately 1.2 percent (29,479 pounds) was release directly to water (U.S. EPA, 1997c). However, a significant percentage of the total pollutants released as fugitive air or point air releases end up in the water, adding significantly to the 1.2 percent which is released directly to water.

VOCs accounted for about 86 percent of the reporting shipbuilding and repair facilities' reported TRI releases. Xylenes, n-butyl alcohol, toluene, methyl ethyl ketone, and methyl isobutyl ketone account for about 65 percent of the reporting shipbuilding and repair facilities' reported releases. These organic compounds are typically found in solvents that were used extensively by the industry in thinning paints and for cleaning and degreasing metal parts and equipment (U.S. EPA, 1997c).

The remainder of the releases was primarily metal-bearing wastes. Copper, zinc, and nickel-bearing wastes accounted for about 14 percent of the reporting shipbuilding and repair facilities' reported releases. These pollutants were released primarily as fugitive emissions during metal plating operations and as overspray in painting operations and could also have been released as fugitive dust emissions during blasting operations (U.S. EPA, 1997c).

3. Finding 3: BAE Systems San Diego Ship Repair, Inc., Formerly Southwest Marine, Inc. (Southwest Marine)

Finding 3 of CAO No. ~~R9-2011-0001~~R9-2012-0024 states:

The San Diego Water Board ~~alleges, but BAE Systems denies,~~ finds that BAE Systems caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. These wastes contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH.

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

3.1. Jurisdiction

~~CWC~~Water Code ~~s~~section 13304 contains the cleanup and abatement authority of the San Diego Water Board. Section 13304(a) provides in relevant part that the San Diego Water Board may issue a cleanup and abatement order to any person who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance….”

For the reasons set forth below, the San Diego Water Board has determined that Southwest Marine, Inc. (SWM) and its successor BAE Systems should be named as dischargers in Cleanup and Abatement Order No. R9-~~2010-0002~~2012-0024 pursuant to ~~CWC~~Water Code ~~s~~section 13304.

3.2. Admissible Evidence – State Water Resources Control Board Resolution No. 92-49

On June 18, 1992 (amended on April 21, 1994 and October 2, 1996) the State Water Board adopted Resolution No. 92-49, Policies And Procedures For The Investigation And Cleanup And Abatement Of Discharges Under ~~CWC~~ Water Code ~~s~~section 13304. Resolution No. 92-49 provides in part that:

II. The San Diego Water Board shall apply the following procedures in determining whether a person shall be required to investigate a discharge under ~~CWC~~ Water Code ~~s~~section 13267, or to clean up waste and abate the effects of a discharge or a threat of a discharge under ~~CWC s~~Water Code section 13304. The San Diego Water Board shall:

A. Use any relevant evidence, whether direct or circumstantial, including, but not limited to, evidence in the following categories:

1. Documentation of historical or current activities, waste characteristics, chemical use, storage or disposal information, as documented by public records, responses to questionnaires, or other sources of information;

2. Site characteristics and location in relation to other potential sources of a discharge;

3. Hydrologic and hydrogeologic information, such as the difference in upgradient and downgradient water quality;

4. Industry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills, and clarifiers;

5. Evidence of poor management of materials or wastes, such as improper storage practices or inability to reconcile inventories;

6. Lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal;

7. Physical evidence, such as analytical data, soil or pavement staining, distressed vegetation, or unusual odor or appearance;

8. Reports and complaints;

9. Other agencies' records of possible known discharge; and

10. Refusal or failure to respond to San Diego Water Board inquiries.

3.3. BAE Systems Owns and Operates the San Diego Ship Repair Facility

3.3.1. Facility Description

From 1979 to the present, SWM and its successor BAE,[33] 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 is located on land leased from the Port District at 2205 East Belt Street, foot of

[33] BAE Systems, Inc. acquired Southwest Marine, Inc. on June 28, 2005 and Southwest Marine, Inc. simultaneously changed its name to BAE Systems San Diego Ship Repair Inc.

Sampson Street in San Diego, San Diego County, California. The facility covers approximately 39.6 acres of tidelands property, leased from the Port District from 1979 to the present. The land portion and offshore area of the lease includes approximately 23 acres and 16.6 acres, respectively. BAE Systems' primary business has historically been ship repair and maintenance for the U.S. Navy and commercial customers.

Ship repair facilities at BAE Systems have historically included five piers, two floating dry docks and two marine railways, which, together with cranes, enable ships to be launched or repaired. The basic purpose of the dry dock is to separate the vessel from the bay to provide access to parts of the ship normally underwater. The piers are used to support berthed vessels that are undergoing maintenance and repair operations as well as berthing barges used to house vessel crews while ship repairs are being conducted. Because dry dock space is limited and expensive, many operations are conducted pier side. Marine railways were used to wheel vessels out of water (also called dry berthing a vessel). Activities conducted on dry berthed vessels are similar to those conducted in dry docks, but usually on a much smaller scale. The marine railways, located between Piers 1 and 2, were removed in 1998.

On-shore facilities also included an abrasive blasting building and a paint spray booth area located at the foot of Pier 3 on the southeast section of the facility. On the northern end of the facility is an area used for steam cleaning/pressure washing of vehicles and equipment. This area includes a sump where the effluent is collected and drained to a three-stage clarifier that is connected to the Metropolitan Sanitary Sewer System. Other shore-side facilities include manufacturing and storage areas to support ship repair operations and material staging. Material staging is managed by zones for incoming and outgoing material to and from ships and shops.

BAE Systems manages a solid waste reclamation and recycling area, located at the foot of the gantry crane tracks adjacent to Belt Street, south of Building 8. The solid waste and recycling area segregates, consolidates, reclaims, recycles, and disposes municipal solid waste that is typically generated by shipyard activities. These wastes include metals, wood, and paper/cardboard. A hazardous waste reclamation facility, located west of the solid waste reclamation and recycling area, handles the spent abrasives, paint wastes, oil wastes, oil-contaminated debris, and miscellaneous chemicals removed from ships.

3.3.2. Activities Conducted by BAE Systems

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.

These activities involve a multitude of industrial processes, many of which have been conducted over San Diego Bay waters or very close to the waterfront. 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. The industrial processes at the BAE Systems facility included the following:

- **Surface Preparation and Paint Removal**. Methods of surface preparation and paint removal include dry abrasive blasting, wet abrasive or slurry blasting, hydroblasting, and chemical paint stripping;

- **Paint Application**. After preparation, surfaces are painted. Most painting occurs in a dry dock and involves the ship hull and internal tanks. Painting is also conducted in other locations throughout the shipyard including piers and berths. Paint application is accomplished by way of air or airless spraying equipment and is a major activity at BAE Systems;

- **Tank Cleaning**. Tank cleaning operations use steam to remove dirt and sludges from internal tanks, particularly fuel tanks and bilges. Detergents, cleaners, and hot water may be injected into the steam supply hoses. BAE Systems reports that wastewater generated has typically been removed and disposed of at an on-site treatment facility;

- **Mechanical Repair/Maintenance/Installation**. A variety of mechanical systems and machinery require repair, maintenance, and installation;

- **Structural Repair/Alteration/Assembly**. Structural repair, alteration, and assembly generally involve welding, cutting, and fastening of steel plates or assembly blocks and other industrial processes;

- **Integrity/Hydrostatic Testing**. Hydrostatic or strength testing, and flushing are conducted on hulls, tanks, or pipe repairs. Integrity testing is also conducted on new systems during ship construction phases;

- **Paint Equipment Cleaning**. All air and airless paint spraying equipment is typically cleaned following use. Paint equipment cleaning is a major producer of waste, including solvents, thinners, and paint wastes, and sludges;

- **Engine Repair/Maintenance/Installation**. Automotive repair, ship engine repair, maintenance, and installation generate waste oils, solvents, fuels, batteries, and filters;

- **Steel Fabrication and Machining**. Fabrication of engine and ship parts occurs at BAE Systems. Cutting oils, fluids, and solvents are used extensively including acetone, methyl ethyl ketone (MEK) and chlorinated solvents;

- **Electrical Repair/Maintenance/Installation**. The repair, maintenance, and installation of electrical systems involve the use of numerous hazardous materials including trichlorethylene, trichloroethane, methylene chloride, and acetone;

- **Hydraulic Repair/Maintenance/Installation**. The repair, maintenance, and installation of hydraulic systems involve the replacement of spent hydraulic oils;

- **Tank Emptying**. Bilge, fuel, and ballast tanks are typically emptied prior to ship repair activities;

- **Fueling**. Fueling operations occur at BAE Systems;

- **Shipfitting**. Shipfitting is conducted at BAE Systems, and is defined as the forming of ship plates and shapes, etc. according to plans, patterns, or molds;

- **Carpentry**. Woodworking, with associated wood dust production, is conducted at BAE Systems; and

- **Refurbishing/Modernization/Cleaning**. Refurbishing, modernization, and cleaning of ship processes are conducted at BAE Systems.

3.3.3. Materials Used by BAE Systems

Materials commonly used at BAE Systems are summarized below. Although a few specific materials are included, the list consists primarily of major categories.

- **Abrasive Grit**. Typically slag is collected from coal-fired boilers and consists principally of iron, aluminum, silicon, and calcium oxides. Trace elements such as copper, zinc, and titanium are also present. Sand, cast iron, or steel shot are also used as abrasives. Enormous amounts of abrasive are needed to remove paint; removing paint from a 15,000 square foot hull can take up to 6 days and consume 87 tons of grit. Grit is needed in all dry and wet abrasive blasting.

- **Paint**. Paints contain copper, zinc, chromium, and lead as well as hydrocarbons. Two major types of paints used on ship hulls are:

    - Anticorrosive paints (primers) vinyl, vinyl-lead, or epoxy-based coatings are used. Others contain zinc chromate and lead oxide.

    - Antifouling paints are used to prevent growth and attachment of marine organisms by continuously releasing toxic substances into the water. Cuprous oxide and tributyltin fluoride or tributyltin oxide are the principal toxicants in copper-based and organotin-based paints, respectively.

- **Miscellaneous Materials**. Oils (engine, cutting, and hydraulic), lubricants, grease, fuels, weld, detergents, cleaners, rust inhibitors, paint thinners, hydrocarbon and chlorinated solvents, degreasers, acids, caustics, resins, adhesives/cement/sealants, and chlorine.

3.3.4. Waste Generated by BAE Systems

Categories of wastes commonly generated by BAE Systems' industrial processes include, but are not limited to, those listed below.

- **Abrasive Blast Waste: Spent Grit, Spent Paint, Marine Organisms, and Rust**. Abrasive blast waste, consisting of spent grit, spent paint, marine organisms, and rust is generated in significant quantities during all dry or wet abrasive blasting procedures. The constituent of greatest concern with regard to toxicity is the spent paint, particularly the copper and tributyltin antifouling components, which are designed to be toxic and to continuously leach into the water. Other pollutants in paint included zinc, chromium, and lead. Abrasive blast waste can be conveyed by water flows, become airborne (especially during dry blasting), or fall directly into receiving waters. Based on available data for the years 1987 through 1991, BAE Systems generates an average of 178 tons of abrasive blast waste per month.

- **Fresh Paint**. Losses occur when paint ends up somewhere other than its intended location (e.g., dry dock floor, bay, worker's clothing). These losses result from spills, drips, and overspray. Typical overspray losses are estimated at approximately 5 percent for air spraying, and 1 to 2 percent for airless spraying.

- **Bilge Waste/Other Oily Wastewater**. This waste is generated during tank emptying, leaks, and cleaning operations (bilge, ballast, fuel tanks). In addition to petroleum products (fuel, oil), tank wash water also contains detergents or cleaners and is generated in large quantities.

- **Blast Wastewater**. Hydroblasting generates large quantities of wastewater. In addition to suspended and settleable solids (spent abrasive, paint, rust, marine organisms) and water, blast wastewater also contains rust inhibitors such as diammonium phosphate and sodium nitrite.

- **Oils (engine, cutting, and hydraulic)**. In addition to spent products, fresh oils, lubricants, and fuels are released as a result of spills and leaks from ship or dry dock equipment, machinery, and tanks (especially during cleaning and refueling).

- **Waste Paints/Sludges/Solvents/Thinners**. These wastes are generated from cleaning paint equipment.

- **Construction/Repair Wastes and Trash**. These wastes include scrap metal, welding rods, slag (from arc welding), wood, rags, plastics, cans, paper, bottles, packaging materials, etc.

- **Miscellaneous Wastes**. These wastes include lubricants, grease, fuels, sewage (black and gray water from vessels or docks), boiler blowdown, condensate, discard, acid wastes, caustic wastes, and aqueous wastes (with and without metals).

3.3.5. Abrasive Blast Waste and Other Waste Discharges - Sampling Results

During numerous inspections, San Diego Water Board inspectors observed abrasive blast waste and other wastes deposited in areas where it would probably be discharged into the waters of the state via storm water runoff (see Section 3.6 BAE Systems Waste Discharges). Samples of abrasive blast waste and other wastes were collected in the vicinity of storm drains, or in other areas susceptible to being transported to San Diego Bay, during inspections on March 3, 1987, November 9, 1988, February 24 and 27, 1989, May 31, 1989, and August 14 and 15, 1989.

3.3.5.1. 1987 Inspections and Sampling

During an inspection on March 3, 1987, the San Diego Water Board inspector noted violations of the NPDES permit and reported "… this facility discharged water from the dry dock to the San Diego Bay." (RWQCB, 1987a). The inspector observed water carrying sand blasting grit and oil discharged to the bay. A follow-up inspection on March 18, 1987 noted the problem stilled existed and it appeared no corrective actions had been implemented (RWQCB, 1987b). Sample DTQ 867-407D was collected from undiluted discharge from the dry dock. The analytical results are shown in Table 3-1, below.

3.3.5.2. 1988 Inspections and Sampling

During an inspection on November 9, 1988, the San Diego Water Board inspector noted violations of the NPDES permit and reported "Sand blast waste and sewage are being discharged to San Diego Bay" (RWQCB, 1988a). Samples LKM 889-90137-035A and LKM 889-90137-035B were collected from sand blast waste that had accumulated on the barge and from San Diego Bay sediment where the waste entered the bay directly. The analytical results are shown in Table 3-1, below.

A subsequent inspection on November 15, 1988 noted that none of the violations cited in the previous inspection had been corrected (RWQCB, 1988b).

3.3.5.3. 1989 Inspections and Sampling

The San Diego Water Board conducted a series of inspections in February, May, and August 1989. Abrasive blast waste was noted during inspections on February 24 and 27, May 31, August 10, 15, and August 16 where it would probably be discharged into San Diego Bay via storm water runoff, tidal action from the bay, or whenever the dry dock was submerged. The February 27, 1989 inspection noted potential problems as "The small floating dry dock has a wooden deck through which sand blast waste falls. This should be cleaned prior to sinking the dry dock." and "The large floating dry dock appears to have been sunk with sand blast waste in the port-aft stairwell." (RWQCB, 1989c).

During the inspections, samples were collected from various locations and analyzed for metals. On February 24, a sediment sample, DSJ-889-087, was collected from San Diego Bay and on February 27 another sample, LKM 889-112-5, was collected near the marine railway. Additional samples near the marine railways, LKM 889-200-E and F, were collected in May. During the August inspections, samples LKM 890-37-A through D was also collected from the Pride of San Diego and the small floating dry dock. In his summary report for the August inspections, the inspector reported that "The available evidence shows that both dry docks were sunk with sand blast waste on board in violation of Prohibition A.2." The analytical results are presented in Table 3-1, below (RWQCB, 1989d).

Table 3-1 Abrasive Blast Waste Sampling Results

Chemical	DTQ 867-407D[2,3]	LKM-90137-035A[2,3]	LKM-90137-035B[3]	DSJ 889-087[3]	LKM 889-112-5[3]	LKM 889-200-E[3]	Background
Date	3/18/87	11/9/88	11/9/88	2/24/89	2/27/89	5/31/89	
Metals							
Arsenic (mg/kg)	0.54	<0.55	89	99.3	<23.4	133	7.5
Chromium (mg/kg)	7.5	<0.055	5.9	68.5	28.9	140	57
Copper (mg/kg)	85	<0.066	2,800[1]	323	6,690[1]	2,200	121
Lead (mg/kg)	1.8	<0.27	54	1,120	130	520	53
Mercury (mg/kg)	0.0067	0.003	<0.05	1.10	<0.50	0.231	0.57
Nickel (mg/kg)	1.5	<0.11	<0.38	18.4	18.1	25.6	15
Silver (mg/kg)	0.02	<0.044	<0.15	<2.28	5.20	4.18	1.1
Zinc (mg/kg)	2,000	<0.044	580	234	5,010[1]	5,556[1]	129

1. The result exceeds criteria for characterization of hazardous waste per California Code of Regulations, Title 22, Chapter 11, section 66261.24. The total threshold limit concentration (TTLC) for copper is 2500 mg/kg and the TTLC for zinc is 5000 mg/kg. The TTLC represents the total concentration of a constituent that may be present before a waste is classified as a hazardous waste.
2. Chemistry units in mg/l.
3. Sample collected in San Diego Bay near discharge location.
4. Sample collected from Pride of San Diego or small floating dry dock.

Table 3-1. Continued. Abrasive Blast Waste Sampling Results

Chemical	LKM 889-200-F[3]	LKM 890-37A[4]	LKM 890-37B[4]	LKM 890-37C[4]	LKM 890-37D[4]	Background
Date	5/31/89	8/14/89	8/14/89	8/14/89	8/15/89	
Metals						
Arsenic (mg/kg)	147	21.6	24.6	16.8	26.5	7.5
Chromium (mg/kg)	158	9.33	24.0	12.07	22.6	57
Copper (mg/kg)	3,464[1]	3,635[1]	2,500[1]	4,210[1]	5,538[1]	121
Lead (mg/kg)	856	534	53.6	214	61.0	53
Mercury (mg/kg)	0.145	<0.051	0.050	<0.062	<0.061	0.57
Nickel (mg/kg)	26.4	6.24	18.4	8.27	17.0	15
Silver (mg/kg)	5.59	2.54	2.39	2.33	4.59	1.1
Zinc (mg/kg)	6,567[1]	1,698	987	653	1,713	129

5. The result exceeds criteria for characterization of hazardous waste per California Code of Regulations, Title 22, Chapter 11, section 66261.24. The total threshold limit concentration (TTLC) for copper is 2500 mg/kg and the TTLC for zinc is 5000 mg/kg. The TTLC represents the total concentration of a constituent that may be present before a waste is classified as a hazardous waste.
6. Chemistry units in mg/l.
7. Sample collected near discharge location.
8. Sample collected from Pride of San Diego or small floating dry dock.

3.3.5.4. Discussion of Sampling Results

The inspections and analytical results indicate that abrasive blast wastes and other waste with elevated levels of metals have been discharged or deposited where they were, or probably will be, discharged into San Diego Bay creating, or threatening to create, a condition of pollution or nuisance. The analytical laboratory results for arsenic, chromium, copper, lead, mercury, nickel, silver, and zinc exceed the background sediment chemistry levels presented in Section 29 of this Technical Report at least once from the 11 samples collected. Copper and zinc samples exceed the background sediment chemistry levels in 9 out of the 11 samples.

Seven of the samples (LKM 90137-035B, LKM 889-112-5, LKM 889-200-F, LKM 890-37A, B, C, and D) exceed the criteria for total concentration of copper that may be present before the waste is classified as hazardous waste due to toxicity and 3 of the samples (LKM 889-112-5, LKM 889-200-E, and LKM 889-200-F) exceed the hazardous waste classification criteria for zinc (CCR Title 22). Furthermore, sample DSJ 889-087 exceed the hazardous waste classification criteria for lead (CCR Title 22). Under Title 22 the waste would be classified as hazardous and proper disposal would be in a Class I Landfill licensed to receive hazardous waste.

3.4. BAE Systems Discharged Waste to San Diego Bay Creating Pollution, Contamination, and Nuisance Conditions in San Diego Bay

BAE Systems has discharged waste, or deposited waste where it was discharged, into San Diego Bay and created, or threatens to create, a condition of pollution, contamination, and nuisance. ~~CWC s~~Water Code section 13304 requires that a person who causes any waste to be discharged, or deposited where it probably will be discharged, into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance is subject to cleaning up or abating the effects of the waste.

Pollutants generated at the BAE Systems facility as a result of shipyard activities include metals, butyltins, PCBs, PCTs, PAHs, and petroleum hydrocarbons. Many of these same pollutants are present in the marine sediment adjacent to the BAE Systems facility in highly elevated concentrations as compared to sediment chemistry levels found at off-site reference stations located in areas of San Diego Bay.[34]

The Shipyard Report (Exponent, 2003) made the following findings about the chemical conditions at the Shipyard Sediment Site:

- The highest concentrations of most chemicals are found at the northern boundary of the BAE Systems site;
- The highest concentrations of PAH are found in proximity of the municipal storm drain outfall in the BAE Systems leasehold;

[34] See Section 16 of this Technical Report.

- Elevated concentrations of metals are also found near the municipal storm drain outfall in the BAE Systems leasehold;

- Elevated concentrations of PCBs are found near the northern boundary of BAE Systems, at the storm drain outfall on BAE Systems' leasehold, and at the foot of Sicard Street on the boundary of the two shipyards (BAE Systems and NASSCO);

- Petroleum hydrocarbons are distributed similarly to metals and PCBs, with an additional area of elevation near the southern boundary of NASSCO's leasehold; and

- Concentrations of all chemicals generally decrease with distance from shore.

BAE Systems has a history of discharging substantial quantities of pollutants to San Diego Bay as a result of systemic problems and overall inadequacies in the implementation of its Best Management Practices Program to prevent such discharges. Some of BAE Systems' discharges are presented in Sections 3.6, 3.7, 3.8 and 3.9 of this Technical Report. As described in Sections 14 through 28 of this Technical Report, these same pollutants in the discharges have accumulated in San Diego Bay sediment adjacent to the BAE facility in concentrations that:

11. Adversely affect the beneficial uses of San Diego Bay as described in later sections of this Technical Report;

12. Cause pollution, contamination, or nuisance[35] conditions in San Diego Bay; and

13. Degrade marine communities, cause adverse effects on the environment or the public health, or result in harmful concentrations of pollutants in marine sediment.

The Porter-Cologne Water Quality Act defines "pollution" is defined as "an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects … the waters for beneficial uses …."[36] "Contamination" is defined as "an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."[37]

Accordingly it is concluded that BAE Systems has caused or permitted the discharge of waste to San Diego Bay in a manner causing the creation of pollution or nuisance conditions and that it is appropriate for the San Diego Water Board to issue a cleanup and abatement order naming BAE Systems as a discharger pursuant to ~~CWC s~~Water Code section 13304.

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[35] BAE System's discharge of pollutants at the Shipyard Sediment Site has created or threatens to create a condition of nuisance in waters of the State. The discharges have caused or contributed to the accumulation of pollutants in the sediment in concentrations that are potentially injurious to the public health and affects a considerable number of persons as provided in Water Code section 13050(m).

[36] Water Code section 13050(1).

[37] Water Code section 13050(k).

Further discussion on pollution, contamination, and nuisance are available in Sections 1.4 and 1.5 of this Technical Report.

3.5. NPDES Requirement Regulation

Waste discharges from the BAE Systems facility have historically been regulated under Waste Discharge Requirements (WDRs) prescribed by the San Diego Water Board pursuant to CWA section 402 and ~~CWC s~~Water Code section 13376. These requirements are referred to as either NPDES requirements[38] or by the federal terminology "NPDES Permit." BAE Systems' first NPDES requirements started in 1979, when the San Diego Water Board issued WDRs to regulate specific shipyard activities (hereafter referred to as Shipyard NPDES Permit). A listing of the NPDES requirements adopted by the San Diego Water Board in effect at the time the facility was owned and operated by Southwest Marine, Inc., and its successor, BAE Systems, is provided in Table 3-2 below.

Table 3-2 Southwest Marine/BAE Systems NPDES Permits

Order Number/ NPDES No.	Order Title	Adoption Date	Expiration Date
Order No. 79-74, NPDES No. CA0107697	Waste Discharge Requirements For Southwest Marine, Inc.	November 26, 1979	April 18, 1983
Order No. 83-11, NPDES No. CA0107697	Waste Discharge Requirements and Monitoring And Reporting Program For Southwest Marine, Inc. County Of San Diego	April 18, 1983	October 15, 1997
Order No. 97-36, NPDES No. CAG039001	Waste Discharge Requirements and Monitoring And Reporting Program For Discharges From Ship Construction, Modification, Repair, And Maintenance Facilities And Activities Located In The San Diego Region (TTWQ/CPLX 1A)	October 15, 1997	November 13, 2002
Order No. R9-2002-0161 NPDES No. CA0109151	Waste Discharge Requirements For Southwest Marine, Inc. San Diego County	November 13, 2002	June 10, 2009
Order No. R9-2009-0080 NPDES No. CA0109151	Waste Discharge Requirements, BAE Systems San Diego Ship Repair Inc., Discharge to the San Diego Bay	June 10, 2009	Present

38 Pursuant to Chapter 5.5 of the Porter-Cologne Water Quality Act, to avoid the issuance by the United States Environmental Protection Agency of separate and duplicative NPDES permits for discharges in California that would be subject to the Clean Water Act, the State's Waste Discharge Requirements (WDRs) for such discharges implement the NPDES regulations and entail enforcement provisions that reflect the penalties imposed by the Clean Water Act for violation of NPDES permits issued by the U.S. EPA. Thus, the State's WDRs that implement federal NPDES regulations (NPDES requirements) serve in lieu of NPDES permits.

Pursuant to the NPDES requirements cited above, SWM and its successor BAE Systems were required to develop and implement "Best Management Practices"[39] (BMPs) plans to limit discharges of pollutants into San Diego Bay. As described in the current NPDES requirements, R9-2009-0080, BMPs may be "structural" (e.g., overhead coverage, retention ponds, control devices, secondary containment structures, and treatment) or "non-structural" (e.g., good housekeeping, preventive maintenance, material handling and storage, spill and leak response, onsite personnel training, waste handling/recycling, recordkeeping and internal reporting, erosion control and site stabilization, inspections, and quality assurance). Beginning in 1997 numerical effluent limitations for oil and grease, settleable solids, turbidity, pH, and temperature were established in the NPDES requirements for certain discharges (e.g. Non-Contact Cooling Water; Miscellaneous Low Volume Water, and Fire Protection Water).

In 1992, BAE Systems obtained coverage under the State Water Board's 1991 General Industrial NPDES Requirements for storm water discharges. These NPDES requirements supplemented BAE Systems NPDES requirements listed in Table 3-2. The industrial storm water NPDES requirements applied specifically to discharges of pollutants through storm water, while the NPDES requirements listed in Table 3-2 applied to other discharges. A listing of the General Industrial NPDES Requirements for storm water discharges adopted by the State Water Board in effect at the time the facility was owned and operated by Southwest Marine, Inc. and its successor, BAE Systems, is provided in Table 3-3 below.

Table 3-3 Southwest Marine/BAE Systems NPDES Permits

Order Number/ NPDES No.	Order Title	Adoption Date	Expiration Date
Order No. 91-13-DWQ, Industrial NPDES No. CAS000001	Waste Discharge Requirements (WDRs) For Discharge Of Storm Water Associated With Industrial Activities Excluding Construction Activities	(Notice of Intent Filed) November 4, 1992	(Notice of Termination Approved) June 31, 1999
Order No. 97-03-DWQ, Industrial NPDES No. CAS000001	Waste Discharge Requirements (WDRs) For Discharge Of Storm Water Associated With Industrial Activities Excluding Construction Activities	(Notice of Intent Filed) June 31, 1999	(Notice of Termination Approved) July 29, 1999

The General Industrial NPDES Requirements for storm water discharges required BAE Systems to develop and implement plans to limit its discharges of pollutants from storm water runoff into San Diego Bay. Rather than relying on specific numerical effluent limitations, the NPDES requirements directed BAE Systems to create and follow "Best Management Practices" (BMPs). The General Industrial NPDES Requirements for storm water discharges also required BAE Systems to develop and implement a Storm Water Pollution Prevention Plan (SWPPP) and a Storm Water Pollution Monitoring Plan (SWPMP). The requirements specified that the SWPPP be required to include, among other things, the following:

[39] Best management practices ("BMPs") means schedules of activities, prohibitions of maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

- Descriptions of sources that might add significant quantities of pollutants to storm water discharges;
- A detailed site map;
- Descriptions of materials that had been treated, stored, spilled, disposed of, or leaked into storm water discharges since November 1988;
- Descriptions of the management practices that were employed to minimize contact between storm water and pollutants from vehicles, equipment, and materials;
- Descriptions of existing structural and non-structural measures to reduce pollutants in storm water discharges;
- Descriptions of methods of on-site storage and disposal of significant materials;
- Descriptions of outdoor storage, manufacturing, and processing activities;
- A list of pollutants likely to be present in significant quantities in storm water discharges and an estimate of the annual amounts of those pollutants in storm water discharge;
- Records of significant leaks or spills of toxic or hazardous pollutants to storm water;
- Summary of existing data describing pollutants in storm water discharge;
- Descriptions of storm water management controls, including good housekeeping procedures, preventive maintenance, and measures to control and treat polluted storm water; and
- A list of the specific individuals responsible for developing and implementing the SWPPP.

3.5.2. Order No. 79-74, Shipyard NPDES Permit No. CA0107697

Order No. 79-74, Shipyard NPDES Permit No. CA0107697 was in effect from November 26, 1979 to April 18, 1983, and contained the following requirement that relates to the discussions contained herein:

- B. PROVISIONS … 3. The discharger shall comply with Monitoring and Reporting Program No. 79-74 as contained in this Order or as modified by the Executive Officer. Within 30 days of the adoption of this Order, the discharger shall submit, in writing, the name of the person authorized to sign the monitoring reports in accordance with the attached "General Monitoring and Reporting Provisions." In accord with the provisions of section 13267(b) of the ~~CWC~~Water Code, the monitoring reports shall be submitted under penalty of perjury.

3.5.3. Order No. 83-11, Shipyard NPDES Permit No. CA0107697

Order No. 83-11, Shipyard NPDES Permit No. CA0107697 was in effect from April 18, 1983 to October 15, 1997, and contained the following requirements that relate to the discussions contained herein:

- A. PROHIBITIONS … 2. The deposition or discharge of refuse, rubbish, materials of petroleum origin, spent abrasives (including old primer and antifouling paint), paint, paint chips, or marine fouling organisms into San Diego Bay or at any place where they would be eventually transported to San Diego Bay is prohibited;

- B. DISCHARGE SPECIFICATIONS … 2. Effluent discharged to San Diego Bay must be essentially free of: (a) Material that is floatable or will become floatable upon discharge. (b) Settleable material or substances that form sediments which degrade benthic communities or other aquatic life. (c) Substances toxic to marine life due to increases in concentrations in marine waters or sediments;

- B. DISCHARGE SPECIFICATIONS … 3. The discharger shall comply with the Water Pollution Control Plan described in Finding No. 9. Any proposed amendment to the Water Pollution Control Plan must be approved in writing by the Executive Officer.

  Finding 9 states the following: The Water Pollution Control Plan by BAE Systems identifies the following measures to be taken for the control of pollutants: A. Demolition Activities (1) Quay wall (a) Structures will be removed from the land and debris removed to an approved disposal site as it accumulates. (b) Excavation behind the existing quay wall will be done before the sheet piles are pulled. The sheet piles will act as a curtain to prevent debris resulting from demolition activities from entering the bay. (c) Excavation material not to be replaced and compacted will be removed from the site. Thus, excavation material will not be available to be carried into the bay by any rain runoff. (2) Buildings (a) Buildings will be emptied of all furnishings prior to demolition. (b) Building debris and concrete foundations will be removed from the yard as demolition proceeds. (3) Piers (a) Piers will be cleared of debris and broom-cleaned prior to deck demolition. (b) Pier decks will be removed by SWM. No deck material will be dumped into the bay. (c) Piles will be pulled and disposed of on land. B. Construction Activities (1) Pier Replacement (a) Piles will be precast off the yard with no surplus concrete allowed within the construction area. (b) Care will be taken while casting pile caps and cast-in-place sections of the deck to prevent spillage into the bay. (c) Extensive use of precast deck will be made to minimize the pouring of concrete over the water. (d) Deck fittings and utility anchorages will use either bolt-through-connections or cast-in-place anchors. No coring or drilling for anchors will be done. This will eliminate concrete chips and dust. (2) Quay wall (a) Sheet piling will be driven prior to any backfilling to prevent fill materials from entering the bay. (b) Care will be taken while pouring the quay wall pile cap to prevent concrete spillage into bay. (c) After compaction and grading, exposed areas will be protected with Asphaltic Concrete paving to prevent soil from entering the bay. (3) Shore Improvements (a)

Excavation for foundations will be minimized. Excavation material will be removed by the Contractor as work progresses in order to prevent their materials from entering the bay. (b) Slopes will be protected from runoff by Asphaltic Concrete paving. (4) Miscellaneous (a) All parking lots will, as part of their improvement, be paved. (b) Concrete spillage will be removed by the contractor. Concrete delivered in excess of that required for a given pour will not be disposed of on the yard. C. Marine Railways (1) Sump areas and waste dams will be cleaned out manually. Cleaning will be done as necessary when a ship is being worked on. (2) Work areas adjacent to the railways will be swept broom-clean as necessary when a ship is being worked on. (3) Material removed from sump areas, and dams will be removed by truck by a contract waste removal service or by BAE Systems. D. Dry docks (1) Sandblast curtains will be rigged prior to conducting sandblasting. (2) After work is complete and prior to dry dock flooding, the dry dock floor will be swept broom-clean. (3) The waste (usually sandblast grit, trash, scale, rust, paint chips, and removed marine organisms) will be transferred to trucks and removed by a contract waste removal service or BAE Systems and disposed of at a dumpsite approved by the San Diego Water Board Executive Officer. E. Piers (1) Separate containers for trash, garbage, and metal scrap are located on all piers. (2) Piers will be swept broom-clean, as necessary. F. Transfer Platforms (1) Shore platforms, transfer carriages, and work areas adjacent to the platforms will be swept broom-clean as necessary when a ship is being worked on. (2) Sandblast curtains will be rigged prior to conducting sandblasting. (3) Waste (usually sandblast grit, trash, scale, rust, paint chips, and removed marine organisms) will be transferred to trucks and removed by a contract waste removal service or BAE Systems and disposed of at a dumpsite approved by the San Diego Water Board Executive Officer. G. Open Work Areas (1) Open work areas will be swept broom-clean as necessary. (2) Containers for waste are located at all open work areas. H. Accidental Spills Accidental spills could result in the release of oil, fuel, coolants, paint, and sandblast material. Emergency response procedures for liquid spills on land or on water are contracted with Cleaning Dynamics Corporation (approximately three blocks from BAE Systems). Minor liquid spills on land and sandblast material spills would be cleaned by BAE Systems;

- C. RECEIVING WATER LIMITATIONS. BAE Systems discharge shall not cause violation of the following water quality objectives in San Diego Bay: "…5. Toxicity (a) All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life…;" and

- Prohibitions in the Basin Plan were also applicable to Order No. 83-11, NPDES Permit No. CA0107697 and were summarized in Finding 15 as follows: The Basin Plan established the following prohibitions which are applicable to the discharge:

  "The dumping or deposition from shore or from vessels of oil, garbage, trash or other solid municipal, industrial or agricultural waste directly into waters subject to tidal action or adjacent to waters subject to tidal action in any manner which may permit it to be washed into the waters subject to tidal action is prohibited.

"The discharge of municipal and industrial waste sludge and sludge digester supernatant directly to the ocean or into a waste stream that discharges to the ocean without further treatment, is prohibited.

"The discharge of sewage from shore or vessels into the waters of San Diego Bay, Mission Bay, or small boat harbors is prohibited.

"Discharge of industrial wastewaters exclusive of cooling water, clear brine or other waters which are essentially chemically unchanged, into waters subject to tidal action is prohibited.

"The dumping or deposition of chemical wastes, chemical agents or explosives into waters subject to tidal action is prohibited."

3.5.4. Order No. 97-36, Shipyard NPDES Permit No. CAG039001

Order No. 97-36, Shipyard NPDES Permit No. CAG039001, was in effect from October 15, 1997 to November 13, 2002 and contained the following requirements that relate to the discussions contained herein:

- A. PROHIBITIONS … 2. The discharge of sewage (except as noted in the Basin Plan Waste Discharge Prohibitions) to San Diego Bay is prohibited;

- A. PROHIBITIONS … 5. The discharge of rubbish, refuse, debris, materials of petroleum origin (other than ship launch grease / wax) waste zinc plates, abrasives, primer, paint, paint chips, solvents, and marine fouling organisms, and the deposition of such wastes at any place where they could eventually be discharged is prohibited. This pollution does not apply to the discharge of marine fouling organisms removed from unpainted, uncoated surfaces by underwater operations (see Prohibition 11). (Rubbish and refuse include any cans, bottles, paper, plastic, vegetable matter, or dead animals or dead fish deposited or caused to be deposited by man.);

- A. PROHIBITIONS … 8. Discharges of wastes and pollutants identified in Finding 2.a.i through 2.a.ix of this Order are prohibited. Discharges of wastes and pollutants not specifically identified in Finding 2.b through 2.e of this Order are prohibited.

  Finding 2 states the following: "FINDING 2. a. Ship construction, modification, repair, and maintenance activities result or have the potential to result in discharges to San Diego Bay of wastes and pollutants which are likely to cause or threaten to cause pollution, contamination, or nuisance; adversely impact human health or the environment; cause or contribute to violation of an applicable water quality objective; and/or otherwise adversely affect the quality and/or beneficial uses of waters of the state and waters of the United States. Such discharges include: i. water contaminated with abrasive blast materials, paint, oils, fuels, lubricants, solvents, or petroleum; ii. hydroblast water; iii. tank cleaning water from tank cleaning to remove sludge and/or dirt; iv. clarified water from oil/water separation; v. steam cleaning water; vi. demineralizer / reverse osmosis brine; vii. floating dry dock sump water when the dry dock is in use as a work area or when the dry dock is not in use as a work area but before the sump has been purged following such use; viii. oily bilge water; ix. contaminated ballast water; and x. the first flush of storm water runoff from high risk areas. b. Ship construction, modification, repair, and maintenance activities also result or have the potential to result in discharges to San Diego Bay of wastes and pollutants which pose less threat than those identified in Finding 2.a above. Such discharge included: i. vessel washdown water; ii. floating dry dock submergence/emergence water; iii. graving dock flood water; iv. graving dock sump pump test water; v. shipbuilding ways flood water; vi. floating dry dock sump water when the dry dock is not in use as a work area after the sump has been purged following such use; vii. pipe and tank hydrostatic test water; viii. graving dock gate and wall leakage water; ix. shipbuilding ways gate and wall leakage and hydrostatic relief water; x. miscellaneous low-volume water; and xi. storm water runoff other than the first flush of storm water runoff from high risk areas.;"

- B. DISCHARGE SPECIFICATIONS … 5. Waste discharged shall be essentially free of: "…b. Settleable material or substances that may form sediments which will degrade benthic communities or other aquatic life. c. Substances which will accumulate to toxic levels in marine waters, sediments, or biota. …;" and
- C. RECEIVING WATER LIMITATIONS. Discharges shall not cause or contribute to violation of the following receiving water limitations: 1. There shall be no adverse impact on human health or the environment. 2. There shall be no impairment of any beneficial use or violations of the applicable Basin Plan Water Quality Objectives (Attachment C) or any applicable state Water Quality Control Plan or Policy. 3. Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. 4. Natural light shall not be significantly reduced as the result of the discharge of waste. 5. The rate of deposition of inert solids and the characteristics of inert solids in sediments shall not be changed such that benthic communities are degraded. 6. The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions. 7. The concentration of substances in marine sediments shall not be increased to levels that would degrade indigenous biota. 8. The concentration of organic materials in sediment shall not be increased to levels that would degrade marine life. 9. Substances shall not be present in the water column, sediments, or biota at concentrations that adversely affect beneficial uses or which will bioaccumulate to levels that are harmful to aquatic organisms, wildlife, or human health. 10. The daily maximum chronic toxicity of waters of the United States shall not exceed 1 Toxic Unit Chronic (TUc), as determined using a standard test species and protocol approved by the Executive Officer.

3.5.5. Order No. R9-2002-0161, Shipyard NPDES Permit No. CA0109151

Order No. R9-2002-0161, Shipyard NPDES Permit No. CA0109151, in effect from November 13, 2002 to present, contains the following requirements that relate to the discussions contained herein:

- A. PROHIBITIONS … 6. The discharge of rubbish, refuse, debris, materials of petroleum origin, waste zinc plates, abrasives, primer, paint, paint chips, solvents, and marine fouling organisms, and the deposition of such wastes at any place where they could eventually be discharged is prohibited. This prohibition does not apply to the discharge of marine fouling organisms removed from unpainted, uncoated surfaces by underwater operations and discharges that result from cleaning of floating booms that were installed for 'Force Protection' purposes (see Prohibition 10). (Rubbish and refuse include any cans, bottles, paper, plastic, vegetable matter, or dead animals deposited or caused to be deposited by man.);

- A. PROHIBITIONS … 8. The discharge or bypassing of untreated waste to San Diego Bay is prohibited. (This prohibition does not apply to non-contact cooling water, miscellaneous low volume water, and fire protection water streams which comply with the requirements of this Order for elevated temperature waste discharges and which do not contain pollutants or waste other than heat.) ; and

- B. DISCHARGE SPECIFICATIONS … 4. The following acute toxicity effluent limit applies to Undiluted storm water discharges to San Diego Bay, that are associated with industrial activity: Acute toxicity: In a 96-hour static or continuous flow bioassay test, the discharge shall not produce less than 90 percent survival, 50 percent of the time, and not less than 70 percent survival, 10 percent of the time, using a standard test species and protocol approved by the San Diego Water Board.

- B. DISCHARGE SPECIFICATIONS … 9. Waste discharges shall be essentially free of: b. Settleable material or substances that may form sediments which will degrade benthic communities or other aquatic life. c. Substances which will accumulate to toxic levels in marine waters, sediments, or biota; and

- C. RECEIVING WATER LIMITATIONS. Discharges shall not cause or contribute to violation of the following receiving water limitations: 1. There shall be no adverse impact on human health or the environment. 2. There shall be no impairment of any beneficial use or violations of the applicable Basin Plan Water Quality Objectives (Attachment C) or any applicable state Water Quality Control Plan or Policy. 3. Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. 4. Natural light shall not be significantly reduced as the result of the discharge of waste. 5. The rate of deposition of inert solids and the characteristics of inert solids in sediments shall not be changed such that benthic communities are degraded. 6. The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions. 7. The concentration of substances in marine sediments shall not be increased to levels that would degrade indigenous biota. 8. The concentration of organic materials in sediment shall not be increased to levels that would degrade marine life. 9. Substances shall not be present in the water column, sediments, or biota at concentrations that adversely affect beneficial uses or which will bioaccumulate to levels that are harmful to aquatic organisms, wildlife, or human health.

3.5.6. Order No. 91-13-DWQ, NPDES Permit No. CAS000001, General Industrial NPDES Requirements for Storm Water Discharges

Order No. 91-13-DWQ, NPDES Permit No. CAS000001, in effect from November 4, 1992 to February 5, 1998 contained the following key narrative limitations that relate to the discussions contained herein:

- A. DISCHARGE PROHIBITIONS: … 3. Storm water discharges shall not cause or threaten to cause pollution, contamination, or nuisance; and
- B. RECEIVING WATER LIMITATIONS. … 1. Storm water discharges to any surface or ground water shall not adversely impact human health or the environment.

3.6. BAE Systems' Waste Discharges

BAE Systems has discharged or deposited waste where it was discharged into San Diego Bay creating, or threatening to create, a condition of pollution or nuisance.

BAE Systems discharges are documented in the San Diego Water Board records via discharger monitoring and spill reports (filed by BAE Systems predecessor Southwest Marine), citizen complaints, San Diego Water Board inspection reports, and San Diego Water Board Notices of Violation issued to BAE Systems. These discharges are itemized in Tables 3-4 through 3-7, below.

Table 3-4 BAE Systems' Discharges from 1979 to 1983

Date	Description	Technical Report Reference[1]	Source	Citation[2]
April 16, 1981	Dumping spent abrasive grit waste to a landfill without prior approval of San Diego Water Board Executive Officer.	Section 3.4	Notice of Violation	Order No. 79-74, B. Provisions 3

1. Reference to Section 3.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 3.4.
2. The cited waste discharge requirement(s) can be found in Section 3.5 of this Technical Report.

Table 3-5 BAE Systems' Discharges from 1983 to 1997

Date	Description	Technical Report Reference[1]	Source	Citation[2]
February 25, 1986	Discharge of turbid runoff water to San Diego Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
October 30, 1986	Discharge of cooling water carrying sand and other floatables to San Diego Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
May 5, 1987	Elevated levels of zinc, copper and chromium in blast grit discharge sampled during 3/18/1987 RWQCB inspections.	Section 3.4	Notice of Violation	Order No. 83-11, A. Prohibitions 2 and B. Discharge Specifications 2
March 2, 1988	Discharge of abrasive blast waste to San Diego Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
October 26, 1988	Discharge of steam cleaning waste to San Diego Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
November 9, 1988	Discharge of abrasive blast waste and sewage to San Diego Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
November 15, 1988	Discharge of abrasive blast waste and sewage to San Diego Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
November 23, 1988	Discharge of sewage to San Diego Bay.	Section 3.4	Spill Report	Order No. 83-11, A. Prohibitions 2
February 27, 1989	Sample collected near marine railway contained hazardous levels of copper (6,690 mg/kg) and zinc (5,010 mg/kg) found in area where it could be washed in to San Diego Bay due to storm runoff.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
May 31, 1989	Discharge of abrasive blast waste from Marine Railway to San Diego Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
August 14, 1989	Discharge of abrasive blast waste from large floating dry dock to San Diego Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
August 15, 1989	Discharge of abrasive blast waste from small floating dry dock to San Diego Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
August 16, 1989	Discharge of abrasive blast waste from small floating dry dock to San Diego Bay. Sample contained 3,635 mg/kg copper.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
August 17, 1989	Discharge of 10 to 20 gallons of diesel to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
October 12, 1989	Discharge approximately 1 gallon of paint overspray to San Diego Bay.	Section 3.4	Spill Report/ Complaint	Order No. 83-11, A. Prohibitions 2
November 15, 1989	Discharge of sewage overflow to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
December 8, 1989	Discharge 5 gallons of paint to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
December 8, 1989	Discharge 5 gallons of solvent to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2

Date	Description	Technical Report Reference[1]	Source	Citation[2]
December 8, 1989	50 gallons of oil spilled. Unknown quantity discharged into the storm drain and to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
December 12, 1990	Discharge of small amount of oil to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
January 7, 1991	Discharge of abrasive blast and paint waste to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
January 8, 1991	Discharge of 15 gallons of bilge waste oil to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
February 1, 1991	Discharge of 1 gallon of a mixture of oily and soapy liquid to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
June 18, 1992	Deposit of abrasive blast waste where it will probably be discharged to Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, B. Discharge Specifications 3/ Finding 9
June 18, 1992	Deposit of sand and grit waste where it will probably be discharged to Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, B. Discharge Specifications 3/Finding 9
June 18, 1992	Anchor chain blasting barge without containment BMPs.	Section 3.4	RWQCB Inspection	Order No. 83-11, B. Discharge Specifications 3/Finding 9
June 18, 1992	Deposit of abrasive blast waste on marine railway where it will probably be discharged to Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2
October 20, 1992	Discharge of abrasive blast waste to San Diego Bay.	Section 3.4	Anonymous Spill Report	Order No. 83-11, A. Prohibitions 2
February 19, 1993	Discharge of 5 gallons of oil waste to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
March 18, 1993	Discharge of unknown quantity of oil to San Diego Bay	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
March 19, 1993	Discharge of 1 gallon of oil to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
September 15, 1993	Discharge of 30 to 50 gallons of lube oil to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
September 20, 1993	Discharge of 5 gallons of diesel fuel to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
November 17, 1993	Large hole on the anchor chain barge allowing blast grit to spread to open end of barge.	Section 3.4	RWQCB Inspection	Order No. 83-11, B. Discharge Specifications 3/Finding 9
October 13, 1994	Deposit of abrasive blast waste where it will probably be discharged to Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, A. Prohibitions 2

Date	Description	Technical Report Reference[1]	Source	Citation[2]
June 16, 1995	Deposit of debris and other substances in storm drains where it will probably be discharged to Bay.	Section 3.4	RWQCB Inspection	Order No. 83-11, B. Discharge Specifications 3/Finding 9
June 16, 1995	Sump needs cleaning of observed contaminated soil. Rain occurred the night before and discharge valve is open.	Section 3.4	RWQCB Inspection	Order No. 83-11, B. Discharge Specifications 3/Finding 9
September 29, 1996	Discharge of 3 gallons of oil to San Diego Bay.	Section 3.4	USCG Spill Report	Order No. 83-11, A. Prohibitions 2
February 18, 1997	Discharge of less than ½ gallon of CHT - sewage to Bay.	Section 3.4	BAE Spill Report	Order No. 83-11, Basin Plan Prohibitions / Finding 15
May 1, 1997	Discharge of abrasive blast waste to Bay.	Section 3.4	BAE Spill Report	Order No. 83-11, A. Prohibitions 2

1. Reference to Section 3.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 3.4.
2. The cited waste discharge requirement(s) can be found in Section 3.5 of this Technical Report.

Table 3-6 BAE Systems' Discharges from 1997 to 2002

Date	Description	Technical Report Reference[1]	Source	Citation[2]
March 17, 1998	Discharge of 20 ounces of Betadine solution to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
March 18, 1998	Discharge of unknown quantity of fuel to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
March 20, 1998	Discharge of less than 1 gallon of paint overspray to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
May 8, 1998	Discharge of 20 gallons of CHT – sewage to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 2
May 9, 1998	Discharge 60 gallons of hydroblast/ballast water to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
July 23, 1998	Discharge of 0.025 gallons of paint spray from ruptured hose to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
October 8, 1998	Discharge of 10 gallons of diesel/water mix to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
October 9, 1998	Discharge of ¼ gallon of diesel/water mix to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
November 25, 1998	Discharge of unknown quantity of dust film to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8

Date	Description	Technical Report Reference[1]	Source	Citation[2]
December 8, 1998	Discharge of a 50' x 5' film of dust to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
December 13, 1998	Discharge of a 75' x 25' film of abrasive blast waste dust to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
January 22, 1999	Discharge of approximately 15 gallons of basin wash down wastewater to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
March 10, 1999	Discharge of approximately 4,320 gallons of sewage to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 2
March 11, 1999	Discharge of approximately 1 gallon of diesel to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
March 26, 1999	Discharge of unknown quantity of sewage to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 2
March 26, 1999	Discharge of a 50' x 50' film of dust to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
March 30, 1999	Discharge of a 5' x 5' film of paint overspray to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
April 7, 1999	Discharge of a 2' x 3' film of paint overspray to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
April 8, 1999	Discharge of approximately 35 gallons of dry dock wash wastewater to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
April 12, 1999	Discharge of a 10' x 30' film of diesel to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
April 13, 1999	Discharge of less than 100 gallons of pressure wash waster to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
April 14, 1999	Discharge of ½ gallon of liquid degreaser to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
April 14, 1999	Discharge of a 10' x 20' film of paint overspray to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
April 22, 1999	Discharge of unknown quantity of petroleum product to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
April 28, 1999	Discharge of 2.5 gallons oily water to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
May 2, 1999	Discharge of less than 5 gallons diesel to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
May 7, 1999	Discharge of 1 gallon of petroleum product to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
May 13, 1999	Discharge of unknown quantity of a yellow petroleum substance to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
May 16, 1999	Discharge of an unknown quantity of dust and fine debris to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
May 28, 1999	Discharge of less than 0.25 gallons of hydraulic oil to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5

Date	Description	Technical Report Reference[1]	Source	Citation[2]
March 30, 1999	Discharge of 5' x 5' film of paint to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
June 1, 1999	Discharge of 1 gallon of pressure wash wastewater to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
August 5, 1999	Discharge of 5 gallons of diesel to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
October 5, 1999	Discharge of 1 gallon of diesel to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
October 8, 1999	Discharge of less than 10 gallons of diesel to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
February 20, 2000	Discharge of less than 5 gallons of CHT – sewage to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 2
April 6, 2000	Discharge of 200 gallons of CHT – sewage to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 2
April 28, 2000	Discharge of 200 gallons of CHT – sewage to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 2
May 1, 2000	Discharge of ½ gallon of water-based paint to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
September 22, 2000	Discharge of 50 gallons of JP -5 to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
October 29, 2000	Discharge of ½ ounce of diesel fuel to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
November 2, 2000	Discharge of a 5'x 8' sheen of paint chips to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
November 20, 2000	Discharge of 5 gallons of abrasive blast waste to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
December 5, 2000	Discharge of less than one gallon of abrasive blast waste to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
December 11, 2000	Discharge of a 20' x 20' film of paint to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
December 12, 2000	Discharge of < 5 gallons abrasive blast waste to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
January 29, 2001	Discharge of ½ gallon of hydraulic fluid to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
April 2, 2001	Discharge of 3 to 5 gallons of unknown fuel product to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
April 26, 2001	Discharge of about 1 ounce of water, waste paint, and thinner to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
October 15, 2001	Discharge of 1,275 gallons of CHT – non-contact cooling water to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 2
October 16, 2001	Discharge of a 15' x 10' film of abrasive dust to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8

Date	Description	Technical Report Reference[1]	Source	Citation[2]
October 20, 2001	Discharge of less than 1 gallon of oil to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
November 2, 2001	Discharge 1 gallon of JP 5 to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
April 9, 2002	Discharge of 2 pints of engine oil to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 5
September 25, 2002	Discharge of less than 5 gallons of unknown liquid to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8
November 12, 2002	Discharge of less than 5 gallons of abrasive blast waste dust to Bay.	Section 3.4	BAE Spill Report	Order No. 97-36, A. Prohibitions 8

1. Reference to Section 3.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 3.4.
2. The cited waste discharge requirement(s) can be found in Section 3.5 of this Technical Report.

Table 3-7 BAE Systems' Discharges from 2002 to 2005

Date	Description	Technical Report Reference[1]	Source	Citation[2]
November 25, 2002	Discharge of approximately 5 gallons of AFFF (aqueous film forming foam) to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 8
January 6, 2003	Discharge less than 1 gallon of diesel to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
January 23, 2003	Discharge of 750 gallons of AFFF to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 8
January 24, 2003	Discharge of less than 1 gallon of diesel to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
March 4, 2003	Discharge of less than 1 gallon of diesel to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
March 13, 2003	Discharge of less than 1 gallon of oil to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
September 23, 2003	Discharge of 1 gallon of petroleum to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
October 1, 2003	Discharge of 1 cup of hydraulic oil to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6

Date	Description	Technical Report Reference[1]	Source	Citation[2]
October 3, 2003	Discharge of less than 1 gallon of hydraulic oil to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
October 9, 2003	Discharge of 10 gallons of mopping wastewater to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 8
October 17, 2003	Discharge of unknown quantity of oily product to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
October 29, 2003	Discharge of unknown quantity of oily product to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
November 4, 2003	Discharge of less than 1 gallon of water and grit to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 8
December 2, 2003	Discharge of more than 1000 gallons of dry dock wash down wastewater to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 8
December 16, 2003	Discharge of unknown quantity of ash to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 8
January 14, 2004	Discharge of unknown quantity of oil and particulates to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
January 19, 2004	Discharge of 10 gallons of soapy water to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 8
February 5, 2004	Discharge of a trickle of hydroblast wastewater to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 8
February 19, 2004	Discharge of 5 gallons of liquid from “flammable” marked bucket to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
February 25, 2004	Discharge of 100 gallons of rust colored water to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
March 19, 2004	Discharge of unknown quantity of dust to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 8
March 19, 2004	Discharge of less than 1 quart of DFM to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 8
May 12, 2004	Discharge of 10’ x 30’ overspray of paint to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6

Date	Description	Technical Report Reference[1]	Source	Citation[2]
May 21, 2004	Discharge of 2 lbs. of abrasive blast waste to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
September 9, 2004	Discharges of 10 gallons of soapy water and trickle of hydroblast water spilled to Bay on January 19, 2004 and February 5, 2004 (respectively).	Section 3.4	Notice of Violation	Order No. R9-2002-0161, A. Prohibitions 8
September 9, 2004	Discharges of 10' x 30 area of paint overspray and approximately two lbs of abrasive blast waste dust spilled to Bay on May 12, 2004 and May 21, 2004 (respectively).	Section 3.4	Notice of Violation	Order No. R9-2002-0161, A. Prohibitions 6
December 7, 2004	Discharge of less than 1 ounce of petroleum product to Bay.	Section 3.4	BAE Spill Report	Order No. R9-2002-0161, A. Prohibitions 6
March 21, 2005	Discharge of 2,487 gallons of storm water spilled to Bay with 85% toxicity survival not meeting 90% toxicity survival on February 26, 2004.	Section 3.4	Notice of Violation	Order No. R9-2002-0161, B. Discharge Specifications 4

1. Reference to Section 3.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 3.4.
2. The cited waste discharge requirement(s) can be found in Section 3.5 of this Technical Report.

3.7. Storm Water Monitoring for Shipyard NPDES Requirements

Since 1983, BAE Systems' NPDES Permits have included Discharge Specifications and Receiving Water Limitations that have set a narrative limit on discharge pollutant concentrations with intent to reduce or eliminate toxic chemical concentrations in marine water, marine life, and sediment.

While operating under various Shipyard NPDES Permits, BAE Systems has discharged constituents at levels that are elevated compared to levels established by the CTR for saltwater.[40] The U.S. EPA finalized the CTR on May 18, 2000. None of the numerical values in CTR were included as numerical effluent limitations in any of the NPDES Permits issued to BAE Systems. However, the numerical values in the CTR represent the latest, most up-to-date numerical thresholds for use in determining whether a chemical concentration in a water body is detrimental to its beneficial uses. By comparing CTR values with pollutant levels in historical discharges, the San Diego Water Board is able to determine which discharges may have contributed to toxic chemical concentrations in marine water, marine life and sediment at the Shipyard Sediment Site in the past. Also, where there are historical discharges elevated above CTR values, there exists an elevated probability that those same discharges contributed to the

[40] The California Toxics Rule (CTR) was finalized by the U.S. EPA in the Federal Register (65 Fed. Register 31682-31719), adding Section 131.38 to Title 40 of the Code of Federal Regulations on May 18, 2000. The full text of the CTR is available at the following web address: http://www.epa.gov/OST/standards/ctrindex.html.

present condition of pollution. In retrospect, to the extent that those historical, elevated discharges did cause toxic chemical concentrations in marine water, marine life, and sediment, and/or did contribute to the present condition of pollution at the Shipyard Sediment Site, there exists an NPDES violation.

While BAE Systems' various Shipyard NPDES Requirements[41] did not provide specific numerical limitations for all possible chemicals, the San Diego Water Board did require that discharges from BAE not cause a violation of the key requirements, described in Section 3.5, above. Monitoring reports submitted by BAE Systems during the years 1987 through 1989, 2000, and 2002 through 2004 indicate that elevated levels of arsenic, cadmium, chromium, copper, lead, nickel, and zinc were present in storm water discharged from the BAE Systems site to San Diego Bay. Specific discharges are presented in Tables 3-8 through 3-10 below.

Table 3-8 Discharge Samples above CTR Values Occurring from 1983 to 1997

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 18, 1987	Arsenic	0.54 mg/L	0.036 mg/L	Section 3.4	Dry dock Sample	San Diego Water Board Sample Report	Order No. 83-11, B. Discharge Specifications 2 and C. Receiving Water Limitations 5(a)
March 18, 1987	Cadmium	0.05 mg/L	0.0093 mg/L	Section 3.4	Dry dock Sample	San Diego Water Board Sample Report	Order No. 83-11, B. Discharge Specifications 2 and C. Receiving Water Limitations 5(a)
March 18, 1987	Chromium	7.5 mg/L	0.05 mg/L	Section 3.4	Dry dock Sample	San Diego Water Board Sample Report	Order No. 83-11, B. Discharge Specifications 2 and C. Receiving Water Limitations 5(a)
March 18, 1987	Copper	85 mg/L	0.0031 mg/L	Section 3.4	Dry dock Sample	San Diego Water Board Sample Report	Order No. 83-11, B. Discharge Specifications 2 and C. Receiving Water Limitations 5(a)
March 18, 1987	Lead	1.8 mg/L	0.0081 mg/L	Section 3.4	Dry dock Sample	San Diego Water Board Sample Report	Order No. 83-11, B. Discharge Specifications 2 and C. Receiving Water Limitations 5(a)
March 18, 1987	Nickel	1.5 mg/L	0.0082 mg/L	Section 3.4	Dry dock Sample	San Diego Water Board Sample Report	Order No. 83-11, B. Discharge Specifications 2 and C. Receiving Water Limitations 5(a)

41 Order No. 83-11, Shipyard NPDES No. CAO107697, Order No. 97-36, Shipyard NPDES Permit No. CAG039001, and Order No. R9-2002-0161, Shipyard NPDES Permit No. CA0109151

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 18, 1987	Zinc	2000 mg/L	0.081 mg/L	Section 3.4	Dry dock Sample	San Diego Water Board Sample Report	Order No. 83-11, B. Discharge Specifications 2 and C. Receiving Water Limitations 5(a)

1. 40 CFR 131.38
2. Reference to Section 3.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 3.4.
3. The cited waste discharge requirement(s) can be found in Section 3.5 of this Technical Report.

Table 3-9 Discharge Samples above CTR Values Occurring from 1997 to 2002

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 12, 2000	Copper	0.553 mg/L	0.0031 mg/L	Section 3.4	Storm Water Discharge Pier 1	Southwest Marine (SWM) Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10
February 12, 2000	Copper	0.0955 mg/L	0.0031 mg/L	Section 3.4	Storm Water Discharge Pier 3	SWM Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10
February 12, 2000	Lead	0.0384 mg/L	0.0081 mg/L	Section 3.4	Storm Water	SWM Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10
February 12, 2000	Nickel	0.0189 mg/L	0.0082 mg/L	Section 3.4	Storm Water	SWM Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10
February 12, 2000	Zinc	0.541 mg/L	0.081 mg/L	Section 3.4	Storm Water Discharge Pier 1	SWM Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 12, 2000	Zinc	0.0871 mg/L	0.081 mg/L	Section 3.4	Storm Water Discharge Pier 3	SWM Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10
March 5, 2000	Copper	0.238 mg/L	0.0031 mg/L	Section 3.4	Storm Water Discharge Pier 3	SWM Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10
March 5, 2000	Lead	0.015 mg/L	0.0081 mg/L	Section 3.4	Storm Water Discharge Pier 1	SWM Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10
March 5, 2000	Zinc	0.333 mg/L	0.081 mg/L	Section 3.4	Storm Water Discharge Pier 3	SWM Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10
March 26, 2002	Copper	0.014 mg/L	0.0031 mg/L	Section 3.4	Non-Contact Cooling Water	SWM Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10
March 26, 2002	Copper	0.017 mg/L	0.0031 mg/L	Section 3.4	Fire Protection Water	SWM Monitoring Report	Order No. 97-36, B. Discharge Specifications 5b and 5c, and C. Receiving Water Limitations 1 through 10

1. 40 CFR 131.38
2. Reference to Section 3.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 3.4.
3. The cited waste discharge requirement(s) can be found in Section 3.5 of this Technical Report.

Table 3-10 Discharge Samples above CTR Values Occurring from 2002 to 2004

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 27, 2002	Copper	0.0163 mg/L	0.0031 mg/L	Section 3.4	Building 13	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
November 27, 2002	Copper	0.00934 mg/L	0.0031 mg/L	Section 3.4	Building 13	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
December 10, 2002	Copper	0.0153 mg/L	0.0031 mg/L	Section 3.4	Pier 1 Fire Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
December 10, 2002	Copper	0.00772 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
January 8, 2003	Copper	0.0159 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
January 10, 2003	Copper	0.0197 mg/L	0.0031 mg/L	Section 3.4	Pier 3 Fire Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
February 27, 2003	Copper	0.0104 mg/L	0.0031 mg/L	Section 3.4	Pier 3 Fire Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
February 27, 2003	Copper	0.0105 mg/L	0.0031 mg/L	Section 3.4	Pier 3 Fire Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 27, 2003	Copper	0.00947 mg/L	0.0031 mg/L	Section 3.4	Storm Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
February 27, 2003	Copper	0.00917 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 17, 2003	Copper	0.00835 mg/L	0.0031 mg/L	Section 3.4	Pier 3 Fire Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 17, 2003	Copper	0.00837 mg/L	0.0031 mg/L	Section 3.4	Pier 3 Fire Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 17, 2003	Copper	0.0066 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
March 17, 2003	Copper	0.00665 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 9, 2003	Copper	0.00954 mg/L	0.0031 mg/L	Section 3.4	Pier 3 Fire Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 9, 2003	Copper	0.00948 mg/L	0.0031 mg/L	Section 3.4	Pier 3 Fire Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
April 9, 2003	Copper	0.00673 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 9, 2003	Copper	0.00702 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 12, 2003	Copper	0.00853 mg/L	0.0031 mg/L	Section 3.4	Building 13 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 12, 2003	Copper	0.00759 mg/L	0.0031 mg/L	Section 3.4	Storm Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 12, 2003	Copper	0.00702 mg/L	0.0031 mg/L	Section 3.4	Storm Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
July 21, 2003	Copper	0.0097 mg/L	0.0031 mg/L	Section 3.4	Pier 3 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
July 21, 2003	Copper	0.00997 mg/L	0.0031 mg/L	Section 3.4	Pier 3 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
July 21, 2003	Copper	0.0252 mg/L	0.0031 mg/L	Section 3.4	Building 13 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
July 21, 2003	Copper	0.0254 mg/L	0.0031 mg/L	Section 3.4	Building 13 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
July 21, 2003	Copper	0.00849 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
July 21, 2003	Copper	0.00849 mg/L	0.0031 mg/L	Section 3.4	Storm Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
August 15, 2003	Copper	0.0113 mg/L	0.0031 mg/L	Section 3.4	Pier 1 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
August 15, 2003	Copper	0.0111 mg/L	0.0031 mg/L	Section 3.4	Pier 1 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
August 15, 2003	Copper	0.007 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
August 15, 2003	Copper	0.00593 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
October 17, 2003	Copper	0.00772 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
October 17, 2003	Copper	0.00985 mg/L	0.0031 mg/L	Section 3.4	Building 13 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
November 19, 2003	Copper	0.00632 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
November 19, 2003	Copper	0.00737 mg/L	0.0031 mg/L	Section 3.4	Building 13 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
January 14, 2004	Copper	0.00922 mg/L	0.0031 mg/L	Section 3.4	Storm Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
January 14, 2004	Copper	0.00589 mg/L	0.0031 mg/L	Section 3.4	Storm Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
January 14, 2004	Copper	0.0126 mg/L	0.0031 mg/L	Section 3.4	Storm Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
January 14, 2004	Copper	0.00844 mg/L	0.0031 mg/L	Section 3.4	Storm Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
February 18, 2004	Copper	0.00781 mg/L	0.0031 mg/L	Section 3.4	Pier 3 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 18, 2004	Copper	0.00491 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 22, 2004	Copper	0.00847 mg/L	0.0031 mg/L	Section 3.4	Building 13 Cooling Water	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
April 22, 2004	Copper	0.00863 mg/L	0.0031 mg/L	Section 3.4	Building 13 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 14, 2004	Copper	0.00591 mg/L	0.0031 mg/L	Section 3.4	Pier 1 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 14, 2004	Copper	0.0243 mg/L	0.0031 mg/L	Section 3.4	Pier 3 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9
May 14, 2004	Copper	0.0318 mg/L	0.0031 mg/L	Section 3.4	Building 13 Fire Pump	SWM Monitoring Report	Order No. R9-2002-0161, B. Discharge Specifications 9b and 9c, and C. Receiving Water Limitations 1 through 9

1. 40 CFR 131.38
2. Reference to Section 3.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 3.4.
3. The cited waste discharge requirement(s) can be found in Section 3.5 of this Technical Report.

3.8. Storm Water Monitoring for General Industrial NPDES Requirements for Storm Water Discharges

Since 1992, BAE Systems' General Industrial NPDES Requirements for Storm Water Discharges have included Discharge Prohibitions and Receiving Water Limitations that have set a narrative limit on discharge pollutant concentrations with intent to reduce or eliminate toxic chemical concentrations in marine water, marine life, and sediment.

While subject to regulation under the General Industrial NPDES Requirements for Storm Water Discharges, BAE Systems discharged pollutants at levels that are elevated compared to levels established by the CTR for saltwater.[42] The U.S. EPA finalized the CTR on May 18, 2000. None of the numerical values in the CTR were included as numerical effluent limitations in any of the Industrial NPDES Requirements issued to BAE Systems. However, the numerical values in the CTR represent the latest, most up-to-date numerical thresholds for use in determining whether a chemical concentration in a water body is detrimental to its beneficial uses. By comparing CTR values with pollutant levels in historical discharges, the San Diego Water Board is able to determine which discharges may have contributed to toxic chemical concentrations in marine water, marine life and sediment at the Shipyard Sediment Site in the past. Also, where there are historical discharges elevated above CTR values, there exists an elevated probability that those same discharges contributed to the present condition of pollution. To the extent that those historical, elevated discharges did cause toxic chemical concentrations in marine water, marine life, and sediment, and/or did contribute to the present condition of pollution at the Shipyard Sediment Site, such discharges may have constituted an Industrial NPDES requirement violation.

While BAE Systems' Industrial NPDES Requirements did not provide specific numerical limitations for all possible chemicals, the San Diego Water Board did require that discharges from BAE Systems not cause a violation of discharge prohibitions and receiving water limitations described in Section 3.5.6, above. Monitoring reports submitted by BAE Systems during the years 1992 through 1993 and 1996 through 1999, pursuant to the General Industrial NPDES Requirements for storm water discharges, indicate that elevated levels of chromium, copper, lead, nickel, and zinc were present in storm water discharged from the BAE Systems site when compared to levels established by the CTR for saltwater. Specific discharge violations are cited in Table 3-11, below.

42 The California Toxics Rule (CTR) was finalized by the U.S. EPA in the Federal Register (65 Fed. Register 31682-31719), adding Section 131.38 to Title 40 of the Code of Federal Regulations on May 18, 2000. The full text of the CTR is available at the following web address: http://www.epa.gov/OST/standards/ctrindex.html.

Table 3-11 Discharge Sample above CTR Value Occurring from 1992 to 1999

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
December 7, 1992	Chromium	0.34 mg/L	0.05 mg/L	Section 3.4	Unknown	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
December 7, 1992	Copper	0.37 mg/L	0.0031 mg/L	Section 3.4	Unknown	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
December 7, 1992	Lead	0.34 mg/L	0.0081 mg/L	Section 3.4	Unknown	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
December 7, 1992	Nickel	0.09 mg/L	0.0082 mg/L	Section 3.4	Unknown	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
December 7, 1992	Zinc	2.25 mg/L	0.081 mg/L	Section 3.4	Unknown	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1993	Cadmium	0.01 mg/L	0.0093 mg/L	Section 3.4	Discharge Point #4	Southwest Marine (SWM) 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1993	Chromium	0.22 mg/L	0.05 mg/L	Section 3.4	Discharge Point #1A	SWM 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1993	Chromium	0.17 mg/L	0.05 mg/L	Section 3.4	Discharge Point #4	SWM 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1993	Copper	1.97 mg/L	0.0031 mg/L	Section 3.4	Discharge Point #1A	SWM 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1993	Copper	0.77 mg/L	0.0031 mg/L	Section 3.4	Discharge Point #4	SWM 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

January 25, 1993	Lead	0.28 mg/L	0.0081 mg/L	Section 3.4	Discharge Point #1A	SWM 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1993	Lead	0.28 mg/L	0.0081 mg/L	Section 3.4	Discharge Point #4	SWM 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1993	Nickel	0.04 mg/L	0.0082 mg/L	Section 3.4	Discharge Point #4	SWM 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1993	Zinc	3.17 mg/L	0.081 mg/L	Section 3.4	Discharge Point #1A	SWM 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1993	Zinc	2.49 mg/L	0.081 mg/L	Section 3.4	Discharge Point #4	SWM 1992-1993 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 4, 1994	Chromium	0.07 mg/L	0.05 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 14, 1994	Chromium	0.07 mg/L	0.05 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 4, 1994	Copper	0.24 mg/L	0.0031 mg/L	Section 3.4	SW1	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 4, 1994	Copper	0.57 mg/L	0.0031 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 4, 1994	Lead	0.61 mg/L	0.0081 mg/L	Section 3.4	SW1	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 4, 1994	Lead	0.73 mg/L	0.0081 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

February 4, 1994	Nickel	0.02 mg/L	0.0082 mg/L	Section 3.4	SW1	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 4, 1994	Nickel	0.08 mg/L	0.0082 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 4, 1994	Zinc	2.75 mg/L	0.081 mg/L	Section 3.4	SW1	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 4, 1994	Zinc	3.4 mg/L	0.081 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 14, 1994	Copper	1.55 mg/L	0.0031 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 14, 1994	Copper	2.95 mg/L	0.0031 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 14, 1994	Nickel	0.17 mg/L	0.0082 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 14, 1994	Zinc	4.12 mg/L	0.081 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 14, 1994	Zinc	5.45 mg/L	0.081 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
April 19, 1995	Copper	1.26 mg/L	0.0031 mg/L	Section 3.4	SW5	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
April 19, 1995	Lead	0.24 mg/L	0.0081 mg/L	Section 3.4	SW5	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

April 19, 1995	Zinc	4.5 mg/L	0.081 mg/L	Section 3.4	SW5	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 22, 1996	Copper	0.97 mg/L	0.0031 mg/L	Section 3.4	SW6	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 22, 1996	Lead	0.33 mg/L	0.0081 mg/L	Section 3.4	SW6	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 22, 1996	Nickel	0.27 mg/L	0.0082 mg/L	Section 3.4	SW6	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 22, 1996	Zinc	3.55 mg/L	0.081 mg/L	Section 3.4	SW6	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 5, 1996	Copper	2.68 mg/L	0.0031 mg/L	Section 3.4	SW3	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 5, 1996	Lead	0.15 mg/L	0.0081 mg/L	Section 3.4	SW3	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 5, 1996	Nickel	0.21 mg/L	0.0082 mg/L	Section 3.4	SW3	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 5, 1996	Zinc	10.01 mg/L	0.081 mg/L	Section 3.4	SW3	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 13, 1996	Copper	0.41 mg/L	0.0031 mg/L	Section 3.4	SW5	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 13, 1996	Lead	0.21 mg/L	0.0081 mg/L	Section 3.4	SW5	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

March 13, 1996	Nickel	0.06 mg/L	0.0082 mg/L	Section 3.4	SW5	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 13, 1996	Zinc	1.22 mg/L	0.081 mg/L	Section 3.4	SW5	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
April 8, 1996	Copper	0.12 mg/L	0.0031 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
April 8, 1996	Lead	0.06 mg/L	0.0081 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
April 8, 1996	Nickel	0.07 mg/L	0.0082 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
April 8, 1996	Zinc	0.88 mg/L	0.081 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Chromium	0.31 mg/L	0.05 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Copper	0.12 mg/L	0.0031 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Copper	0.52 mg/L	0.0031 mg/L	Section 3.4	SW1	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Copper	7.6 mg/L	0.0031 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Copper	0.64 mg/L	0.0031 mg/L	Section 3.4	SW3	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

February 10, 1997	Copper	0.99 mg/L	0.0031 mg/L	Section 3.4	SW5	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Copper	1.2 mg/L	0.0031 mg/L	Section 3.4	SW6	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Lead	0.057 mg/L	0.0081 mg/L	Section 3.4	SW1	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Lead	1.4 mg/L	0.0081 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Lead	0.021 mg/L	0.0081 mg/L	Section 3.4	SW3	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Lead	0.019 mg/L	0.0081 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Lead	0.04 mg/L	0.0081 mg/L	Section 3.4	SW5	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Nickel	0.017 mg/L	0.0082 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Nickel	0.018 mg/L	0.0082 mg/L	Section 3.4	SW6	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Nickel	0.022 mg/L	0.0082 mg/L	Section 3.4	SW1	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Nickel	0.032 mg/L	0.0082 mg/L	Section 3.4	SW3	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

February 10, 1997	Nickel	0.042 mg/L	0.0082 mg/L	Section 3.4	SW5	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Nickel	0.083 mg/L	0.0082 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Zinc	0.38 mg/L	0.081 mg/L	Section 3.4	SW4	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Zinc	0.91 mg/L	0.081 mg/L	Section 3.4	SW1	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Zinc	1.4 mg/L	0.081 mg/L	Section 3.4	SW6	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Zinc	2.5 mg/L	0.081 mg/L	Section 3.4	SW3	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Zinc	3.4 mg/L	0.081 mg/L	Section 3.4	SW5	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 10, 1997	Zinc	6.5 mg/L	0.081 mg/L	Section 3.4	SW2	SWM 1996-1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
December 6, 1997	Copper	0.45 mg/L	0.0031 mg/L	Section 3.4	Pier 3	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
December 6, 1997	Copper	0.84 mg/L	0.0031 mg/L	Section 3.4	Pier 1	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
December 6, 1997	Lead	0.018 mg/L	0.0081 mg/L	Section 3.4	Pier 1	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

December 6, 1997	Lead	0.045 mg/L	0.0081 mg/L	Section 3.4	Pier 3	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
December 6, 1997	Nickel	0.3 mg/L	0.0082 mg/L	Section 3.4	Pier 1	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
December 6, 1997	Nickel	0.3 mg/L	0.0082 mg/L	Section 3.4	Pier 3	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
December 6, 1997	Zinc	2.95 mg/L	0.081 mg/L	Section 3.4	Pier 1	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
December 6, 1997	Zinc	0.64 mg/L	0.081 mg/L	Section 3.4	Pier 3	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 29, 1998	Copper	0.62 mg/L	0.0031 mg/L	Section 3.4	Pier 1	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 29, 1998	Copper	0.27 mg/L	0.0031 mg/L	Section 3.4	Pier 3	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 29, 1998	Lead	0.029 mg/L	0.0081 mg/L	Section 3.4	Pier 1	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 29, 1998	Lead	0.022 mg/L	0.0081 mg/L	Section 3.4	Pier 3	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 29, 1998	Nickel	0.2 mg/L	0.0082 mg/L	Section 3.4	Pier 1	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 29, 1998	Zinc	0.83 mg/L	0.081 mg/L	Section 3.4	Pier 1	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

January 29, 1998	Zinc	0.56 mg/L	0.081 mg/L	Section 3.4	Pier 3	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 3, 1998	Copper	0.2 mg/L	0.0031 mg/L	Section 3.4	SD3 & SD4	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 3, 1998	Copper	0.2 mg/L	0.0031 mg/L	Section 3.4	SD10	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 3, 1998	Copper	1.6 mg/L	0.0031 mg/L	Section 3.4	SW03	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 3, 1998	Lead	0.1 mg/L	0.0081 mg/L	Section 3.4	SW03	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 3, 1998	Zinc	3.0 mg/L	0.081 mg/L	Section 3.4	SW 03	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 3, 1998	Zinc	0.4 mg/L	0.081 mg/L	Section 3.4	SD3 & SD4	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 3, 1998	Zinc	0.6 mg/L	0.081 mg/L	Section 3.4	SD10	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 19, 1998	Copper	0.5 mg/L	0.0031 mg/L	Section 3.4	SW05	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 19, 1998	Copper	0.6 mg/L	0.0031 mg/L	Section 3.4	SW07	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
February 19, 1998	Zinc	1.1 mg/L	0.081 mg/L	Section 3.4	SW05	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

February 19, 1998	Zinc	1.8 mg/L	0.081 mg/L	Section 3.4	SW07	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 25, 1998	Copper	0.3 mg/L	0.0031 mg/L	Section 3.4	SW03	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 25, 1998	Copper	1.2 mg/L	0.0031 mg/L	Section 3.4	SD23	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 25, 1998	Lead	0.1 mg/L	0.0081 mg/L	Section 3.4	SD23	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 25, 1998	Zinc	0.9 mg/L	0.081 mg/L	Section 3.4	SW03	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
March 25, 1998	Zinc	1.7 mg/L	0.081 mg/L	Section 3.4	SD23	SWM 1997-1998 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.35 mg/L	0.0031 mg/L	Section 3.4	SD1	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.67 mg/L	0.0031 mg/L	Section 3.4	SD3	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 8, 1998	Copper	1.24 mg/L	0.0031 mg/L	Section 3.4	SD6	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 8, 1998	Lead	0.027 mg/L	0.0081 mg/L	Section 3.4	SD1	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 8, 1998	Lead	0.022 mg/L	0.0081 mg/L	Section 3.4	SD3	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

November 8, 1998	Lead	0.254 mg/L	0.0081 mg/L	Section 3.4	SD6	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 8, 1998	Nickel	0.06 mg/L	0.0082 mg/L	Section 3.4	SD1	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 8, 1998	Nickel	0.05 mg/L	0.0082 mg/L	Section 3.4	SD3	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 8, 1998	Nickel	0.14 mg/L	0.0082 mg/L	Section 3.4	SD6	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 8, 1998	Zinc	1.80 mg/L	0.081 mg/L	Section 3.4	SD1	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 8, 1998	Zinc	2.14 mg/L	0.081 mg/L	Section 3.4	SD3	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
November 8, 1998	Zinc	2.82 mg/L	0.081 mg/L	Section 3.4	SD6	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1999	Copper	0.38 mg/L	0.0031 mg/L	Section 3.4	Stormdrain #2	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1999	Copper	0.44 mg/L	0.0031 mg/L	Section 3.4	Stormdrain #1	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1999	Lead	0.055 mg/L	0.0081 mg/L	Section 3.4	Stormdrain #2	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1999	Lead	0.126 mg/L	0.0081 mg/L	Section 3.4	Stormdrain #1	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

January 25, 1999	Nickel	0.06 mg/L	0.0082 mg/L	Section 3.4	Stormdrain #1	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1999	Nickel	0.05 mg/L	0.0082 mg/L	Section 3.4	Stormdrain #2	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1999	Zinc	1.41 mg/L	0.081 mg/L	Section 3.4	Stormdrain #1	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1
January 25, 1999	Zinc	1.53 mg/L	0.081 mg/L	Section 3.4	Stormdrain #2	SWM 1998-1999 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3, and B. Receiving Water Limitations 1

1. 40 CFR 131.38
2. Reference to Section 3.4 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 3.4.
3. The cited waste discharge requirement(s) can be found in Section 3.5 of this Technical Report.

3.9. Prior History of Enforcement Actions for Violations of NPDES Requirements

3.9.1. Administrative Civil Liability Orders

The San Diego Water Board issued Complaint No. 89-02 for Administrative Civil Liability against BAE Systems in 1989. Site inspections were performed on November 8, 1988 and November 15, 1988 following a citizen complaint. San Diego Water Board staff observed the discharge of abrasive grit waste and raw sewage to San Diego Bay on both occasions. The abrasive grit waste was sampled and analyzed and found to contain elevated concentrations of arsenic, chromium, lead, and zinc, and hazardous levels of copper. BAE Systems had not made an attempt to remove the sandblast grit. San Diego Water Board staff also observed improper disposal of abrasive grit waste during inspections in 1986, 1987, and earlier in the year of 1988. A civil liability fine was imposed on BAE Systems for $15,000.

In 2001, the San Diego Water Board issued Complaint No. 2001-138 Administrative Civil Liability to BAE Systems for violation of the storm water runoff requirements of its NPDES permit. Storm water runoff samples at two locations exceeded the levels established by General NPDES Order No. 97-36 for copper and zinc. A civil liability fine of $12,664 was imposed.

3.9.2. Court Findings and Judgments Against BAE Systems

On April 30, 1996, the Natural Resources Defense ~~Counsel~~Council, Inc.; San Diego Baykeeper, Inc.; and Kenneth J. Moser (hereinafter referred to as Plaintiffs) brought CWA legal action in

District Court against BAE Systems claiming the facility was violating its NPDES requirements by discharging unlawful amounts of pollutants into San Diego Bay and failing to prepare and implement environmental compliance and monitoring plans required by CWA.

On September 7, 1999, the United States District Court, San Diego, California issued its findings of fact and conclusions of law. The court found: (1) that Plaintiffs had presented “convincing evidence” that Defendant had not made the required inspections that it claimed to have made; (2) that, even accepting BAE Systems’ statement that it had made the required inspections, BAE Systems had not maintained adequate records of those inspections, with the result that a large number of inspection reports were missing; (3) that the reports that BAE Systems had provided demonstrated a pattern of poor housekeeping at BAE Systems’ facility and showed that violations, when reported, were not always remedied in a timely manner; (4) that BAE Systems’ inadequate implementation of its plans had led to “significant contributions of pollutants to BAE Systems’ leasehold;” (5) that BAE Systems’ leasehold within the Bay was “devoid of life;” (6) that the evidence conclusively demonstrated that substantial quantities of pollutants from BAE Systems’ paint-blasting operations had entered San Diego Bay in BAE Systems’ storm water discharges; (7) that BAE Systems’ failure to implement its storm water plans adequately was contributing to and perpetuating the contamination of its marine leasehold; and (8) that the harm to BAE Systems’ leasehold “could be remedied by BAE Systems with improved practices.” Based on those findings, the court concluded: (1) that it had subject matter jurisdiction over the action; (2) that Plaintiffs had standing; (3) that BAE Systems had violated, and was continuing to violate, the relevant permits and plans; and (4) that BAE Systems’ failure to implement its plans adequately was the result of “systemic problems” and “overall inadequacies” in implementation, rather than mere “snapshots” of isolated violations.

The findings and ruling was appealed to the Ninth Circuit Court of Appeals where the Circuit Judge held that: (1) individual citizen and citizen groups had standing to enforce provisions of the CWA; (2) CWA notice was sufficiently specific; (3) finding as to ongoing nature of BAE Systems’ violations was not clearly erroneous; (4) injunctive relief granted by district court was consistent with, and complementary to, existing permit requirements, and was not abuse of discretion or usurpation of authority of executive branch; and (5) civil penalty of $799,000 was not excessive.

Finally, the findings and ruling was appealed to the United States Supreme Court via Petition for Writ of Certiorari where the appeal was denied.

3.10. Shipyard Industry-wide Historical Operational Practices

In November of 1997, the U.S. Environmental Protection Agency released a study titled “EPA Office of Compliance Sector Notebook Project: PROFILE OF SHIPBUILDING AND REPAIR INDUSTRY.” According to the 1995 Toxic Release Inventory (TRI) data, the reporting shipbuilding and repair facilities released and transferred 39 different TRI chemicals for a total of approximately 6.5 million pounds of pollutants during calendar year 1995. These releases and transfers were dominated by volatile organic compounds (VOCs) and metal-bearing wastes, approximately 52 percent and 48 percent respectively (U.S. EPA, 1997c).

Releases to the air, water, and land have accounted for 37 percent (2.4 million pounds) of the reporting shipbuilding and repair facilities' total reportable chemicals. Of these releases, over 98 percent were released to the air from fugitive (74.6 percent; 1,778,818 pounds) or point (24.1 percent; 574,097 pounds) sources, while approximately 1.2 percent (29,479 pounds), and were release directly to water (U.S. EPA, 1997c). However, a significant percentage of the total pollutants released as fugitive air or point air releases end up in the water, adding significantly to the 1.2 percent that is released directly to water.

VOCs accounted for about 86 percent of the reporting shipbuilding and repair facilities' reported TRI releases. Xylenes, n-butyl alcohol, toluene, methyl ethyl ketone, and methyl isobutyl ketone account for about 65 percent of the reporting shipbuilding and repair facilities' reported releases. These organic compounds are typically found in solvents that were used extensively by the industry in thinning paints and for cleaning and degreasing metal parts and equipment (U.S. EPA, 1997c).

The remainder of the releases was primarily metal-bearing wastes. Copper, zinc, and nickel-bearing wastes accounted for about 14 percent of the reporting shipbuilding and repair facilities' reported releases. These pollutants were released primarily as fugitive emissions during metal plating operations and as overspray in painting operations and could also have been released as fugitive dust emissions during blasting operations (U.S. EPA, 1997c).

4. Finding 4: City of San Diego

Finding 4 of CAO No. ~~R9-2011-0001~~R9-2012-0024 states:

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

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

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

4.1. Jurisdiction

~~CWC s~~Water Code section 13304 contains the cleanup and abatement authority of the San Diego Water Board. Section 13304(a) provides in relevant part that the San Diego Water Board may issue a cleanup and abatement order to any person "who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirements ... or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance…."

For the reasons set forth below, the San Diego Water Board has determined that the City of San Diego should be named as a discharger in Cleanup and Abatement Order No. R9-~~2010-0002~~2012-0024 pursuant to ~~CWC s~~Water Code section 13304.

4.2. Admissible Evidence - State Water Resources Control Board Resolution No. 92-49

On June 18, 1992 (amended on April 21, 1994 and October 2, 1996) the State Water Board adopted Resolution No. 92-49, *Policies And Procedures For The Investigation And Cleanup And Abatement Of Discharges Under Water Code Section 13304*. Resolution No. 92-49 provides in part that:

III. The San Diego Water Board shall apply the following procedures in determining whether a person shall be required to investigate a discharge under CWC section 13267, or to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC section 13304. The San Diego Water Board shall:

A. Use any relevant evidence, whether direct or circumstantial, including, but not limited to, evidence in the following categories:

1. Documentation of historical or current activities, waste characteristics, chemical use, storage or disposal information, as documented by public records, responses to questionnaires, or other sources of information;

2. Site characteristics and location in relation to other potential sources of a discharge;

3. Hydrologic and hydrogeologic information, such as the difference in upgradient and downgradient water quality;

4. Industry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills, and clarifiers;

5. Evidence of poor management of materials or wastes, such as improper storage practices or inability to reconcile inventories;

6. Lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal;

7. Physical evidence, such as analytical data, soil or pavement staining, distressed vegetation, or unusual odor or appearance;

8. Reports and complaints;

9. Other agencies' records of possible known discharge; and

10. Refusal or failure to respond to San Diego Water Board inquiries.

4.3. The City of San Diego Owns and Operates a Municipal Separate Storm Sewer System (MS4) Through Which It Discharges Urban Runoff

4.3.1. MS4 Description

The City of San Diego (City) owns and operates an MS4 conveyance through which it discharges urban runoff into waters of the United States within the San Diego Region. The City's MS4 conveys urban runoff from approximately 237 square miles of urbanized area and includes more than 39,000 storm drain structures and over 900 miles of storm drain pipes and channels.

The City of San Diego owns and operates the following MS4 storm drains which convey urban runoff from source areas upgradient of the Shipyard Sediment Site's property and discharge directly or indirectly into San Diego Bay within the NASSCO and BAE Systems leasehold:

- **City of San Diego, Chollas Creek MS4 Storm Drains**

  The City of San Diego owns and operates approximately 816 MS4 storm drain outfalls[43] which convey urban runoff into Chollas Creek, a tributary of San Diego Bay, upstream of the NASSCO and BAE Systems leaseholds. The City's MS4 urban runoff discharges into Chollas Creek contribute to the elevated pollutant concentrations found at the downstream Shipyard Sediment Site. The mouth of Chollas Creek is immediately adjacent to the southern boundary of the Shipyard Sediment Site. Available studies (Schiff, 2003, Katz et al., 2003; Chadwick et al., 1999) indicate that storm water plumes emanating from Chollas Creek outflow to San Diego Bay are toxic to marine life and introduce suspended solids, copper, zinc, and lead to the Shipyard Sediment Site through settling of particles.

- **City of San Diego MS4 Storm Drain SW4**

  The storm drain outfall identified as SW4 in the Shipyard Report (Exponent, 2003) enters BAE Systems leasehold with two contributing storm pipes located at the foot of Sampson and Sicard Streets. These pipes join together somewhere beneath BAE Systems' leasehold, ultimately discharging into San Diego Bay at the SW4 outfall located at a point between Piers 3 and Pier 4 on the BAE Systems leasehold[44] at the

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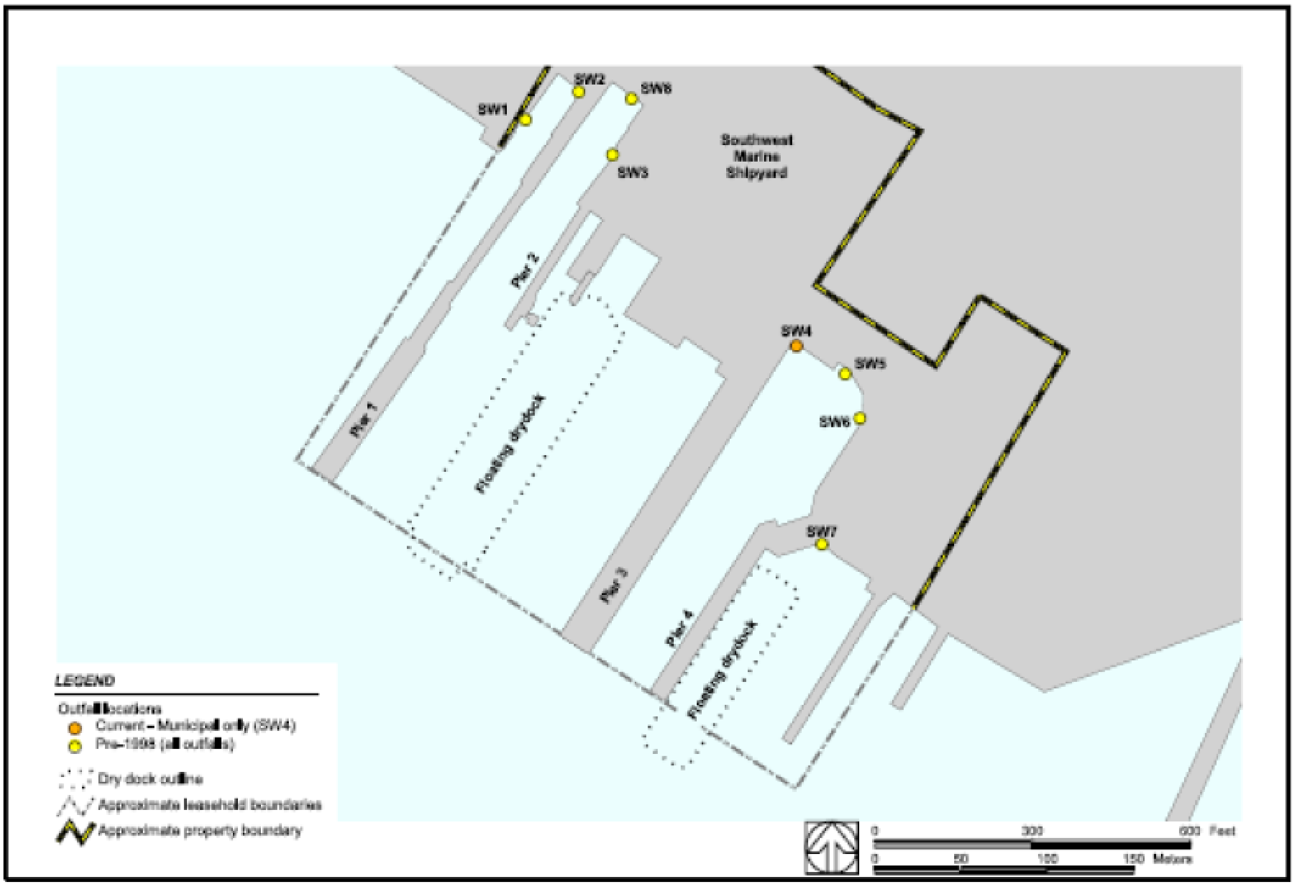
[43] Zirkle, Chris, Deputy Director, City of San Diego, 2006. Letter to John Robertus, Regional Board Executive Officer, regarding "Comments on the Total Maximum Daily Load for Indicator Bacteria, Project I- Beaches and Creeks in the San Diego Region." Page 9. February 3, 2006.

[44] A 1968 City of San Diego drainage easement figure shows a 42-inch storm drain, discharging into the Bay between Piers 3 and 4. No further information was provided by the City of San Diego concerning the SW4 outfall.

Shipyard Sediment site. This storm drain receives runoff from Sicard, Belt, and Sampson streets. Figure 4-1shows the storm drain outfalls at the BAE Systems' leasehold.

Figure 4-1 Storm Drain Outfalls at BAE Systems' Leasehold

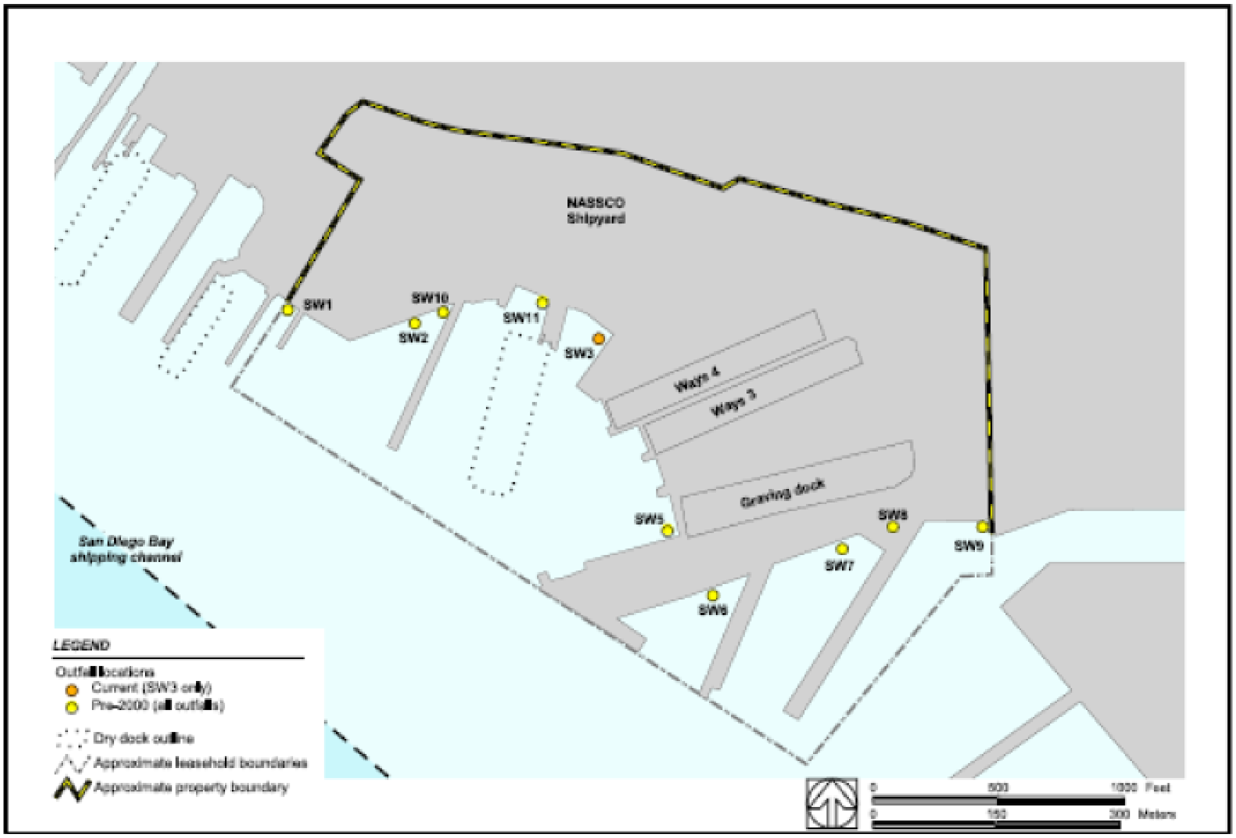


(Exponent, 2003)

- **City of San Diego MS4 Storm Drain SW9**

This storm drain outfall is identified as SW9 in the Shipyard Report (Exponent, 2003) and enters NASSCO's leasehold at the foot of 28th Street and discharges at the southeasterly corner of the leasehold into Chollas Creek, a tributary of San Diego Bay. (Exponent, 2003; ENV America, 2004a; City of San Diego, 2004a) Storm Drain SW9 collects flow from 28th Street, and stretches from the I-5 freeway to the bay including parts of Belt Street and Harbor Drive. Figure 4-2 shows the storm drain outfalls at NASSCO's leasehold.

Figure 4-2 Storm Drain Outfalls at NASSCO's Leasehold



(Exponent, 2003)

4.3.2. Urban Runoff is a "Waste" and a "Point Source Discharge" of Pollutants

Urban runoff is a waste, as defined in the ~~CWC~~ Water Code that contains pollutants and adversely affects the quality of the waters of the state.[45] The discharge of urban runoff from an MS4 conveyance is a "discharge of pollutants from a point source" into waters of the United States as defined in the CWA.[46]

The most common categories of pollutants in urban runoff include total suspended solids (TSS), sediment (due to anthropogenic activities), pathogens (e.g., bacteria, viruses, protozoa), heavy

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[45] See ~~California~~ Water Code ~~(CWC)~~ Section 13050(d). Waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.

[46] 40 CFR 122.2 defines "point source" as "any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff." 40 CFR 122.2 defines "discharge of a pollutant" as "Any addition of any 'pollutant' or combination of pollutants to 'waters of the United States' from any point source."

metals (e.g., copper, lead, zinc, and cadmium), petroleum products and polynuclear aromatic hydrocarbons (PAHs and HPAHs), synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash.[47]

4.4. The City of San Diego Discharged Waste to San Diego Bay

The City of San Diego has caused or permitted the discharge of urban storm water pollutants directly to San Diego Bay at the Shipyard Sediment Site. The pollutants include metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), TSS, 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 urban storm water pollutants through its MS4 conveyance to Chollas Creek resulting in the exceedances of chronic and acute CTR copper, lead, and zinc criteria for the protection of aquatic life.

Urban runoff discharges from the City of San Diego's MS4 are regulated under NPDES requirements prescribed by the San Diego Water Board pursuant to CWA section 402 and CWC section 13376. The City of San Diego must comply with all conditions of the NPDES requirements. Any noncompliance of NPDES requirements constitutes a violation of the CWA and CWC and is grounds for enforcement action, including the issuance of a cleanup and abatement order under the circumstances described in CWC section 13304. CWC section 13304 contains the cleanup and abatement authority of the San Diego Water Board. Section 13304(a) provides, in relevant part, that the San Diego Water Board may issue a cleanup and abatement order to any person "who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement…"

The City of San Diego's NPDES Permit requirement urban runoff discharges are documented in the San Diego Water Board records via monitoring reports (filed by the *San Diego County Municipal Copermittees*). The City of San Diego's urban runoff discharges are presented below in Section 4.7 of this Technical Report.

4.5. The City of San Diego Discharged Waste to San Diego Bay Creating Pollution, Contamination, and Nuisance Conditions in San Diego Bay

The City of San Diego has contributed to the accumulation of pollutants in marine sediment at the Shipyard Sediment Site by discharging urban storm water pollutants from MS4 discharges at levels, which cause, and threaten to cause, conditions of pollution, contamination, and nuisance by exceeding applicable water quality objectives for toxic pollutants in San Diego Bay. ~~CWC s~~Water Code section 13304 requires that any person who causes any waste to be discharged, or

[47] Finding 7 of Order No.2001-001, NPDES No. CAS0108758, Waste Discharge Requirements For Discharges Of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District.

deposited where it probably will be discharged, into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance is subject to cleaning up or abating the effects of the waste.

The Porter-Cologne Water Quality Act defines "pollution" as "an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects … the waters for beneficial uses.…"[48] "Contamination" is defined as "an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."[49]

Pollutants conveyed and discharged by the MS4 conveyance include metals, TSS, sediment, petroleum products, pesticides, herbicides, and PCBs. Many of these same pollutants are present in marine sediment at the Shipyard Sediment Site in highly elevated concentrations as compared to sediment chemistry levels found at off-site reference stations located in areas of San Diego Bay.[50]

As stated above, since 1990 the City of San Diego's NPDES requirements have specifically prohibited urban runoff discharges that cause pollution, contamination or nuisance conditions in San Diego Bay or otherwise cause or contribute to violations of San Diego Bay water quality standards.

Based on the evidence presented in Section 4.7 of this Technical Report, the City of San Diego has a history of discharging pollutants from MS4 Storm Drains SW4, SW9, and Chollas Creek, to the Shipyard Sediment Site at levels that have contributed to a condition of pollution, contamination, or nuisance at the Shipyard Sediment Site. As described in Sections 14 through 28 of this Technical Report these same pollutants in the discharges have accumulated in San Diego Bay sediment at levels that may:

11. Adversely affect the beneficial uses of San Diego Bay, violating a NPDES requirement prohibitions pertaining to discharges that cause pollution, contamination, or nuisance conditions in San Diego Bay; and

12. Violate NPDES requirements pertaining to discharges that degrade marine communities, cause adverse effects on the environment or the public health, or result in harmful concentrations of pollutants in marine sediment.

Accordingly, it is concluded that the City of San Diego has caused or permitted the discharge of waste to San Diego Bay in a manner causing the creation of pollution or nuisance conditions and that it is appropriate for the San Diego Water Board to issue a cleanup and abatement order naming the City of San Diego as a discharger pursuant to ~~CWC s~~Water Code section 13304.

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48 Water Code section 13050(1).

49 Water Code section 13050(k).

50 See Section 16 of this Technical Report.

4.6. NPDES Requirement Regulation

Urban runoff discharges from the City of San Diego's MS4 are regulated under NPDES requirements prescribed by the San Diego Water Board pursuant to CWA section 402 and ~~CWC s~~Water Code section 13376. These requirements are referred to as either NPDES requirements[51] or by the federal terminology "NPDES Permit." The City of San Diego's first NPDES requirements started in 1990, when the San Diego Water Board issued WDRs for storm water and urban runoff. A listing of the successive NPDES requirements adopted by the San Diego Water Board to regulate the City of San Diego's MS4 Urban Runoff discharges is provided in Table 4-1 below.

Table 4-1 City of San Diego NPDES Permits

Order Number / NPDES No.	Order Title	Adoption Date	Expiration Date
Order No. 90-42 NPDES No. CA0108758	Waste Discharge Requirements For Storm water and Urban Runoff from the County of San Diego the Incorporated Cities of San Diego County and the San Diego Unified Port District	July 16, 1990	February 21, 2001
Order No. 2001-01, NPDES No. CAS0108758	Waste Discharge Requirements For Discharges Of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cites of San Diego County, and the Unified Port District	February 21, 2001	January 24, 2007
Order No. R9-2007-01, NPDES No. CAS0108758	Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of The County Of San Diego, The Incorporated Cities Of San Diego County, The San Diego Unified Port District, and The San Diego County Regional Airport Authority	January 24, 2007	Present

The City of San Diego must comply with all conditions of the NPDES requirements. Any noncompliance of NPDES requirements constitutes a violation of the CWA and ~~CWC~~ Water Code and is grounds for enforcement action, including the issuance of a cleanup and abatement order under the circumstances described in ~~CWC~~ Water Code section 13304.

Each of the City of San Diego's successive NPDES requirements described here has specifically prohibited urban runoff discharges that cause pollution, contamination or nuisance conditions in San Diego Bay, or otherwise cause or contribute to violations of San Diego Bay water quality standards.

[51] Pursuant to Chapter 5.5 of the Porter-Cologne Water Quality Act, to avoid the issuance by the United States Environmental Protection Agency of separate and duplicative NPDES permits for discharges in California that would be subject to the Clean Water Act, the State's Waste Discharge Requirements (WDRs) for such discharges implement the NPDES regulations and entail enforcement provisions that reflect the penalties imposed by the Clean Water Act for violation of NPDES permits issued by the U.S. EPA. Thus, the State's WDRs that implement federal NPDES regulations (NPDES requirements) serve in lieu of NPDES permits.

4.6.2. Order No. 90-42, NPDES No. CA0108758

Order 90-42, NPDES No. CA0108758, in effect from July 16, 1990 to February 21, 2001, contains the following narrative limits that relate to the discussions contained herein:

- VIII. ILLICIT CONNECTION/ILLEGAL DUMPING DETECTION PROGRAM B. The permittee shall effectively eliminate all identified illegal/illicit discharges in the shortest time practicable, and in no case later than July 16, 2005… …If it is determined that any of the preceding discharges cause or contribute to violations of water quality standards or are significant contributors of pollutants to waters of the United States, the discharges shall be prohibited ~~form~~ from entering storm water conveyance systems; and

- XIII. PROVISIONS A. Neither the treatment nor the discharge of pollutants shall create a pollution, contamination, or nuisance as defined by section 13050 of the CWC.

4.6.3. Order No. 2001-01, NPDES No. CAS0108758

Order No. 2001-01, NPDES No. CAS0108758, in effect from February 21, 2001 contains the following provisions that relate to the discussions contained herein:

- A. PROHIBITIONS - DISCHARGES … 1. Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC § 13050), in waters of the state are prohibited.

- A. PROHIBITIONS DISCHARGES … 2. Discharges from MS4s which cause or contribute to exceedances of receiving water quality objectives for surface water or ground water are prohibited.

- C. RECEIVING WATER LIMITATIONS … 1. Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) are prohibited.

The above NPDES requirement narrative limits are applicable to urban runoff discharges to San Diego Bay from the City of San Diego MS4 Storm Drains SW4, SW9, and Chollas Creek, which occurred during the effective term of Order Nos. 90-42 and 2001-01.

4.7. City of San Diego's NPDES Waste Discharges

4.7.1. City of San Diego, Chollas Creek MS4 Storm Drain Discharges

As described in Section 4.3.1, above, the City of San Diego owns and operates approximately 816 MS4 storm drains that convey urban runoff into Chollas Creek, a tributary of San Diego Bay, upstream of the NASSCO and BAE Systems leaseholds. The mouth of Chollas Creek is immediately adjacent to the southern extremity of the Shipyard Sediment Site. Available studies (Schiff, 2003; Katz et al., 2003; Chadwick et al., 1999) indicate that the storm water plumes emanating from Chollas Creek to San Diego Bay during storm events are toxic to marine life and can introduce a large fraction of the total storm event's production of suspended solids, copper, zinc, and lead to the Shipyard Sediment Site through settling of particles.

4.7.1.1. NPDES Requirements in Chollas Creek Monitoring Reports

The *San Diego County Municipal Copermittees 2002-2003 Urban Runoff Monitoring Final Report* submitted by the City of San Diego indicates that elevated levels of zinc, copper, and lead are present in the urban runoff outflow discharged from Chollas Creek into San Diego Bay. This sampling information indicates that zinc, copper, and lead are discharged at levels that are elevated compared to levels established by the CTR for saltwater.[52]

The numerical water quality criteria values in CTR were not included as numerical effluent limitations in the NPDES requirements issued to the City. However, the numerical values in CTR represent the latest, most up-to-date numerical thresholds for use in determining whether a chemical concentration in water is detrimental to its beneficial uses. By comparing CTR values with pollutant levels found in historical discharges, the San Diego Water Board is able to determine which discharges *may* have contributed to a condition of pollution, contamination, or nuisance at the Shipyard Sediment Site in the past. Also, where there are historical discharges elevated above CTR values, there exists an *elevated probability* that those same discharges are presently contributing to the condition of pollution, contamination, or nuisance at the Shipyard Sediment Site. In retrospect, to the extent that those historical, elevated discharges *did* contribute to the condition of pollution, contamination, or nuisance at the Shipyard Sediment Site in the past, and/or *did* contribute to the present condition of pollution at the Shipyard Sediment Site.

While not providing specific numerical effluent limitations for all possible chemicals, the San Diego Water Board did include an NPDES requirement condition that the City's urban runoff discharges not cause or threaten to cause, a condition of pollution, contamination, or nuisance.

[52] The California Toxics Rule (CTR) was finalized by the U.S. EPA in the Federal Register (65 Fed. Register 31682-31719), adding Section 131.38 to Title 40 of the Code of Federal Regulations on May 18, 2000. The full text of the CTR is available at the following web address: http://www.epa.gov/OST/standards/ctrindex.html.

To the extent that the City's urban runoff discharges in Chollas Creek were elevated above CTR criteria values the following specific discharges listed in Table 4-2 have caused or threatened to cause, a condition of pollution, contamination, or nuisance by contributing to the pollutants at the Shipyard Sediment Site, and/or contributed to the present condition of pollution at the Shipyard Sediment Site.

Table 4-2 Discharge Samples above CTR Values Occurring from 2001 to 2003

Date	Constituent	Urban Runoff Pollutant Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Source	Citation[3]
November 8, 2002	Copper	0.028 mg/L	0.0031 mg/L	Sections 4.4 and 4.5	2002 - 2003 Monitoring Report	Order No. 2001-01, A. Prohibition - Discharges 1 and 2, and C. Receiving Water Limitations 1
November 8, 2002	Lead	0.017 mg/L	0.0081 mg/L	Sections 4.4 and 4.5	2002 - 2003 Monitoring Report	Order No. 2001-01, A. Prohibition - Discharges 1 and 2, and C. Receiving Water Limitations 1
November 8, 2002	Zinc	0.118 mg/L	0.081 mg/L	Sections 4.4 and 4.5	2002 - 2003 Monitoring Report	Order No. 2001-01, A. Prohibition - Discharges 1 and 2, and C. Receiving Water Limitations 1
February 11, 2003	Copper	0.033 mg/L	0.0031 mg/L	Sections 4.4 and 4.5	2002 - 2003 Monitoring Report	Order No. 2001-01, A. Prohibition - Discharges 1 and 2, and C. Receiving Water Limitations 1
February 11, 2003	Lead	0.029 mg/L	0.0081 mg/L	Sections 4.4 and 4.5	2002 - 2003 Monitoring Report	Order No. 2001-01, A. Prohibition - Discharges 1 and 2, and C. Receiving Water Limitations 1
February 25, 2003	Copper	0.016 mg/L	0.0031 mg/L	Sections 4.4 and 4.5	2002 - 2003 Monitoring Report	Order No. 2001-01, A. Prohibition Discharges 1 and 2, and C. Receiving Water Limitations 1
February 25, 2003	Lead	0.023 mg/L	0.0081 mg/L	Sections 4.4 and 4.5	2002 - 2003 Monitoring Report	Order No. 2001-01, A. Prohibition Discharges 1 and 2, and C. Receiving Water Limitations 1
February 25, 2003	Zinc	0.23 mg/L	0.081 mg/L	Sections 4.4 and 4.5	2002 - 2003 Monitoring Report	Order No. 2001-01, A. Prohibition Discharges 1 and 2, and C. Receiving Water Limitations 1

1. 40 CFR 131.38
2. Reference to Sections 4.4 and 4.5 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Sections 4.4 and 4.5.

3. The cited waste discharge requirement(s) can be found in Section 4.6 of this Technical Report.

4.7.1.2. Chollas Creek Metals Total Maximum Daily Loads (TMDL)

Chollas Creek was placed on the CWA section 303(d) List of Water Quality Limited Segments (List of Water Quality Limited Segments) in 1996 for the metals cadmium, copper, lead and zinc.

On June 29, 2005 the San Diego Water Board adopted a TMDL for metals in Chollas Creek.[53] This TMDL provides additional evidence that concentrations of dissolved copper, lead, and zinc in Chollas Creek waters have frequently exceeded numeric water quality criteria values contained in the CTR. Furthermore, in a Toxicity Identification Evaluation performed in 1999, Chollas Creek storm water concentrations of zinc and to a lesser extent copper were identified as causing or contributing to reduced fertility in the purple sea urchin.[54]

Urban runoff discharges from the City of San Diego's MS4 are considered to be one of the leading causes of receiving water quality impairments in the Chollas Creek Watershed. Storm water samples from Chollas Creek collected by various sources between 1994 and 2003 frequently exceeded CTR freshwater quality criteria for copper, lead, and zinc (Table 4-3).

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[53] See Regional Board Resolution No. R9-2005-0111, A Resolution Adopting An Amendment To The Water Quality Control Plan For The San Diego Region To Incorporate Total Maximum Daily Loads For Dissolved Copper, Lead, And Zinc In Chollas Creek, Tributary To San Diego Bay, June 29, 2005. See also Regional Board Technical Report, Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay, June 29, 2005.

[54] Regional Board Resolution No. R9-2005-0111. Footnote 7, supra. Finding 8.

Table 4-3 Chollas Creek CTR Exceedances[55]

COPPER			Concentrations reported in µg / L				# of exceedances (CTR) [4]	
Collection Dates	**Organization**	**n**	**min**	**max**	**mean**	**median**	**CMC**	**CCC**
Feb 94 - Feb 03	MS4 Copermittees	58	2.5 [1]	81.6 [2]	16.4 [3]	11.0 [3]	16 of 32	20 of 32
Feb - Apr, 00	Caltrans	4	5.1	11	7.8	7.5	NA [5]	NA [5]
Feb - Mar, 00	SCCWRP	2	51.2	63	57.1	57.1	NA [5]	NA [5]
Jan , Feb & Nov, 01	DPR	14	5	34	11.7	9.8	5 of 12	7 of 12
Sep-00	ES Babcock	4	1.92	28.8	9.8	4.3	NA [7]	NA [7]
Mar - Apr 99	SCCWRP (TIE)	3	10	30	18.3	15	2 of 3	3 of 3
Jun 91 & Mar 92	SD Water Board	5	3	8	6.4	7	0 of 5	0 of 5
LEAD			**Concentrations reported in µg / L**				**# of exceedances (CTR) [4]**	
Collection Dates	**Organization**	**n**	**min**	**max**	**mean**	**median**	**CMC**	**CCC**
Feb 94 - Feb 03	MS4 Copermittees	57	1.0 [1]	118 [2]	16.4 [3]	3.0 [3]	0 of 19	10 of 19
Feb - Apr, 00	Caltrans	4	2.9	11	5.5	4	NA [5]	NA [5]
Jan , Feb & Nov, 01	DPR	14	1.0 [1]	46	7.3	2	1 of 12	6 of 12
Sep-00	ES Babcock	4	2.0 [1]	4.1	1.9	1.2	NA [7]	NA [7]
Mar - Apr 99	SCCWRP (TIE)	3	10.0 [1]	82	39	30	1 of 2	2 of 2
Jun 91 & Mar 92	SD Water Board	5	5.0 [1]	29	12.2	11	0 of 3	1 of 3
ZINC			**Concentrations reported in µg / L**				**# of exceedances (CTR) [4]**	
Collection Dates	**Organization**	**n**	**min**	**max**	**mean**	**median**	**CMC**	**CCC**
Feb 94 - Feb 03	MS4 Copermittees	57	8	548 [2]	105.6 [3]	73 [3]	12 of 42	12 of 42
Feb - Apr, 00	Caltrans	4	17	42	28.8	28	NA [5]	NA [5]
Feb - Mar, 00	SCCWRP	2	146	150.8	148.4	148.4	NA [5]	NA [5]
Jan , Feb & Nov, 01	DPR	14	16.8	370	137.6	105	7 of 12	7 of 12

[55] From the Regional Board Technical Report, Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay, June 29, 2005.

COPPER			Concentrations reported in µg / L				# of exceedances (CTR) [4]	
Sep-00	ES Babcock/RB	4	10.0 [1]	45	21.3	17.5	NA [7]	NA [7]
Mar - Apr 99	SCCWRP (TIE)	3	90	220	173.3	210	2 of 3	2 of 3
Jun 91 & Mar 92	SD Water Board	5	3	188	45	11	0 of 5	1 of 5

1. Sample below Reporting Limit
2. Calculated from total concentration
3. Using all samples (measured dissolved and calculated from total). Samples below detection limit entered as 1/2 detection limit for calculations
4. Considering only measured dissolved concentrations and samples not below DL or RL (number in parenthesis represents available sample pool under these criteria).
5. No associated hardness values available
6. All samples reported as "less than"
7. All dissolved samples calculated from total

4.7.1.3. Chollas Creek Outflow Plume

Chollas Creek, a tributary of San Diego Bay, is an urban creek with highly variable flows. The highest flow rates are associated with storm events. Extended periods with no surface flows occur during dry weather, although pools of standing water may be present. Much of the creek has been channelized and concrete lined, but some sections of earthen creek bed remain. The mouth of the creek is located on the eastern shoreline of central San Diego Bay. San Diego Bay, at the mouth of Chollas Creek, is on the List of Water Quality Limited Segments for sediment toxicity and degraded benthic community impairments. The mouth of Chollas Creek is immediately adjacent to the southern boundary of the Shipyard Sediment Site. Based on the considerations discussed below the San Diego Water Board concludes that storm water outflows from Chollas Creek has contributed to the accumulation of pollutants in marine sediment at the Shipyard Sediment Site.

Chollas Creek provides significant freshwater flow, and elevated suspended solids and chemical pollutant loading into San Diego Bay. Urban runoff from Chollas Creek has been shown to be toxic to both saltwater and freshwater organisms. In-channel wet-weather monitoring from previous storm seasons showed that samples of Chollas Creek storm water were toxic to the water flea (*Ceriodaphnia dubia*), the fathead minnow (*Pimephales promelas*), and the purple sea urchin (*Strongylocentrotus purpuratus*). A study conducted by Southern California Coastal Research Project (SCCWRP) in 2001 to establish the linkage between the Chollas Creek in-channel toxicity measurements and potential impairments in the receiving water of San Diego Bay, (Schiff, 2003), concluded that:

- Storm water plumes from Chollas Creek extended over an area of 2 km^2 in San Diego Bay. The study observed that storm water plumes emanating from Chollas Creek extended between 0.02 and 2.25 km^2 over San Diego Bay during small to moderately-sized storm events. Plumes were easily distinguished using salinity as a conservative tracer of wet weather inputs. Turbidity was also a good tracer of the plume.

- Toxicity extended up to 1 km from the Creek mouth and was proportional to the amount of runoff dilution. The SCCWRP study measured toxicity using the purple sea urchin (Strongylocentrotus purpuratus) fertilization test in both storm water samples taken from the creek and samples taken from the storm water plume in San Diego Bay. This toxicity varied across the gradient of plume influence and was well correlated with the amount of storm water present in the sample. All samples were salinity adjusted before toxicity testing, so the gradient in toxicity appears to be a function of toxicants present in the storm water discharges.

- The toxic part of the plume was smaller than the salinity signal. Although toxicity was measured in the storm water plume emanating from Chollas Creek, the entire plume was not toxic. In the two storms that were mapped from this study, the toxic portion of the plume was approximately 25% to 50% of the plumes' salinity signal. This reduction in the spatial extent of plume toxicity was likely due to dilution and mixing of the plume in the Bay.

- In-channel and plume toxicity was primarily due to trace metals including zinc and copper. TIEs conducted on storm water samples from both the Creek and from the storm water plume in the Bay identified dissolved trace metals, predominantly zinc, as the toxicant responsible for the majority of toxicity. Toxicity was eliminated by the addition of the metal chelating agent EDTA. Concentrations of dissolved zinc, and to a lesser extent copper, were high enough in the tested samples to account for the observed toxicity.

U.S. Navy studies (Katz et al., 2003; Chadwick et al., 1999) indicate that the Chollas Creek outflow (plume) to San Diego Bay can introduce pollutants to the Shipyard Sediment Site. The U.S. Navy funded a project in 2001 to quantify storm event mass loading of pollutants from upstream MS4/creek sources and from near-bay Navy sources as well as to characterize the spatial and temporal impacts from the plumes generated in the bay. Specific conclusions of the study Katz et al., 2003, include:

- During a single storm event in February 2001, the sediment plume containing pollutants from Chollas Creek was measured to cover an area up to 1.2 km away from the mouth of Chollas Creek.

- Storm water plumes developed off Chollas Creek quickly after the start of rainfall and were dispersed through tidal mixing 12 hours after run off ceased.

- Plume evolution in the bay was well tracked by all real-time measurement parameters though most clearly with salinity, light transmission, and oil fluorescence.

- Contaminants were primarily associated with particles and their strong association with total suspended solids (TSS) provides a good first order approximation for their distribution.

- Storm water is a continuing source of excessive levels of lead, zinc, chlordane, DDT, and PCBs, and possibly for TPAH and mercury to sediment at the mouth of the Chollas Creek.

The City of San Diego's own review of data suggests that Chollas Creek may be a localized source for metals in the Bay (City of San Diego, 2004a, b). The City's enforcement action against a metal plating shop is evidence of upstream industrial discharge to Chollas Creek, which discharges directly to the Bay (City of San Diego, 2004a, b).

4.7.2. City of San Diego, MS4 Storm Drain SW4 Discharges

As described in Section 4.3.1, the City of San Diego owns and operates an MS4 storm drain identified as SW4 in the Shipyard Report (Exponent, 2003) (see Figure 4-1 above) which conveys urban runoff from source areas upgradient of BAE Systems' property and discharges directly within the BAE Systems leasehold. Urban runoff discharged into the SW4 storm drain outfall is subject to the NPDES requirements cited in Section 4.6. Although no monitoring data is available for this outfall, it is highly probable that historical and current discharges from this outfall have discharged heavy metals and organics to San Diego Bay at the Shipyard Sediment Site.[56]

Recent evidence of illicit discharges from the City of San Diego's Storm Drain SW4 into the Shipyard Sediment Site is provided by the results of a recent sampling investigation conducted by the City of San Diego. On October 3, 2005, the City of San Diego conducted an investigation and observed evidence of an illegal discharge into the SW4 MS4 catch basin on the north side of Sampson Street between Belt Street and Harbor Drive, approximately 10 feet east of the railroad line that runs parallel with Belt Street. Specifically, the catch basin is located immediately to the east of the BAE Systems' parking lot and the SDG&E Silver Gate Power Plant, which is adjacent to the parking lot. During the City's investigation, three sediment samples were collected and analyzed for PCBs and PAHs. The first sample was collected from inside and at the base of a six-inch lateral entering the catch basin from the east. The second sample was collected from inside and at the base of the 12-inch lateral entering the catch basin from the north. The third sample was collected from the 18-inch pipe exiting the catch basin. The results of these three samples, presented in Table 4-4 below, indicate the presence of both PCBs and PAHs entering and exiting the municipal storm drain system catch basin and resulted in the City of San Diego issuing a Notice of Violation (NOV) to SDG&E (Zirkle, 2005a; Kolb, 2005b).

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56 See Section 4.3.2 for a description of the most common categories of pollutants found in urban runoff .

Table 4-4 City of San Diego MS4 Sediment Sample Results for PCBs and PAHs on October 3, 2005

Constituent	Effects Range-Low (ERL)[1] µg/kg	Effects Range-Median (ERM)[1] µg/kg	Alternative Sediment Cleanup Levels µg/kg	6" Lateral µg/kg	12" Lateral µg/kg	Catch Basin µg/kg
Aroclor-1016				< 50	< 50	< 50
Aroclor-1221				< 50	< 50	< 50
Aroclor-1232				< 50	< 50	< 50
Aroclor-1242				< 50	< 50	< 50
Aroclor-1248				< 50	< 50	< 50
Aroclor-1254				650	130	260
Aroclor-1260				720	120	360
Aroclor-1262				< 50	< 50	< 50
Sum of Aroclors®	22.7[2]	180[2]	420[3]	**1,370**	**250**	**620**
Naphthalene[4]	160	2,100		70	330	170
Acenaphthylene[4]	44	640		< 50	< 50	< 50
Acenaphthene[4]	16	500		< 50	< 50	< 50
Fluorene[4]	19	540		< 50	< 50	< 50
Phenanthrene[4]	240	1,500		210	140	< 50
Anthracene[4]	85.3	1,100		< 50	< 50	< 50
Fluoranthene[5]	600	5,100		< 50	< 50	3,300
Pyrene[5]	665	2,600		500	170	91
Benzo [a] Anthracene[5]	261	1,600		450	< 50	< 50
Chrysene[5]	384	2,800		210	65	< 50
Benzo [b] Fluoranthene[5]	NA	NA		260	67	< 50
Benzo [k] Fluoranthene[5]	NA	NA		160	110	< 50
Benzo [a] Pyrene[5]	430	1,600	1,010	130	59	< 50
Dibenz [a,h] Anthracene[5]	63.4	260		< 50	< 50	< 50
Benzo [g,h,i] Perylene[5]	NA	NA		< 50	< 50	< 50
Indeno [1,2,3-c,d] Pyrene[5]	NA	NA		93	< 50	< 50
Total PAHs	4,022	44,792		**2,083**	**941**	**3,391**

1. Long et al., 1995.
2. ERL and ERM levels are for Total PCBs
3. Cleanup level is for Total PCB Congeners
4. LPAH - low molecular weight polynuclear aromatic hydrocarbon
5. HPAH - high molecular weight polynuclear aromatic hydrocarbon

Non-detections are represented as less than the reporting limit.
(CEL, 2005)

The City of San Diego MS4 Storm Drain SW4 discharges into the BAE Systems leasehold between Piers 3 and 4. Sample stations from the Detailed Sediment Investigation (Exponent, 2003) in the area of this outfall include SW20 through SW25. The sample results for PCBs and PAHs are presented in Table 4-5.

Table 4-5 NASSCO & BAE Systems Detailed Sediment Investigation PCB and PAH Results for SW20 through SW25

Constituent	SW20 µg/kg	SW21 µg/kg	SW22 µg/kg	SW23 µg/kg	SW24 µg/kg	SW25 µg/kg
Aroclor-1016	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1221	< 500	< 520	< 57	< 58	< 460	< 51
Aroclor-1232	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1242	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1248	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1254	1,500	1,600	670	550	790	330
Aroclor-1260	1,600	1,800	790	710	870	380
Sum of Aroclors®	**3,100**	**3,400**	**1,500**	**1,300**	**1,700**	**710**
Naphthalene[1]	< 13	13	31	< 15	26	< 13
Acenaphthylene[1]	120	130	150	130	290	180
Acenaphthene[1]	16	14	17	19	14	13
Fluorene[1]	53	53	56	53	220	45
Phenanthrene[1]	300	220	330	360	810	260
Anthracene[1]	450	370	500	500	6,000	440
Fluoranthene[2]	930	580	910	960	7,100	750
Pyrene[2]	1,200	850	1,100	1,000	3,100	940
Benzo [a] Anthracene[2]	760	650	890	850	6,300	710
Chrysene[2]	1,800	1,400	1,900	1,800	11,000	1,300

Constituent	SW20 µg/kg	SW21 µg/kg	SW22 µg/kg	SW23 µg/kg	SW24 µg/kg	SW25 µg/kg
Benzo [b] Fluoranthene[2]	1,500	1,600	1,800	1,500	7,000	2,000
Benzo [k] Fluoranthene[2]	1,200	1,100	1,300	1,200	7,300	1,600
Benzo [a] Pyrene[2]	1,400	1,500	1,700	1,500	8,800	2,000
Dibenz [a,h] Anthracene[2]	200	210	230	220	1,100	240
Benzo [g,h,i] Perylene[2]	770	780	830	820	2,800	800
Indeno [1,2,3-c,d] Pyrene[2]	970	990	1,100	1,000	3,700	1,100
Total PAHs	**11,669**	**10,460**	**12,844**	**11,912**	**65,560**	**12,378**

1. LPAH - low molecular weight polynuclear aromatic hydrocarbon
2. HPAH - high molecular weight polynuclear aromatic hydrocarbon

Non-detections are represented as less than the quantitation limit.
(Exponent, 2003)

PCBs in sediment from the laterals and catch basin of the storm water conveyance system were found at levels that exceed the ERL and ERM of 22.7 µg/kg and 180 µg/kg, respectively (Long et al., 1995), as well as the proposed Alternative Sediment Cleanup Levels.

Sediment PCB levels, specifically Aroclor-1254 and 1260, and sediment PAH levels reported in the storm water conveyance system are also reported in the bay sediment near the storm water outfall as indicated by comparing Tables 4-4 and 4-5.

As outlined above, the City of San Diego MS4 Storm Drain SW4 has discharged pollutants, specifically Aroclor-1254 and 1260, and PAHs, into the BAE Systems leasehold and San Diego Bay at the Shipyard Sediment Site. These facts provide evidence that the City of San Diego MS4 Storm Drain SW4 has discharged and deposited pollutants to the Shipyard Sediment Site, both presently and in the past.

4.7.3. City of San Diego, MS4 Storm Drain SW9 Discharges

As described in Section 4.3.1, the City of San Diego owns and operates an MS4 storm drain identified as SW9 in the Shipyard Report (Exponent, 2003) (see Figure 4-2, above), which conveys urban runoff from source areas upgradient of NASSCO's property and discharges directly within the NASSCO leasehold. Urban runoff discharged into the SW9 storm drain outfall is subject to the NPDES requirements cited in Section 4.6. Although no monitoring data is available for this outfall, it is highly probable that historical and current discharges from this outfall have discharged heavy metals and organics to San Diego Bay at the Shipyard Sediment Site.[57]

[57] See Section 4.3.2 for a description of the most common categories of pollutants found in urban runoff.

A review of maps of the City's storm drain outfalls shows that the City's storm drain SW9 outfall is located in the NASSCO leasehold at the foot of 28th St. near the mouth of Chollas Creek (Exponent, 2003; ENV America, 2004a; City of San Diego, 2004a). SW9 collects flow from 28th Street, and stretches from the I-5 freeway to the bay including parts of Belt Street and Harbor Drive.

Surface sediment data at NASSCO sample station NA22, which is located near the SW9 storm drain outfall shows elevated concentrations of total high-molecular-weight polynuclear aromatic hydrocarbons (Total HPAHs) at 3,600 µg/kg), Dichlorodiphenyltrichloroethane (DDT) at 29.7µg/kg), and Chlordane at 21.1µg/kg. These pollutant levels are indicators of an urban runoff source (Exponent, 2003) and therefore indicate that historical urban runoff discharges occurred from the City via the SW9 outfall.

As described above, the surface sediment data at NASSCO sample station NA22 provides evidence that the City of San Diego MS4 Storm Drain SW9 conveys the HPAHs, DDT, and Chlordane pollutants into the NASSCO leasehold and San Diego Bay at the Shipyard Sediment Site. The urban runoff characteristics of the sediment pollutants at Station NA22 adjacent to the City of San Diego's MS4 Storm Drain SW9 provide evidence that the City has discharged pollutants to the Shipyard Sediment Site, both presently and in the past. The weight of evidence suggests that there are past and continuing discharges from Storm Drain SW9 that are contributing to the accumulation of pollutant in marine sediment.

5. Finding 5: Star & Crescent Boat Company

Finding 5 of CAO No. ~~R9-2011-001~~ R9-2012-0024states:

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

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

Board directs the Cleanup Team to reevaluate whether it is appropriate to amend the Order to add Star & Crescent as a Discharger.

5.1. Jurisdiction

CWC section 13304 contains the cleanup and abatement authority of the San Diego Water Board. Section 13304(a) provides in relevant part that the San Diego Water Board may issue a cleanup and abatement order to any person "who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirements… ...or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance…."

For the reasons set forth below, the San Diego Water Board has determined that there is sufficient evidence to conclude that San Diego Marine Construction Company caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create a condition of pollution or nuisance. The San Diego Water Board has further determined that due to Star & Crescent's uncertain legal status as a corporate successor and due to the federal litigation in which allocation issues under this Order will be resolved, Star & Crescent is not named as a discharger under this Order.~~Star & Crescent should be named as dischargers in Cleanup and Abatement Order No. R9-2005-0126 pursuant to CWC section 13304.~~

5.2. Admissible Evidence – State Water Resources Control Board Resolution No. 92-49

On June 18, 1992 (amended on April 21, 1994 and October 2, 1996) the State Water Board adopted Resolution No. 92-49, *Policies And Procedures For The Investigation And Cleanup And Abatement Of Discharges Under Water Code Section 13304*. Resolution No. 92-49 provides in part that:

IV. The San Diego Water Board shall apply the following procedures in determining whether a person shall be required to investigate a discharge under CWC section 13267, or to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC Code section 13304. The San Diego Water Board shall:

A. Use any relevant evidence, whether direct or circumstantial, including, but not limited to, evidence in the following categories:

1. Documentation of historical or current activities, waste characteristics, chemical use, storage or disposal information, as documented by public records, responses to questionnaires, or other sources of information;

2. Site characteristics and location in relation to other potential sources of a discharge;

3. Hydrologic and hydrogeologic information, such as the difference in upgradient and downgradient water quality;

4. Industry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills, and clarifiers;

5. Evidence of poor management of materials or wastes, such as improper storage practices or inability to reconcile inventories;

6. Lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal;

7. Physical evidence, such as analytical data, soil or pavement staining, distressed vegetation, or unusual odor or appearance;

8. Reports and complaints;

9. Other agencies' records of possible known discharge; and

10. Refusal or failure to respond to San Diego Water Board inquiries.

5.3. ~~Star & Crescent Owned the~~ San Diego Marine Construction Company Operations within the BAE Leasehold~~Facility~~ From Approximately 1915 Through 1972

5.3.1. Leasehold Information

~~Star & Crescent, as successor in interest to~~ San Diego Marine Construction Company contributed to the accumulation of pollutants in marine sediment through waste discharges from its shipyard facility located within or adjacent to the current BAE Systems leasehold between 1914 and 1972 (Woodward-Clyde, 1995).

The City of San Diego granted a lease to San Diego Marine Construction Company at the foot of Sampson Street in 1914 (SDUPD, 2004). In July 1972, San Diego Marine Construction Company sold its shipyard operations to Campbell Industries, and changed its corporate name, effective July 14, 1972, to Star & Crescent Investment Co. On March 19, 1976, Star & Crescent Boat Company was incorporated in California and on April 9, 1976, Star & Crescent Investment Co. (formerly San Diego Marine Construction Company) transferred ~~all~~ some portion of its assets and liabilities to Star & Crescent. The San Diego Water Board declines to determine the legal issue of whether or not ~~Accordingly,~~ Star & Crescent is the corporate successor of and therefore responsible for the conditions of pollution or nuisance caused or permitted by San Diego Marine Construction Company from approximately 1914 through July 1972.

~~Based on these considerations, the San Diego Water Board has determined that Star & Crescent, through its legal predecessor in interest San Diego Marine Construction Company, operated~~

~~within the BAE Systems leasehold from 1914 to July 1972 and that it still does business in California today.~~

5.4. ~~Star & Crescent, Through its Predecessor~~ San Diego Marine Construction Company Owned and Operated a Full Service Ship Construction, Modification, Repair, and Maintenance Facility

5.4.1. Facility Description

San Diego Marine Construction Company~~Star & Crescent~~ was a ship construction and repair facility located at the foot of Sampson Street in the City of San Diego. Ship repair facilities included two floating dry docks and three marine railways, which together with cranes, enabled ships to be launched or repaired. The basic purpose of the dry docks was to separate the vessel from the bay to provide access to parts of the ship normally underwater. Piers were used to support berthed vessels undergoing maintenance and repair operations and berthing barges were used to house vessel crews while ship repairs were being conducted. Because dry dock space was limited and expensive, many operations were conducted pier side. Marine railways were used to wheel vessels out of water (also called dry berthing a vessel). Activities conducted on dry berthed vessels were similar to those conducted in dry docks, but usually on a much smaller scale.

5.4.2. Activities Conducted by San Diego Marine Construction Company ~~(Star & Crescent)~~

Ship construction and repair have many industrial processes in common, including machining and metalworking, metal plating and surface finishing, surface preparation, solvent cleaning, application of paints and coatings, and welding. It is reasonable to assume that San Diego Marine Construction Company's~~Star & Crescent's~~ industrial activities were typical for the ship construction and repair industry and involved a multitude of industrial processes, many of which were conducted over San Diego Bay waters or very close to the waterfront. ~~Star & Crescent's~~ San Diego Marine Construction Company's operations likely included the following industrial processes:

- **Surface Preparation and Paint Removal**. Methods of surface preparation and paint removal included dry abrasive blasting, wet abrasive or slurry blasting, hydroblasting, and chemical paint stripping;

- **Paint Application**. After preparation, surfaces were painted. Most painting occurred in a dry dock and involved the ship hull and internal tanks. Painting was also conducted in other locations throughout the shipyard including piers and berths. Paint application was accomplished by way of air or airless spraying equipment and was a major activity at ~~Star & Crescent~~San Diego Marine Construction Company;

- **Tank Cleaning**. Tank cleaning operations used steam to remove dirt and sludge from internal tanks, particularly fuel tanks and bilges. Detergents, cleaners, and hot water were injected into the steam supply hoses;

- **Mechanical Repair/Maintenance/Installation**. A variety of mechanical systems and machinery required repair, maintenance, and installation;

- **Structural Repair/Alteration/Assembly**. Structural repair, alteration, and assembly generally involved welding, cutting, and fastening of steel plates or assembly blocks and other industrial processes;

- **Integrity/Hydrostatic Testing**. Hydrostatic or strength testing and flushing were conducted on hulls, tanks, or pipe repairs. Integrity testing was also conducted on new systems during ship construction phases;

- **Paint Equipment Cleaning**. All air and airless paint spraying equipment was typically cleaned following use. Paint equipment cleaning was a major producer of waste, including solvents, thinners, paint wastes, and sludges;

- **Engine Repair/Maintenance/Installation**. Automotive repair, ship engine repair, maintenance, and installation generated waste oils, solvents, fuels, batteries, and filters;

- **Steel Fabrication and Machining**. Fabrication of engine and ship parts occurred at ~~Star & Crescent~~San Diego Marine Construction Company. Cutting oils, fluids, and solvents were used extensively including acetone, methyl ethyl ketone (MEK) and chlorinated solvents;

- **Electrical Repair/Maintenance/Installation**. The repair, maintenance, and installation of electrical systems involved the use of numerous hazardous materials including trichlorethylene, trichloroethane, methylene chloride, and acetone;

- **Hydraulic Repair/Maintenance/Installation**. The repair, maintenance, and installation of hydraulic systems involved the replacement of spent hydraulic oils;

- **Tank Emptying**. Bilge, fuel, and ballast tanks were typically emptied prior to ship repair activities;

- **Fueling**. Fueling operations occurred at ~~Star & Crescent~~San Diego Marine Construction Company;

- **Shipfitting**. Shipfitting was conducted at ~~Star & Crescent~~San Diego Marine Construction Company, and is defined as the forming of ship plates and shapes, etc. according to plans, patterns, or molds;

- **Carpentry**. Woodworking, with associated wood dust production, was conducted at ~~Star & Crescent~~San Diego Marine Construction Company; and

- **Refurbishing/Modernization/Cleaning**. Refurbishing, modernization, and cleaning of ships were conducted at ~~Star & Crescent~~San Diego Marine Construction Company.

5.4.3. Materials Used by ~~Star & Crescent~~San Diego Marine Construction Company

Materials that were commonly used for the above listed industrial shipyard activities are summarized below. Although a few specific materials are included, the list consists primarily of major categories.

- **Abrasive Grit**. Typically slag was collected from coal-fired boilers and consisted principally of iron, aluminum, silicon, and calcium oxides. Trace elements such as copper, zinc and titanium were also likely present. Sand, cast iron, or steel shot were also used as abrasives. Enormous amounts of abrasive were needed to remove paint; for example, removing paint from a 15,000 square foot hull could take up to 6 days and consume 87 tons of grit. Grit was needed in all dry and wet abrasive blasting.

- **Paint**. Paints contained copper, zinc, chromium, and lead as well as hydrocarbons. Two major types of paints used on ship hulls were:

    - Anticorrosive Paints (primers) Vinyl, vinyl-lead, or epoxy based coatings are used. Others contained zinc chromate and lead oxide.

    - Antifouling Paints were used to prevent growth and attachment of marine organisms by continuously releasing toxic substances into the water. Cuprous oxide and tributyltin fluoride or tributyltin oxide were the principal toxicants in copper-based and organotin-based paints, respectively.

- **Miscellaneous Materials**. Oils (engine, cutting, and hydraulic), lubricants, grease, fuels, weld, detergents, cleaners, rust inhibitors, paint thinners, hydrocarbon and chlorinated solvents, degreasers, acids, caustics, resins, adhesives/cement/sealants, and chlorine.

5.4.4. Waste Generated by ~~Star & Crescent~~San Diego Marine Construction Company

Categories of wastes commonly generated by the above listed industrial shipyard activities include, but are not limited to, those listed below.

- **Abrasive Blast Water: Spent Grit, Spent Paint, Marine Organisms, and Rust**. Abrasive blast waste, consisting of spent grit, spent paint, marine organisms, and rust was generated in significant quantities during all dry or wet abrasive blasting procedures. The constituent of greatest concern with regard to toxicity is the spent paint, particularly the copper and tributyltin antifouling components, which are designed to be toxic and to continuously leach into the water. Other pollutants in paint included zinc, chromium, and lead. Abrasive blast waste was conveyed by water flows, by becoming airborne (especially during dry blasting), or by falling directly into receiving waters;

- **Fresh Paint**. Losses occurred when paint ended up somewhere other than its intended location (e.g., dry dock floor, bay, worker's clothing). These losses resulted from spills, drips, and overspray. Typical overspray losses are estimated to have been approximately 5 percent for air spraying; and 1 to 2 percent for airless spraying;

- **Bilge Waste/Other Oily Wastewater**. This waste was generated during tank emptying, leaks, and cleaning operations (bilge, ballast, fuel tanks). In addition to petroleum products (fuel, oil), tank wash water also contained detergents or cleaners and was generated in large quantities;

- **Blast Wastewater**. Hydroblasting generated large quantities of wastewater. In addition to suspended and settleable solids (spent abrasive, paint, rust, marine organisms) and water, blast wastewater also may have contained rust inhibitors such as diammonium phosphate and sodium nitrite;

- **Oils (engine, cutting, and hydraulic)**. In addition to spent products, fresh oils, lubricants, and fuels were released as a result of spills and leaks from ship or dry dock equipment, machinery, and tanks (especially during cleaning and refueling);

- **Waste Paints/Sludges/Solvents/Thinners**. These wastes were generated from cleaning paint equipment;

- **Construction/Repair Wastes and Trash**. These wastes included scrap metal, welding rods, slag (from arc welding), wood, rags, plastics, cans, paper, bottles, packaging materials, etc.; and

- **Miscellaneous Wastes**. These wastes included lubricants, grease, fuels, sewage (black and gray water from vessels or docks), boiler blowdown, condensate, discard, acid wastes, caustic wastes, and aqueous wastes (with and without metals).

The ~~Star & Crescent~~San Diego Marine Construction Company facility was located immediately adjacent to San Diego Bay. Surface water runoff from the facility, unless diverted, directly entered the bay. Wastes from the facility were conveyed to the bay by water flows, becoming airborne (especially during painting and blasting operations), or falling directly into the bay.

5.5. ~~Star & Crescent~~San Diego Marine Construction Company Discharged Waste to San Diego Bay Creating Pollution, Contamination, and Nuisance Conditions in San Diego Bay

Based on the information regarding the leasehold history and historical activities provided in Sections 5.3, 5.4, 5.7 and 5.8 the San Diego Water Board has determined that ~~Star & Crescent~~San Diego Marine Construction Company is responsible for discharging pollutants to the Shipyard Sediment Site as a result of its shipyard operations on what is currently the BAE Systems leasehold. CWC section 13304 provides that a person who causes any waste to be discharged, or deposited where it probably will be discharged, into waters of the state creating, or threatening to create, a condition of pollution or nuisance is subject to cleaning up or abating the effects of the waste.

The Porter-Cologne Water Quality Act defines “pollution” as “an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects… …the waters for beneficial uses …"[58] "Contamination" is defined as "an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."[59]

The discharge of pollutants included heavy metals and organics, including arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc, butyl tin species, PCBs, PCTs, PAHs, and TPH. As described in other sections of this report, these same pollutants have accumulated in San Diego Bay sediment adjacent to the former ~~Star & Crescent~~San Diego Marine Construction Company facility in concentrations that adversely affect the beneficial uses of San Diego Bay and present a public health risk.

Accordingly, it is concluded that ~~Star & Crescent~~San Diego Marine Construction Company, has caused or permitted waste to be discharged or deposited where it was discharged to San Diego Bay in a manner causing the creation of pollution, contamination, or nuisance conditions, and while~~that~~ it is appropriate for the San Diego Water Board to issue a cleanup and abatement order to an entity determined to be the legal corporate successor of San Diego Marine Construction Company~~naming Star & Crescent~~ as dischargers pursuant to CWC section 13304, the San Diego Water Board declines to determine the factual and legal questions to establish whether Star & Crescent is the corporate successor of San Diego Marine Construction Company.

Further discussion on pollution, contamination, and nuisance are available in Sections 1.4 and 1.5 of this Technical Report.

5.6. 1972 San Diego Water Board Ship Building and Repair Yard Investigation

In March of 1972, the San Diego Water Board initiated an investigation to determine the amount and kinds of pollutants that entered San Diego Bay from shipbuilding and repair facilities, and the possible effects that the pollutants could have on beneficial uses of San Diego Bay.[60] All shipbuilding and repair facilities located on San Diego Bay were inspected, including ~~Star & Crescent~~San Diego Marine Construction Company. Interviews with owners and managers of the facilities were conducted to determine (for the year 1971) the number of ships built or refinished at each facility; the cleaning methods employed; the amounts and kinds of vessel hull paints used; and the methods of disposing of trash, sandblasting waste, paints and oils. Bay sediment core samples were collected from San Diego Bay at various locations including the ~~Star & Crescent~~ San Diego Marine Construction Company leasehold. The report contains the following information pertaining to ~~Star & Crescent~~ San Diego Marine Construction Company discharges:

[58] Water Code section 13050(l).

[59] Water Code section 13050(k).

[60] The results of this investigation are contained in California Regional Water Quality Control Board, San Diego Region, Wastes Associated with Shipbuilding and Repair Facilities in San Diego Bay, June 1972 (RWQCB, 1972).

- San Diego Marine Construction Company ~~(subsequently Star & Crescent)~~ was engaged in shipbuilding and repair activities during 1971. Facilities included two dry docks (360 foot and 220 foot capacity respectively) and three marine railways (100 foot vessel capacity);

- During 1971, San Diego Marine Construction Company ~~(subsequently Star & Crescent)~~ constructed six new ships and refinished 70 ships up to 390 feet in length. Approximately 80 percent of the vessels were constructed of steel, 15 percent from wood and 5 percent from fiberglass. Approximately 20 to 50 percent of these ships were sand blasted. Approximately 8,000 gallons of paint and primer containing copper and tributyltin were used. Air sand blasting with black sand was used to strip vessels to bare metal in the dry docks and on marine railways;

- The ~~Star & Crescent~~San Diego Marine Construction Company facility was located immediately adjacent to San Diego Bay. Wastes from the facility were conveyed to the bay by water flows, by becoming airborne (especially during painting and blasting operations), or by falling directly into the bay;

- It was estimated by workers and managers at all San Diego Bay shipyards that 5 to 10 percent of the sand blasted waste and other waste was discharged to San Diego Bay. Based on San Diego Water Board waste volume estimates, this resulted in 335 tons of sand, 27 tons of copper oxide, 3 tons of lead oxide and 1 ton of zinc chromate being discharged to San Diego Bay on an annual basis in 1971; and

- On March 7, 1972 the San Diego Water Board collected bay sediment core samples from 11 selected sites in San Diego Bay offshore of the ship building and repair facilities (RWQCB, 1972). The results of the core sampling indicated that heavy metal concentrations in bay sediment were higher near the ship building and repair facilities than at other locations of San Diego Bay. Sampling Station No. 1 was located at San Diego Marine Construction Company ~~(subsequently Star & Crescent)~~ dry dock 1 and was included in the group of five stations that had the highest total concentration of metals (arsenic, chromium, copper, lead, mercury, nickel, and zinc).

5.7. Industry-wide Historical Operational Practices

In November of 1997, the U.S. EPA released a study titled "EPA Office of Compliance Sector Notebook Project: PROFILE OF SHIPBUILDING AND REPAIR INDUSTRY." According to the 1995 Toxic Release Inventory (TRI) data, the reporting shipbuilding and repair facilities released and transferred 39 different TRI chemicals for a total of approximately 6.5 million pounds of pollutants during calendar year 1995. These releases and transfers were dominated by volatile organic compounds (VOCs) and metal-bearing wastes, approximately 52 percent and 48 percent, respectively (U.S. EPA, 1997c).

Releases to the air, water, and land have accounted for 37 percent (2.4 million pounds) of the reporting shipbuilding and repair facilities' total reportable chemicals. Of these releases, over 98 percent were released to the air from fugitive (74.6 percent; 1,778,818 pounds) or point (24.1

percent; 574,097 pounds) sources, while approximately 1.2 percent (29,479 pounds) was released directly to water (U.S. EPA, 1997c). However, a significant percentage of the total pollutants released as fugitive air or point air releases end up in the water, adding significantly to the 1.2 percent that is released directly to water.

VOCs accounted for about 86 percent of the reporting shipbuilding and repair facilities' reported TRI releases. Xylenes, n-butyl alcohol, toluene, methyl ethyl ketone, and methyl isobutyl ketone account for about 65 percent of the reporting shipbuilding and repair facilities' reported releases. These organic compounds are typically found in solvents that were used extensively by the industry in thinning paints and for cleaning and degreasing metal parts and equipment (U.S. EPA, 1997c).

The remainder of the releases was primarily metal-bearing wastes. Copper, zinc, and nickel-bearing wastes accounted for about 14 percent of the reporting shipbuilding and repair facilities' reported releases. These pollutants were released primarily as fugitive emissions during metal plating operations and as overspray in painting operations and could also have been released as fugitive dust emissions during blasting operations (U.S. EPA, 1997c).

5.7.1. Miscellaneous Information on ~~Star & Crescent~~ San Diego Marine Construction Company Discharges

Historical operations at San Diego Marine Construction Company ~~(subsequently Star & Crescent)~~ during the years from 1914 to the early 1970's included the following (SDUPD, 2004):

- Used formaldehyde and arsenic in pretreated wood at the woodshop;
- Performed blasting, welding, and painting activities for Navy contract work in the blasting area;
- Used a dust suppression system for the blasting house, which consisted of blowers directed at the bay with a water spray to cause the blast dust to settle in the water; and
- Discharged all wastes generated on the dry dock, including blast grit, paint, etc. into the bay.

The shipyard operations that generate wastes including heavy metals and organic chemicals at ~~Star & Crescent~~San Diego Marine Construction Company included the following (SDUPD, 2004):

- Surface preparation and paint removal;
- Paint application;
- Tank cleaning; and
- Mechanical repair/maintenance/installation.

Delta Lines submitted a complaint to the SDUPD in 1970 regarding sandblasting residue from ~~Star & Crescent~~San Diego Marine Construction Company (SDUPD, 2004.)

5.8. Sediment Core Analytical Results

The sediment core analytical results were evaluated to assess the potential presence of wastes released by ~~Star & Crescent~~San Diego Marine Construction Company. The Shipyard Report provides analytical results from sediment cores collected down to depths of approximately 6 to 8 feet (Exponent, 2003). The results from Stations SW04, SW08 and SW17, the core locations closest to the shoreline within the former ~~Star & Crescent~~San Diego Marine Construction Company leasehold, are discussed below.

Peng et. al. (2003) reports a sedimentation rate of 0.92 centimeters per year (cm/yr) at a sampling station in the vicinity of the Shipyard Sediment Site outside the former San Diego Marine Construction Company~~Star & Crescent~~ leasehold. The sedimentation rate may be higher within the leasehold closer to the shoreline since the currents may be less and the shoreline is nearer the source(s) of sediment input. Table 5-1 shows the estimated years associated with the core depths for two different sedimentation rates. A sedimentation rate of 0.92 cm/yr suggests that the sediment in the 2 to 4 foot core were deposited prior to approximately 1936. Assuming a higher sedimentation rate of 2 cm/yr indicates that the sediment in the 2 to 4 foot core was deposited from approximately 1972 to 1942.

Table 5-1 Deposition Years for Cores Based on Sedimentation Rates

Core Depth	0.92 cm/year[1]	2.0 cm/year[2]
0 to 2 feet	2002 to 1936	2002 to 1972
2 to 4 feet	1936 to 1870	1972 to 1942
4 to 6 feet	1870 to 1804	1942 to 1912

1. 0.92 cm/year corresponds to approximately 33 years per foot.
2. cm/year corresponds to approximately 15 years per foot.

The analytical results from Stations SW04, SW08 and SW17, the core locations closest to the shoreline within the former ~~Star & Crescent~~ San Diego Marine Construction Companyleasehold, are provided in Table 5-2 below. The analytical results for tributyltin (TBT) were used to evaluate the applicability of the two deposition rates in Table 5-1. TBT was first used as a marine antifouling coating in the 1960s (GlobalSecurity.org, 2005). Therefore TBT should not be reported in sediment deposited prior to the 1960s unless TBT in the overlying sediment contaminated the underlying sediment by mechanisms such as bioturbation or disturbances via propeller wash.

Review of the 2 to 4 foot core results presented in Table 5-2 indicates the presence of significant TBT levels. A deposition rate of 0.92 cm/yr, suggests that the sediment at 2 to 4 feet were deposited between 1936 and 1870. However the TBT concentrations suggest that the 2 to 4 foot core interval includes sediment from the late 1960s or early 1970s. Therefore it is judged that the sedimentation rate is higher than 0.92 cm/year. A deposition rate of 2 cm/year suggests that the sediment in the core from 2 to 4 feet were deposited from 1942 to 1972. These dates are consistent with presence of TBT in cores collected at those depths. Therefore, the higher deposition rate of 2 cm/year is judged to be more applicable to the Shipyard Sediment Site than the lower 0.92 cm/yr rate.

Based on this evaluation it is concluded that the pollutants in the 2 to 4 foot cores include discharges made during the time of ~~Star & Crescent~~ San Diego Marine Construction Companytenancy from 1914 to 1972. As indicated in Table 5-2, some of the highest concentrations for PCBs, benzo[a] pyrene, tributyltin, arsenic, cadmium, chromium, copper, mercury, and nickel within each core are from the 2 to 4 feet depth.

Table 5-2 Selected Results from Core Stations SW04, SW08 and SW17

Depth	Contaminant	SW04	SW08	SW17
0 to 0.06 feet	PCB homologs µg/kg	5,200	2,700	-
0 to 2 feet	PCB homologs µg/kg	1,300	10,000	1,100
2 to 4 feet	PCB homologs µg/kg	27,000	13,000	1,300
4 to 5 feet	PCB homologs µg/kg			
4 to 6 feet	PCB homologs µg/kg		490	420
6 to 6.5 feet	PCB homologs µg/kg		6.2	
0 to 0.06 feet	Benzo [a] pyrene µg/kg	2,100	3,300	-
0 to 2 feet	Benzo [a] pyrene µg/kg	1,100	2,600	1,600
2 to 4 feet	Benzo [a] pyrene µg/kg	5,800	3,000	620
4 to 5 feet	Benzo [a] pyrene µg/kg			
4 to 6 feet	Benzo [a] pyrene µg/kg		85	200
6 to 6.5 feet	Benzo [a] pyrene µg/kg		6	
0 to 0.06 feet	Tributyltin µg/kg	3,300	1,900	-
0 to 2 feet	Tributyltin µg/kg	1,900	7,000	920
2 to 4 feet	Tributyltin µg/kg	5,000	5,100	600
4 to 5 feet	Tributyltin µg/kg			
4 to 6 feet	Tributyltin µg/kg		44	57
6 to 6.5 feet	Tributyltin µg/kg		2.3	

Depth	Contaminant	SW04	SW08	SW17
0 to 0.06 feet	Arsenic mg/kg	73	24	-
0 to 2 feet	Arsenic mg/kg	68	24	15
2 to 4 feet	Arsenic mg/kg	110	13	15
4 to 5 feet	Arsenic mg/kg			
4 to 6 feet	Arsenic mg/kg		4.9	3.7
6 to 6.5 feet	Arsenic mg/kg		2.1	
0 to 0.06 feet	Cadmium mg/kg	1.9	0.73	-
0 to 2 feet	Cadmium mg/kg	0.79	1.1	0.68
2 to 4 feet	Cadmium mg/kg	3.2	0.86	1.4
4 to 5 feet	Cadmium mg/kg			
4 to 6 feet	Cadmium mg/kg		0.07	.44
6 to 6.5 feet	Cadmium mg/kg		0.03	
0 to 0.06 feet	Chromium mg/kg	80	83	-
0 to 2 feet	Chromium mg/kg	26	100	87
2 to 4 feet	Chromium mg/kg	97	110	54
4 to 5 feet	Chromium mg/kg			
4 to 6 feet	Chromium mg/kg		7.4	30
6 to 6.5 feet	Chromium mg/kg		3.7	
0 to 0.06 feet	Copper mg/kg	1,500	900	-
0 to 2 feet	Copper mg/kg	370	1,500	440
2 to 4 feet	Copper mg/kg	2,200	1,500	280
4 to 5 feet	Copper mg/kg			
4 to 6 feet	Copper mg/kg		49	530
6 to 6.5 feet	Copper mg/kg		4.2	
0 to 0.06 feet	Lead mg/kg	430	220	-
0 to 2 feet	Lead mg/kg	150	360	100

Depth	Contaminant	SW04	SW08	SW17
2 to 4 feet	Lead mg/kg	410	340	90
4 to 5 feet	Lead mg/kg			
4 to 6 feet	Lead mg/kg		11	23
6 to 6.5 feet	Lead mg/kg		1.8	
0 to 0.06 feet	Mercury mg/kg	1.7	2.3	-
0 to 2 feet	Mercury mg/kg	1.1	4.8	1.30
2 to 4 feet	Mercury mg/kg	7.4	6.0	0.67
4 to 5 feet	Mercury mg/kg			
4 to 6 feet	Mercury mg/kg		0.3	0.17
6 to 6.5 feet	Mercury mg/kg		0.005	
0 to 0.06 feet	Nickel mg/kg	18	21	-
0 to 2 feet	Nickel mg/kg	8.3	15	19
2 to 4 feet	Nickel mg/kg	40	9.1	12
4 to 5 feet	Nickel mg/kg			
4 to 6 feet	Nickel mg/kg		2.6	7.6
6 to 6.5 feet	Nickel mg/kg		1.5	
0 to 0.06 feet	Silver mg/kg	1.6	1.5	-
0 to 2 feet	Silver mg/kg	0.59	1	2.0
2 to 4 feet	Silver mg/kg	1.4	0.49	1.1
4 to 5 feet	Silver mg/kg			
4 to 6 feet	Silver mg/kg		0.03	0.29
6 to 6.5 feet	Silver mg/kg		0.01	
0 to 0.06 feet	Zinc mg/kg	3400	830	-
0 to 2 feet	Zinc mg/kg	670	1,300	500
2 to 4 feet	Zinc mg/kg	1,500	790	400
4 to 5 feet	Zinc mg/kg			

Depth	Contaminant	SW04	SW08	SW17
4 to 6 feet	Zinc mg/kg		34	130
6 to 6.5 feet	Zinc mg/kg		10	

(Exponent, 2003)

There are uncertainties associated with this analysis. The estimated age associated with the core depths is dependent upon the sedimentation rate. However, unless the actual sedimentation rate is significantly higher than the 0.92 cm/yr to 2 cm/yr rates discussed above, it is likely that the much of the sediment below 2 feet were deposited before 1972, which was the end of ~~Star & Crescent's~~ San Diego Marine Construction Company's occupancy of the leasehold. Physical disturbances, such as bioturbation, dredging, and propeller wash, also introduce uncertainty into this interpretation. For example, if propeller wash from ship movements removes material from the bottom, the shallow sediment may be older than that indicated by applying the sedimentation rate. If disturbances result in re-deposition of older sediment on top of newer sediment, the shallow sediment may be older than interpreted.

The Shipyard Report uses the presence of graded bedding in the sediment profiles to identify areas of no apparent physical disturbance. Stations SW08 and SW17 were reported to be stations with no apparent physical disturbance (Exponent, 2003). Therefore, assuming a deposition rate of 2 cm/yr or less, the pollutants reported in the sediment below 2 feet at Stations SW08 and SW17 include discharges prior to 1972 and include wastes discharged by ~~Star & Crescent~~ San Diego Marine Construction Company during their tenancy from 1914 to 1972.

6. Finding 6: Campbell Industries

Finding 6 of CAO No. ~~R9-2011-0001~~R9-2012-0024 states:

The San Diego Water Board ~~alleges, but Campbell Industries denies,~~ finds that Campbell caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. These wastes contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH. From July 1972 through 1979, Campbell's wholly owned subsidiaries MCCSD and later San Diego Marine Construction Corporation operated a ship repair, alteration, and overhaul facility on what is now the BAE Systems leasehold at the foot of Sampson Street in San Diego. Shipyard operations were conducted at this site by Campbell over San Diego Bay waters or very close to the waterfront. An assortment of waste was generated at the facility including spent abrasive blast waste, paint, rust, petroleum products, marine growth, sanitary waste, and general refuse. Based on these considerations, Campbell is referred to as "Discharger(s)" in this CAO.

6.1. Jurisdiction

~~CWC~~ Water Code ssection 13304 contains the cleanup and abatement authority of the San Diego Water Board. Section 13304(a) provides in relevant part that the San Diego Water Board may issue a cleanup and abatement order to any person "who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirements … or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance…."

For the reasons set forth below, the San Diego Water Board has determined that Campbell should be named as dischargers in Cleanup and Abatement Order No. R9-~~2005-0126~~2012-0024 pursuant to ~~CWC~~ Water Code ssection 13304.

6.2. Admissible Evidence – State Water Resources Control Board Resolution No. 92-49

On June 18, 1992 (amended on April 21, 1994 and October 2, 1996) the State Water Board adopted Resolution No. 92-49, *Policies And Procedures For The Investigation And Cleanup And Abatement Of Discharges Under Water Code Section 13304*. Resolution No. 92-49 provides in part that:

V. The San Diego Water Board shall apply the following procedures in determining whether a person shall be required to investigate a discharge under CWC section 13267, or to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC Code section 13304. The San Diego Water Board shall:

A. Use any relevant evidence, whether direct or circumstantial, including, but not limited to, evidence in the following categories:

1. Documentation of historical or current activities, waste characteristics, chemical use, storage or disposal information, as documented by public records, responses to questionnaires, or other sources of information;

2. Site characteristics and location in relation to other potential sources of a discharge;

3. Hydrologic and hydrogeologic information, such as the difference in upgradient and downgradient water quality;

4. Industry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills, and clarifiers;

5. Evidence of poor management of materials or wastes, such as improper storage practices or inability to reconcile inventories;

6. Lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal;

7. Physical evidence, such as analytical data, soil or pavement staining, distressed vegetation, or unusual odor or appearance;

8. Reports and complaints;

9. Other agencies' records of possible known discharge; and

10. Refusal or failure to respond to San Diego Water Board inquiries.

6.3. Campbell Industries Owned the San Diego Marine Construction Facility From 1972 Through 1979

6.3.1. Leasehold Information

Campbell through its wholly owned subsidiary San Diego Marine Construction Corporation contributed to the accumulation of pollutants in marine sediment through waste discharges from its shipyard facility located within or adjacent to the current BAE Systems leasehold between 1972 and 1979 (Woodward-Clyde, 1995).

San Diego Marine Construction Company ~~(subsequently Star & Crescent)~~ sold the business and assets of its Marine Division to MCCSD, a wholly owned subsidiary of Campbell Industries in July 1972, as indicated in the minutes of the first meeting of Directors of MCCSD approving that transaction. The purchase did not include the leasehold. San Diego Marine Construction Company surrendered its leasehold to the San Diego Unified Port District (SAR 163149), and the Port District entered into a new lease with MCCSD (SAR 174131). On September 14, 1979, San Diego Marine Construction Corporation surrendered its lease to the Port District, which entered into a new lease with Southwest Marine, Inc., now BAE Systems. On August 24, 1981, San Diego Marine Construction Corporation was merged into Campbell Industries. Campbell ceased all operations on San Diego Bay in October 1999 (SDUPD, 2004).

The stock of Campbell Industries was acquired by Marco Holdings, Inc. ("MARCO"), a Washington corporation, in 1979. Marco Holdings, Inc. is a wholly-owned subsidiary of Marine Construction and Design Company, a Washington Corporation.

On February 19, 2004 the San Diego Water Board issued Investigative Order R9-2004-0026 directing MARCO to submit a historical site assessment report that completely documented all leasehold information and activities in the vicinity of the BAE Systems leasehold that may have affected water quality, including chemical and waste handling and storage activities, discharges, and monitoring data. To date MARCO contends it has been unable to locate any responsive documents.

Further investigation by the San Diego Water Board into the ownership of San Diego Marine Construction Corporation found that:

- San Diego Marine Construction Corporation, a California corporation, was the immediate predecessor tenant to BAE Systems at the Shipyard Sediment Site, occupying the premises from July 14, 1972 until August 31, 1979. (See Appendix for Section 6, Tab A);

- San Diego Marine Construction Corporation was a wholly owned subsidiary of Campbell Industries, a California corporation and certain assets of San Diego Marine Construction Corporation were sold to BAE Systems, as stated in a resolution adopted by the directors of Campbell Industries on July 27, 1979. (See Appendix for Section 6, Tab B);

- BAE Systems commenced occupation of the shipyard on September 1, 1979, immediately following San Diego Marine Construction Corporation's surrender of its leasehold interest to the Port District. (See Appendix for Section 6, Tab C); and

- San Diego Marine Construction Corporation was merged into Campbell on August 24, 1981 (Please see Appendix for Section 6, Tabs D & E) and Campbell Industries remains an active California corporation. (See Appendix for Section 6, Tabs F & G).

Based on these considerations, the San Diego Water Board has determined that Campbell operated within the BAE Systems leasehold from 1972 through 1979.

6.4. Campbell Owned and Operated a Full Service Ship Construction, Modification, Repair, and Maintenance Facility

6.4.1. Facility Description

Campbell was a ship construction and repair facility located at the foot of Sampson Street in the City of San Diego. Ship repair facilities at Campbell included two floating dry docks and three marine railways, which together with cranes, enabled ships to be launched or repaired. The basic purpose of the dry docks was to separate the vessel from the bay to provide access to parts of the ship normally underwater. Piers were used to support berthed vessels undergoing maintenance and repair operations and berthing barges were used to house vessel crews while ship repairs were being conducted. Because dry dock space was limited and expensive, many operations were conducted pier side. Marine railways were used to wheel vessels out of water (also called dry berthing a vessel). Activities conducted on dry berthed vessels were similar to those conducted in dry docks, but usually on a much smaller scale.

6.4.2. Activities Conducted by Campbell

Ship construction and repair have many industrial processes in common, including machining and metalworking, metal plating and surface finishing, surface preparation, solvent cleaning, application of paints and coatings, and welding. Although MARCO indicated that it had no records pertaining to San Diego Marine Construction Corporation or Campbell Industries' activities, it is reasonable to assume that it~~'~~s industrial activities were typical for the ship construction and repair industry and involved a multitude of industrial processes, many of which were conducted over San Diego Bay waters or very close to the waterfront. Campbell's operations likely included the following industrial processes:

- **Surface Preparation and Paint Removal**. Methods of surface preparation and paint removal included dry abrasive blasting, wet abrasive or slurry blasting, hydroblasting, and chemical paint stripping;

- **Paint Application**. After preparation, surfaces were painted. Most painting occurred in a dry dock and involved the ship hull and internal tanks. Painting was also conducted in other locations throughout the shipyard including piers and berths. Paint application was accomplished by way of air or airless spraying equipment and was a major activity at Campbell;

- **Tank Cleaning**. Tank cleaning operations used steam to remove dirt and sludge from internal tanks, particularly fuel tanks and bilges. Detergents, cleaners, and hot water were injected into the steam supply hoses;

- **Mechanical Repair/Maintenance/Installation**. A variety of mechanical systems and machinery required repair, maintenance, and installation;

- **Structural Repair/Alteration/Assembly**. Structural repair, alteration, and assembly generally involved welding, cutting, and fastening of steel plates or assembly blocks and other industrial processes;

- **Integrity/Hydrostatic Testing**. Hydrostatic or strength testing and flushing were conducted on hulls, tanks, or pipe repairs. Integrity testing was also conducted on new systems during ship construction phases;
- **Paint Equipment Cleaning**. All air and airless paint spraying equipment was typically cleaned following use. Paint equipment cleaning was a major producer of waste, including solvents, thinners, paint wastes, and sludges;
- **Engine Repair/Maintenance/Installation**. Automotive repair, ship engine repair, maintenance, and installation generated waste oils, solvents, fuels, batteries, and filters;
- **Steel Fabrication and Machining**. Fabrication of engine and ship parts occurred at Campbell. Cutting oils, fluids, and solvents were used extensively including acetone, methyl ethyl ketone (MEK) and chlorinated solvents;
- **Electrical Repair/Maintenance/Installation**. The repair, maintenance, and installation of electrical systems involved the use of numerous hazardous materials including trichlorethylene, trichloroethane, methylene chloride, and acetone;
- **Hydraulic Repair/Maintenance/Installation**. The repair, maintenance, and installation of hydraulic systems involved the replacement of spent hydraulic oils;
- **Tank Emptying**. Bilge, fuel, and ballast tanks were typically emptied prior to ship repair activities;
- **Fueling**. Fueling operations occurred at Campbell;
- **Shipfitting**. Shipfitting was conducted at Campbell, and is defined as the forming of ship plates and shapes, etc. according to plans, patterns, or molds;
- **Carpentry**. Woodworking, with associated wood dust production, was conducted at Campbell; and
- **Refurbishing/Modernization/Cleaning**. Refurbishing, modernization, and cleaning of ships were conducted at Campbell.

6.4.3. Materials Used by Campbell Industries

Materials that were commonly used for the above listed industrial shipyard activities are summarized below. Although a few specific materials are included, the list consists primarily of major categories.

- **Abrasive Grit**. Typically slag was collected from coal-fired boilers and consisted principally of iron, aluminum, silicon, and calcium oxides. Trace elements such as copper, zinc and titanium were also likely present. Sand, cast iron, or steel shot were also used as abrasives. Enormous amounts of abrasive were needed to remove paint; for example, removing paint from a 15,000 square foot hull could take up to 6 days and consume 87 tons of grit. Grit was needed in all dry and wet abrasive blasting.

- **Paint**. Paints contained copper, zinc, chromium, and lead as well as hydrocarbons. Two major types of paints used on ship hulls were:
  - Anticorrosive Paints (primers) Vinyl, vinyl-lead, or epoxy based coatings are used. Others contained zinc chromate and lead oxide.
  - Antifouling Paints were used to prevent growth and attachment of marine organisms by continuously releasing toxic substances into the water. Cuprous oxide and tributyltin fluoride or tributyltin oxide were the principal toxicants in copper-based and organotin-based paints, respectively.
- **Miscellaneous Materials**. Oils (engine, cutting, and hydraulic), lubricants, grease, fuels, weld, detergents, cleaners, rust inhibitors, paint thinners, hydrocarbon and chlorinated solvents, degreasers, acids, caustics, resins, adhesives/cement/sealants, and chlorine.

6.4.4. Waste Generated by Campbell

Categories of wastes commonly generated by the above listed industrial shipyard activities include, but are not limited to, those listed below.

- **Abrasive Blast Water: Spent Grit, Spent Paint, Marine Organisms, and Rust**. Abrasive blast waste, consisting of spent grit, spent paint, marine organisms, and rust was generated in significant quantities during all dry or wet abrasive blasting procedures. The constituent of greatest concern with regard to toxicity is the spent paint, particularly the copper and tributyltin antifouling components, which are designed to be toxic and to continuously leach into the water. Other pollutants in paint included zinc, chromium, and lead. Abrasive blast waste was conveyed by water flows, by becoming airborne (especially during dry blasting), or by falling directly into receiving waters;

- **Fresh Paint**. Losses occurred when paint ended up somewhere other than its intended location (e.g., dry dock floor, bay, worker's clothing). These losses resulted from spills, drips, and overspray. Typical overspray losses are estimated to have been approximately 5 percent for air spraying; and 1 to 2 percent for airless spraying;

- **Bilge Waste/Other Oily Wastewater**. This waste was generated during tank emptying, leaks, and cleaning operations (bilge, ballast, fuel tanks). In addition to petroleum products (fuel, oil), tank wash water also contained detergents or cleaners and was generated in large quantities;

- **Blast Wastewater**. Hydroblasting generated large quantities of wastewater. In addition to suspended and settleable solids (spent abrasive, paint, rust, marine organisms) and water, blast wastewater also may have contained rust inhibitors such as diammonium phosphate and sodium nitrite;

- **Oils (engine, cutting, and hydraulic)**. In addition to spent products, fresh oils, lubricants, and fuels were released as a result of spills and leaks from ship or dry dock equipment, machinery, and tanks (especially during cleaning and refueling);
- **Waste Paints/Sludges/Solvents/Thinners**. These wastes were generated from cleaning paint equipment;
- **Construction/Repair Wastes and Trash**. These wastes included scrap metal, welding rods, slag (from arc welding), wood, rags, plastics, cans, paper, bottles, packaging materials, etc.; and
- **Miscellaneous Wastes**. These wastes included lubricants, grease, fuels, sewage (black and gray water from vessels or docks), boiler blowdown, condensate, discard, acid wastes, caustic wastes, and aqueous wastes (with and without metals).

The Campbell facility was located immediately adjacent to San Diego Bay. Surface water runoff from the facility, unless diverted, directly entered the bay. Wastes from the facility were conveyed to the bay by water flows, becoming airborne (especially during painting and blasting operations), or falling directly into the bay.

6.5. Campbell Discharged Waste to San Diego Bay Creating Pollution, Contamination, and Nuisance Conditions in San Diego Bay

Based on the information regarding the leasehold history and historical activities provided in Sections 6.3, 6.4, 6.6, 6.7 and 6.8 the San Diego Water Board has determined that Campbell, through it~~'~~s wholly owned subsidiary San Diego Marine Construction Corporation, is responsible for discharging pollutants to the Shipyard Sediment Site as a result of its shipyard operations on what is currently the BAE Systems leasehold. ~~CWC s~~Water Code section 13304 provides that a person who causes any waste to be discharged, or deposited where it probably will be discharged, into waters of the state creating, or threatening to create, a condition of pollution or nuisance is subject to cleaning up or abating the effects of the waste.

The Porter-Cologne Water Quality Act defines "pollution" as "an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects… …the waters for beneficial uses …"[61] "Contamination" is defined as "an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."[62]

The discharge of pollutants included heavy metals and organics, including arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc, butyl tin species, PCBs, PCTs, PAHs, and TPH. As described in other sections of this report, these same pollutants have accumulated in

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[61] Water Code section 13050(1).

[62] Water Code section 13050(k).

San Diego Bay sediment adjacent to the former Campbell facility in concentrations that adversely affect the beneficial uses of San Diego Bay and present a public health risk.

Accordingly, it is concluded that Campbell Industries, Inc., through it~~'~~s wholly owned subsidiary San Diego Marine Construction Corporation, caused or permitted waste to be discharged or deposited where it was discharged to San Diego Bay in a manner causing the creation of pollution, contamination, or nuisance conditions, and that it is appropriate for the San Diego Water Board to issue a cleanup and abatement order naming Campbell as dischargers pursuant to ~~CWC s~~Water Code section 13304.

6.6. NPDES Requirement Regulation

Waste discharges from the Campbell facility were regulated under Waste Discharge Requirements (WDRs) prescribed by the San Diego Water Board pursuant to CWA section 402 and ~~CWC s~~Water Code section 13376. These requirements are referred to as either NPDES requirements[63] or by the federal terminology "NPDES Permit." Campbell's NPDES requirements started in 1974, when the San Diego Water Board issued WDRs to regulate specific shipyard activities.

On or about July 16, 1974, Campbell submitted an NPDES Permit application to the San Diego Water Board for the discharge of pollutants to San Diego Bay from its facility at the foot of Sampson Street in the City of San Diego. The discharges to San Diego Bay subject to NPDES requirement regulation reported by Campbell included "... fouling organisms, paint, sandblasting sand and debris, oil, fuel , trash, cooling water, sewage.…"[64] On November 4, 1974, the San Diego Water Board adopted Order No. 74-84, NPDES Permit No. CA0107697, *Waste Discharge Requirements for San Diego Marine Construction Corporation*. Order No. 74-84 remained in effect for Campbell until August 31, 1979, when the facility was sold to Southwest Marine, now BAE Systems.

6.6.1. Order No. 74-84, NPDES Permit No. CA0107697

Order No. 74-84, NPDES Permit No. CA0107697 was in effect from November 4, 1974, to August 31, 1979, and contained the following finding and requirements that relate to the discussions contained herein:

- FINDING 5. During construction, repair, and cleaning operations, some pollutants, such as fouling organisms, paint, sandblasting sand and debris, oil, fuel, trash, cooling water, sewage, etc. are discharged or washed into San Diego Bay. Runoff

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[63] Pursuant to Chapter 5.5 of the Porter-Cologne Water Quality Act, to avoid the issuance by the United States Environmental Protection Agency of separate and duplicative NPDES permits for discharges in California that would be subject to the Clean Water Act, the State's Waste Discharge Requirements (WDRs) for such discharges implement the NPDES regulations and entail enforcement provisions that reflect the penalties imposed by the Clean Water Act for violation of NPDES permits issued by the U.S. EPA. Thus, the State's WDRs that implement federal NPDES regulations (NPDES requirements) serve in lieu of NPDES permits.

[64] See Finding 5 of Order No. 74-84, NPDES Permit No. CA0107697, Waste Discharge Requirements for San Diego Marine Construction Corporation adopted by the Regional Board on November 4, 1974.

of precipitation falling within the work yard, marine railways and floating dry docks also washes pollutants to San Diego Bay.

- B. PROVISIONS … 1. Neither the treatment nor the discharge of pollutants shall create a pollution, contamination or nuisance as defined in the CWC.

- B. PROVISIONS … 2. The discharger shall develop and implement a Water Pollution Control Plan, acceptable to the Executive Officer, detailing means of controlling the discharge of pollutants from each marine railway, floating dry dock and work area. The plan must address all of the following waste source categories that are generated at each facility and detail specific methods by which pollution from these sources will be controlled: trash, scale, rust, old paint, marine growths, new paint, oil and grease, sewage, wash water and cooling water. In developing the plan, the Discharger should consider methods of segregating the wastes listed above to prevent contact with precipitation and other liquids discharged to San Diego Bay, as well as methods of maintaining working areas in "broom clean" or equivalent conditions. Upon approval by the Executive Officer and the Regional Administrator, the Water Pollution Control Plan developed by the discharger shall become a condition of this permit.

- B. PROVISIONS … 3. The discharger shall comply with t he following time schedule to assure compliance with Provision B.2 of this order:

Task	Completion Date	Report of Compliance Due
Develop Water Pollution Control Plan and submit plan to the Executive Officer	2-1-75	--
Begin implementation of approved Water Pollution Control Plan	5-1-75	5-15-75
Complete implementation of approved Water Pollution Control Plan	6-1-75	6-15-75

- B. PROVISIONS … 6. This order includes Items 1, 2, 4, 5, 6, 7, 8, 9 and 10 of the attached "Standard Provisions."

  Standard Provisions … 1. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the discharger from his liabilities under federal, state, or local laws, nor guarantee the discharger a capacity right in the receiving waters. … 2. The discharge of any radiological, chemical, or biological warfare agent or high level radiological waste is prohibited. … 4. The discharger shall permit the San Diego Water Board: (a) Entry upon premises in which an effluent source is located or in which any required records are kept; (b) access to copy any records required to be kept under terms and conditions of this order; (c) inspections of monitoring equipment or records, and (d) sampling of any discharge. … 5. All discharges authorized by this order shall be consistent with the terms and conditions of this order. The discharge of any pollutant more frequently than or at a level in excess of that identified and authorized by this order shall constitute a violation of the terms and conditions of this order. … 6. The discharger shall maintain in good working order and operate as efficiently as possible any facility or control system installed by the discharger to achieve compliance with the waste discharge requirements. … 7. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of at a legal point of disposal, and in accordance with the provisions of Division 7.5 of the CWC. For that purpose of this requirement, a legal point of disposal is defined as one for which waste discharge requirements have been prescribed by a Regional Water Board and which is in full compliance therewith. … 8. After notice and opportunity for a hearing, this order may be terminated or modified for cause, including, but not limited to: (a) violation of any term or condition contained in this order; (b) obtaining this order by misrepresentation, or failure to disclose fully all relevant facts; (c) a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge. … 9. If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under section 307(a) of the Federal Water Pollution Control Act, or amendments thereto, for a toxic pollutant which is present in the discharge authorized herein and such standard or prohibition is more stringent than any limitation upon such pollutant in this order, the Board will revise or modify this order in accordance with such toxic effluent standard or prohibition and so notify the discharger. … 10. There shall be no discharge of harmful quantities of oil or hazardous substances, as specified by regulation adopted pursuant to section 311 of the Federal Water Pollution Control Act, or amendments thereto.

6.7. Industry-wide Historical Operational Practices

In November of 1997, the U.S. EPA released a study titled "EPA Office of Compliance Sector Notebook Project: PROFILE OF SHIPBUILDING AND REPAIR INDUSTRY." According to the 1995 Toxic Release Inventory (TRI) data, the reporting shipbuilding and repair facilities released and transferred 39 different TRI chemicals for a total of approximately 6.5 million pounds of pollutants during calendar year 1995. These releases and transfers were dominated by volatile organic compounds (VOCs) and metal-bearing wastes, approximately 52 percent and 48 percent, respectively (U.S. EPA, 1997c).

Releases to the air, water, and land have accounted for 37 percent (2.4 million pounds) of the reporting shipbuilding and repair facilities' total reportable chemicals. Of these releases, over 98 percent were released to the air from fugitive (74.6 percent; 1,778,818 pounds) or point (24.1 percent; 574,097 pounds) sources, while approximately 1.2 percent (29,479 pounds) was released directly to water (U.S. EPA, 1997c). However, a significant percentage of the total pollutants released as fugitive air or point air releases end up in the water, adding significantly to the 1.2 percent that is released directly to water.

VOCs accounted for about 86 percent of the reporting shipbuilding and repair facilities' reported TRI releases. Xylenes, n-butyl alcohol, toluene, methyl ethyl ketone, and methyl isobutyl ketone account for about 65 percent of the reporting shipbuilding and repair facilities' reported releases. These organic compounds are typically found in solvents that were used extensively by the industry in thinning paints and for cleaning and degreasing metal parts and equipment (U.S. EPA, 1997c).

The remainder of the releases was primarily metal-bearing wastes. Copper, zinc, and nickel-bearing wastes accounted for about 14 percent of the reporting shipbuilding and repair facilities' reported releases. These pollutants were released primarily as fugitive emissions during metal plating operations and as overspray in painting operations and could also have been released as fugitive dust emissions during blasting operations (U.S. EPA, 1997c).

6.7.1. Miscellaneous Information on Campbell Discharges

Historical operations at Campbell and its predecessor ~~Star & Crescent~~ San Diego Marine Construction Company during the years from 1914 to the late 1970's included the following (SDUPD, 2004):

- Used formaldehyde and arsenic in pretreated wood at the woodshop;
- Performed blasting, welding, and painting activities for Navy contract work in the blasting area;
- Used a dust suppression system for the blasting house, which consisted of blowers directed at the bay with a water spray to cause the blast dust to settle in the water; and
- Discharged all wastes generated on the dry dock, including blast grit, paint, etc. into the bay.

The shipyard operations that generate wastes including heavy metals and organic chemicals at Campbell and ~~Star & Crescent~~ San Diego Marine Construction Company included the following (SDUPD, 2004):

- Surface preparation and paint removal;
- Paint application;
- Tank cleaning; and
- Mechanical repair/maintenance/installation.

In 1973, an undetermined amount of fuel was released into San Diego Bay from Campbell, resulting in temporary closure of the site (SDUPD, 2004).

6.8. Sediment Core Analytical Results

The sediment core analytical results were evaluated to assess the potential presence of wastes released by Campbell. The Shipyard Report provides analytical results from sediment cores collected down to depths of approximately 6 to 8 feet (Exponent, 2003). The results from

Stations SW04, SW08 and SW17, the core locations closest to the shoreline within the former Campbell leasehold, are discussed below.

Peng et al. (2003) reports a sedimentation rate of 0.92 centimeters per year (cm/yr) at a sampling station in the vicinity of the Shipyard Sediment Site outside the former Campbell leasehold. The sedimentation rate may be higher within the leasehold closer to the shoreline since the currents may be less and the shoreline is nearer the source(s) of sediment input. Table 6-1 shows the estimated years associated with the core depths for two different sedimentation rates. A sedimentation rate of 0.92 cm/yr suggests that the sediment in the 2 to 4 foot core were deposited prior to approximately 1936. Assuming a higher sedimentation rate of 2 cm/yr indicates that the sediment in the 2 to 4 foot core was deposited from approximately 1972 to 1942.

Table 6-1 Deposition Years for Cores Based on Sedimentation Rates

Core Depth	0.92 cm/year[1]	2.0 cm/year[2]
0 to 2 feet	2002 to 1936	2002 to 1972
2 to 4 feet	1936 to 1870	1972 to 1942
4 to 6 feet	1870 to 1804	1942 to 1912

1. 0.92 cm/year corresponds to approximately 33 years per foot.
2. cm/year corresponds to approximately 15 years per foot.

The analytical results from Stations SW04, SW08 and SW17, the core locations closest to the shoreline within the former Campbell leasehold, are provided in Table 6-2 below. The analytical results for tributyltin (TBT) were used to evaluate the applicability of the two deposition rates in Table 6-1. TBT was first used as a marine antifouling coating in the 1960s (GlobalSecurity.org, 2005). Therefore TBT should not be reported in sediment deposited prior to the 1960s unless TBT in the overlying sediment contaminated the underlying sediment by mechanisms such as bioturbation or disturbances via propeller wash.

Review of the 2 to 4 foot core results presented in Table 6-2 indicates the presence of significant TBT levels. A deposition rate of 0.92 cm/yr, suggests that the sediment at 2 to 4 feet were deposited between 1936 and 1870. However the TBT concentrations suggest that the 2 to 4 foot core interval includes sediment from the late 1960s or early 1970s. Therefore it is judged that the sedimentation rate is higher than 0.92 cm/year. A deposition rate of 2 cm/year suggests that the sediment in the core from 2 to 4 feet were deposited from 1942 to 1972. These dates are consistent with presence of TBT in cores collected at those depths. Therefore, the higher deposition rate of 2 cm/year is judged to be more applicable to the Shipyard Sediment Site than the lower 0.92 cm/yr rate.

Based on this evaluation it is concluded that at least some of the pollutants in the 2 to 4 foot cores include discharges made during the time of Campbell's tenancy from 1972 to 1979. As indicated in Table 6-2, some of the highest concentrations for PCBs, benzo[a] pyrene, tributyltin, arsenic, cadmium, chromium, copper, mercury, and nickel within each core are from the 2 to 4 feet depth.

Table 6-2 Selected Results from Core Stations SW04, SW08 and SW17

Depth	Contaminant	SW04	SW08	SW17
0 to 0.06 feet	PCB homologs µg/kg	5,200	2,700	-
0 to 2 feet	PCB homologs µg/kg	1,300	10,000	1,100
2 to 4 feet	PCB homologs µg/kg	27,000	13,000	1,300
4 to 5 feet	PCB homologs µg/kg			
4 to 6 feet	PCB homologs µg/kg		490	420
6 to 6.5 feet	PCB homologs µg/kg		6.2	
0 to 0.06 feet	Benzo [a] pyrene µg/kg	2,100	3,300	-
0 to 2 feet	Benzo [a] pyrene µg/kg	1,100	2,600	1,600
2 to 4 feet	Benzo [a] pyrene µg/kg	5,800	3,000	620
4 to 5 feet	Benzo [a] pyrene µg/kg			
4 to 6 feet	Benzo [a] pyrene µg/kg		85	200
6 to 6.5 feet	Benzo [a] pyrene µg/kg		6	
0 to 0.06 feet	Tributyltin µg/kg	3,300	1,900	-
0 to 2 feet	Tributyltin µg/kg	1,900	7,000	920
2 to 4 feet	Tributyltin µg/kg	5,000	5,100	600
4 to 5 feet	Tributyltin µg/kg			
4 to 6 feet	Tributyltin µg/kg		44	57
6 to 6.5 feet	Tributyltin µg/kg		2.3	
0 to 0.06 feet	Arsenic mg/kg	73	24	-
0 to 2 feet	Arsenic mg/kg	68	24	15
2 to 4 feet	Arsenic mg/kg	110	13	15
4 to 5 feet	Arsenic mg/kg			
4 to 6 feet	Arsenic mg/kg		4.9	3.7
6 to 6.5 feet	Arsenic mg/kg		2.1	
0 to 0.06 feet	Cadmium mg/kg	1.9	0.73	-
0 to 2 feet	Cadmium mg/kg	0.79	1.1	0.68
2 to 4 feet	Cadmium mg/kg	3.2	0.86	1.4

Depth	Contaminant	SW04	SW08	SW17
4 to 5 feet	Cadmium mg/kg			
4 to 6 feet	Cadmium mg/kg		0.07	.44
6 to 6.5 feet	Cadmium mg/kg		0.03	
0 to 0.06 feet	Chromium mg/kg	80	83	-
0 to 2 feet	Chromium mg/kg	26	100	87
2 to 4 feet	Chromium mg/kg	97	110	54
4 to 5 feet	Chromium mg/kg			
4 to 6 feet	Chromium mg/kg		7.4	30
6 to 6.5 feet	Chromium mg/kg		3.7	
0 to 0.06 feet	Copper mg/kg	1,500	900	-
0 to 2 feet	Copper mg/kg	370	1,500	440
2 to 4 feet	Copper mg/kg	2,200	1,500	280
4 to 5 feet	Copper mg/kg			
4 to 6 feet	Copper mg/kg		49	530
6 to 6.5 feet	Copper mg/kg		4.2	
0 to 0.06 feet	Lead mg/kg	430	220	-
0 to 2 feet	Lead mg/kg	150	360	100
2 to 4 feet	Lead mg/kg	410	340	90
4 to 5 feet	Lead mg/kg			
4 to 6 feet	Lead mg/kg		11	23
6 to 6.5 feet	Lead mg/kg		1.8	
0 to 0.06 feet	Mercury mg/kg	1.7	2.3	-
0 to 2 feet	Mercury mg/kg	1.1	4.8	1.30
2 to 4 feet	Mercury mg/kg	7.4	6.0	0.67
4 to 5 feet	Mercury mg/kg			
4 to 6 feet	Mercury mg/kg		0.3	0.17
6 to 6.5 feet	Mercury mg/kg		0.005	
0 to 0.06 feet	Nickel mg/kg	18	21	-

Depth	Contaminant	SW04	SW08	SW17
0 to 2 feet	Nickel mg/kg	8.3	15	19
2 to 4 feet	Nickel mg/kg	40	9.1	12
4 to 5 feet	Nickel mg/kg			
4 to 6 feet	Nickel mg/kg		2.6	7.6
6 to 6.5 feet	Nickel mg/kg		1.5	
0 to 0.06 feet	Silver mg/kg	1.6	1.5	-
0 to 2 feet	Silver mg/kg	0.59	1	2.0
2 to 4 feet	Silver mg/kg	1.4	0.49	1.1
4 to 5 feet	Silver mg/kg			
4 to 6 feet	Silver mg/kg		0.03	0.29
6 to 6.5 feet	Silver mg/kg		0.01	
0 to 0.06 feet	Zinc mg/kg	3400	830	-
0 to 2 feet	Zinc mg/kg	670	1,300	500
2 to 4 feet	Zinc mg/kg	1,500	790	400
4 to 5 feet	Zinc mg/kg			
4 to 6 feet	Zinc mg/kg		34	130
6 to 6.5 feet	Zinc mg/kg		10	

(Exponent, 2003)

There are uncertainties associated with this analysis. The estimated age associated with the core depths is dependent upon the sedimentation rate. However, unless the actual sedimentation rate is significantly higher than the 0.92 cm/yr to 2 cm/yr rates discussed above, it is likely that the sediment below 2 feet were deposited before 1979, which was during Campbell's occupancy of the leasehold. Physical disturbances, such as bioturbation, dredging, and propeller wash, also introduce uncertainty into this interpretation. For example, if propeller wash from ship movements removes material from the bottom, the shallow sediment may be older than that indicated by applying the sedimentation rate. If disturbances result in re-deposition of older sediment on top of newer sediment, the shallow sediment may be older than interpreted.

The Shipyard Report uses the presence of graded bedding in the sediment profiles to identify areas of no apparent physical disturbance. Stations SW08 and SW17 were reported to be stations with no apparent physical disturbance (Exponent, 2003). Therefore, assuming a deposition rate of 2 cm/yr or less, the pollutants reported in the sediment below 2 feet at Stations SW08 and

SW17 include discharges between 1972 and 1979, and include wastes discharged by Campbell during its tenancy from 1972 to 1979.

7. Finding 7: Chevron, A Subsidiary of ChevronTexaco

Finding 7 of CAO No. ~~R9-2011-0001~~R9-2012-0024 states:

Chevron, a subsidiary of ChevronTexaco (hereinafter, Chevron) owns and operates the Chevron Terminal, a bulk fuel storage facility currently located at 2351 East Harbor Drive in the City of San Diego adjacent to the NASSCO and BAE Systems leaseholds. Fuel products containing petroleum hydrocarbons have been stored at the Chevron Terminal since the early 1900s at both the currently operating 7 million gallon product capacity upper tank farm and the closed 5 million gallon capacity lower tank farm. Based on the information that the San Diego Water Board has reviewed to date, there is insufficient evidence to find that discharges from the Chevron Terminal contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, which create, or threaten to create, conditions of pollution or nuisance. Accordingly, Chevron is not referred to as "Discharger(s)" in this CAO.

7.1. Jurisdiction

~~CWC s~~Water Code section 13304 contains the cleanup and abatement authority of the San Diego Water Board. Section 13304(a) provides in relevant part that the San Diego Water Board may issue a cleanup and abatement order to any person "who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirements ... or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance…."

For the reasons set forth below, the San Diego Water Board has determined that Chevron, a subsidiary of ChevronTexaco, should not be named as a discharger in Cleanup and Abatement Order No. R9-~~2010-0002~~2012-0024 because there is insufficient evidence to find that discharges from the Chevron Terminal contributed to the accumulation of pollutants in the marine sediment at the Shipyard Sediment Site to levels, which create, or threaten to create, conditions of pollution or nuisance.

7.2. Admissible Evidence – State Water Resources Control Board Resolution No. 92-49

On June 18, 1992 (amended on April 21, 1994 and October 2, 1996) the State Water Board adopted Resolution No. 92-49, *Policies And Procedures For The Investigation And Cleanup And Abatement Of Discharges Under Water Code Section 13304*. Resolution No. 92-49 provides in part that:

VI. The San Diego Water Board shall apply the following procedures in determining whether a person shall be required to investigate a discharge under CWC section 13267, or to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC section 13304. The San Diego Water Board shall:

A. Use any relevant evidence, whether direct or circumstantial, including, but not limited to, evidence in the following categories:

1. Documentation of historical or current activities, waste characteristics, chemical use, storage or disposal information, as documented by public records, responses to questionnaires, or other sources of information;

2. Site characteristics and location in relation to other potential sources of a discharge;

3. Hydrologic and hydrogeologic information, such as the difference in upgradient and downgradient water quality;

4. Industry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills, and clarifiers;

5. Evidence of poor management of materials or wastes, such as improper storage practices or inability to reconcile inventories;

6. Lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal;

7. Physical evidence, such as analytical data, soil or pavement staining, distressed vegetation, or unusual odor or appearance;

8. Reports and complaints;

9. Other agencies' records of possible known discharge; and

10. Refusal or failure to respond to San Diego Water Board inquiries.

7.3. Chevron, A Subsidiary of ChevronTexaco

Chevron companies (including Standard Oil Company and Chevron Products Company) have operated bulk fuel storage terminal #100-1252 (Chevron Terminal) since the early 1900s. The Chevron Terminal current address is 2351 East Harbor Drive in the City of San Diego. Fuel products containing petroleum hydrocarbons have been stored at Chevron Terminal at both the currently operating 7 million gallon product capacity upper tank farm and the closed 5 million gallon capacity lower tank farm and relocated lower tank farm. In addition to the tank farms, the Chevron Facilities formerly included a fueling pier, wharf, petroleum warehouse, and associated pipelines. Details regarding current and historical activities are provided in Section 7.4 below.

Chevron submitted a Technical Data Report (LFR Report) and the report "Evaluation of Polynuclear Aromatic Hydrocarbons and Metals in the San Diego Shipyard Site Sediments" (List Report) in response to San Diego Water Board Investigation Orders No. R9-2004-0026 and R9-2004-0027 (LFR Levine-Fricke, 2004; List, 2005). The LFR Report provides information regarding current and historical activities associated with the Chevron Terminal. The List Report evaluates the PAHs and metals in the sediment to identify likely sources. The List Report is discussed below in Section 7.11 Analyses and Evaluations of Petroleum Hydrocarbons.

7.4. Current and Historical Activities

Chevron's operations have involved the transport, handling, and use of a wide variety of chemicals including premium unleaded gasoline, mid-grade unleaded gasoline, regular unleaded gasoline, product contact water, transmix, generic additive, techron additive, diesel fuel, ethanol, jet fuel, solvent, household cleaning products, motor oil, engine coolant, paint, thinner, lube oil, stove oil, Stoddard solvent, aviation gasoline, pearl oil, distillate oil, and black oil (SDUPD, 2004).

Chevron formerly operated bulk fuel storage and transfer operations at locations on the current NASSCO property and adjacent to the BAE Systems property (LFR Levine-Fricke, 2004). The relocated lower tank farm was adjacent to the BAE Systems leasehold and approximately 100 feet from San Diego Bay. According to information provided by Chevron, their former operations on the NASSCO property included a fueling pier (National Steel Marine Terminal Pier 1) in San Diego Bay, the former relocated tank farm, and associated pipelines from the fueling pier to the tank farm (LFR Levine-Fricke, 2004). Chevron leased a portion of the area between the Chevron Terminal and San Diego Bay for operation of the fueling pier and pipeline connecting the pier to the current and former tank farms from approximately 1920 to 1974. The Chevron Report refers to this as the wharf lease.

Storm water flows from the Chevron 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. Petroleum hydrocarbons from tanks and/or piping releases have been found in soil and ground water at the upper and the former lower tank farms. The regional groundwater gradient is generally towards San Diego Bay. Over 30 ground water monitoring wells have been installed by Chevron to investigate the impacts to groundwater in the vicinity of their current and former tank farms. The monitoring results indicate that the groundwater contamination does not extend to San Diego Bay (LFR Levine-Fricke, 2004).

7.5. NPDES Requirement Regulation

Waste discharges from the Chevron Terminals facility have been regulated since 1974 under Waste Discharge Requirements (WDRs) prescribed by the San Diego Water Board pursuant to CWA section 402 and ~~CWC s~~Water Code section 13376. These requirements are referred to as either NPDES requirements or by the federal terminology "NPDES Permit." Chevron currently discharges storm water runoff from Chevron Terminal to San Diego Bay at the Shipyard Sediment Site subject under the terms and conditions of the statewide Industrial NPDES Storm Water Permit. The San Diego Water Board conducted a file review and determined that no significant NPDES requirement violations occurred at the Chevron Terminal facility during the period when it was subject to NPDES requirement regulation. Table 7-1, below, summarizes the NPDES Requirement history for the Chevron Terminal.

Table 7-1 Chevron NPDES Permits

Order Number / NPDES No.	Title	Adoption Date	Expiration Date
Order No. 74-38, NPDES Permit No. CAS0107476	Waste Discharge Requirements for a Discharge of Storm Water Runoff from a Petroleum Storage Area through a City of San Diego Storm Drain Terminating in San Diego Bay, 350 feet south of the Extension of Sampson Street	November 4, 1974	June 25, 1979
Order No. 79-42, NPDES Permit No. CAS0107476	(same as above)	June 25, 1979	July 16, 1984
Order No. 84-26, NPDES Permit No. CA01074761	(same as above)	July 16, 1984	March 10, 1994
Order No. 94-30, NPDES Permit No. CA0107476	An Order Rescinding Order No. 84-26	March 10, 1994	Order No. 94-30 rescinds Order No. 84-26 since facility discharge is covered by statewide General Industrial Storm Water Permit, Order No. 91-13
Order No. 91-13, NPDES Permit No. CAS000001	Waste Discharge Requirements (WDRs) For Discharge Of Storm Water Associated With Industrial Activities Excluding Construction Activities (Statewide General Industrial Storm Water Permit)	June 8, 1992	February 5, 1998
Order No. 97-03-DWQ, NPDES Permit No. CAS000001	Waste Discharge Requirements (WDRs) For Discharge Of Storm Water Associated With Industrial Activities Excluding Construction Activities	February 5, 1998	Ongoing

7.6. Documented Releases

The following is a summary of the documented releases of petroleum related products from the Chevron facility.

7.6.1. Belt Street Pipeline

On February 1, 2001, the Belt Street Pipeline was ruptured during geotechnical drilling activities for a City of San Diego water project. The drilling was performed by AMEC Earth and Environmental Inc., under contract with the City of San Diego. An estimated 3,000 to 4,000 gallons of gasoline were released (SDUPD, 2004). When neither the City nor AMEC would accept responsibility for the cleanup efforts, Chevron implemented a dual phase extraction

(DPE) system at NAS-1 with the use of a thermal oxidizing Mobile Treatment System (MTS). Chevron commenced with the cleanup effort to ensure that there was no adverse effect to San Diego Bay as a result of the pipeline rupture. The San Diego Water Board ultimately issued a Cleanup and Abatement Order to the City of San Diego and AMEC. As a result of the emergency response actions taken by Chevron, and the assessment work performed by the City and/or AMEC, the San Diego Water Board ultimately issued a "no further action" letter to the City and AMEC, dated August 21, 2003 (LFR Levine-Fricke, 2004).

7.6.2. Upper Tank Farm

The Upper Tank Farm area has three documented releases. Most recently, on April 30, 1973, an evidence of an estimated 200 gallons of petroleum was found on the surface of San Diego Bay. The San Diego Water Board identified the Chevron facility as the likely source of the release (SDUPD, 2004). Chevron stated that the investigation was incomplete because 1) Terminal drains were dry at the time of the release, 2) there was no direct evidence of a spill on the Chevron property, 3) there were five openings on the drain line to the Bay, which were not on Chevron Property, but on public streets, and 4) there were no updated drawings which show the drain system does not extend beyond the Chevron property limit (LFR Levine-Fricke, 2004).

On August 14, 1967, an estimated 400-gallon release of diesel fuel due to a leak in a filter gasket was reported by terminal personnel. No further information is available to determine whether the spill reached San Diego Bay. (LFR Levine-Fricke, 2004)

Historical records maintained by the San Diego Fire Department contain a summary of a fire at the Chevron associated facility (originally owned by Standard Oil) in October 1913. A spark from a passing locomotive was reportedly the cause of the fire in a 250,000-gallon tank of distillate oil. This caused a second fire in a 1,500,000-gallon tank of black oil resulting in the explosion of a third, 250,000-gallon tank containing gasoline. The explosion reportedly spread burning gasoline to nearby lumberyards that caught fire as well. The fire burned for 35 hours before it was extinguished. Reportedly the total estimated two million gallons of crude oil and leaded gasoline were destroyed by the fire and/or released into the San Diego Bay. According to the San Diego Union, the burning oil spread out over the bay and nearby lumberyards. (SDUPD, 2004)

7.7. Dredge and Fill Reclamation Projects

Much of the current land area of the NASSCO and BAE Systems leaseholds was created during a major dredge and fill project completed between 1935 and 1936 (SDUPD, 2004). A bulkhead was used to retain the dredged sediment, creating additional land area. It is likely that contaminated sediment present within the dredge and fill areas, such as any that resulted from the 1913 fire, are buried within the fill area behind the bulkhead.

7.8. Petroleum and Ethanol Storage and Handling

Petroleum products are delivered to the Chevron facility via an underground pipeline owned and operated by Kinder Morgan Energy Partners. The pipeline surfaces before it enters the tank farm. The petroleum is transferred to the aboveground storage tanks (ASTs) within the containment walls of the tank farm, and it is transferred to tanker trucks via aboveground piping. Storm water from the tank farm is collected in an underground storage tank, sent to a clarifier for processing, and only then discharged to the storm sewer system (LFR Levine-Fricke, 2004).

Ethanol is transferred directly from railcars to the facility on the day of arrival via aboveground piping. Terminal personnel manually connect the tank cars before the transfer is started and are present during the transfer. The ethanol facility, which includes a rail spur, is underlain by a double containment system designed to capture any accidental releases of ethanol during off-loading operations (LFR Levine-Fricke, 2004).

7.9. Comparison of Shipyard Sediment Data to Location of Chevron Facilities

The former Chevron fueling pier, now known as the National Steel Marine Terminal Pier 1, is located near the boundary between BAE Systems and NASSCO, and south of BAE Systems Pier 4. The Shipyard Report (Exponent, 2003) sediment sampling sites SW20 through SW25 are located between BAE Systems' Piers 3 and 4 (which is northwest of the Chevron Lower Tank Farm site).

Review of the shipyard sediment sampling data for high molecular weight PAHs (HPAHs) shows that some of the highest concentrations are north of the former Chevron fueling pier (National Steel Marine Terminal Pier 1) and both lower tank farms (Exponent, 2003). Table 7-2 shows the HPAH sampling results for selected sampling stations in the vicinity of the Chevron facilities and in the vicinity of the mouth of Chollas Creek. For comparison purposes the background sediment concentration for HPAHs is 673 µg/kg.

Table 7-2 Sediment Sampling Results for HPAHs

Station	Depth (Feet)	HPAH (µg/kg)	Station Location Description
SW 20	Surface 0 – 1.5 1.5 – 2.42	11,000 6,300 400	Approximately 200 feet southwest of the former Chevron lower tank farm.
SW 24	Surface 0 – 2 2 – 3	58,000 17,000 2,900	Approximately 270 feet southwest of the former Chevron lower tank farm.
SW 27	Surface 0 – 2 2 – 4.24 5.29 – 5.6	12,000 3,800 630 37	Approximately 260 feet southwest of the Standard Oil pipelines.
SW 28	Surface 0 – 2 2 – 4 4 – 5.29	20,000 25,000 8,700 1,900	Approximately 100 feet southwest of the Standard Oil pipelines and approximately 300 feet west of the former fueling pier.
NA 01	Surface 0 – 2 2 – 4 5 – 5.5	7,400 7,200 9,100 8,800	Less than 100 feet west of the mid-point of the former fueling pier.
NA 23	Surface 0 – 2 2 – 4	3,400 8,500 4,200	Approximately 100 feet south of the Chevron wharf lease and approximately 300 feet east of the fueling pier and pipelines.
NA 20	Surface 0 – 2 2 – 4 4 – 6 6 – 8.1	2,900 2,400 4,000 2,500 1,200	Near mouth of Chollas Creek

Station	Depth (Feet)	HPAH (µg/kg)	Station Location Description
NA 21	Surface	2,100	Near mouth of Chollas Creek
	0 – 2	6,100	
	2 – 4	3,200	
	4 – 6	460	
	6 – 7.6	<15	
Background	NA	673	Based on 95% upper prediction limit of reference stations

(Exponent, 2003; LFR Levine-Fricke, 2004)

The Table 7-2 data indicates that:

- Stations SW20 through SW24, located closest to the former Chevron lower tank farm (between Piers 3 and 4), have considerably higher HPAH results than the stations located closest to the mouth of Chollas Creek for most depth intervals. This suggests source(s) other than Chollas Creek have made significant contributions to the accumulation of HPAHs reported in the stations near the former Chevron operations.

- The second highest surface sediment HPAH concentration for the entire Shipyard Sediment Site was reported for station SW24 (58,000 µg/kg).

Sediment deposition and erosional processes in the vicinity of the Shipyard Sediment Site are not well known. Very little evidence of maintenance dredging in the northern portion of the NASSCO lease area has been found in documents, although the nearby area between BAE Systems Piers 1 through 4 was dredged in 1984. It is likely that this dredging removed some of the petroleum hydrocarbon-impacted sediment deposited prior to 1984. Chevron ceased operations at the National Steel Marine Terminal 1 (south of BAE Systems Pier 4) in 1974 (LFR Levine-Fricke, 2004).

7.10. Properties and Sources of Polynuclear Aromatic Hydrocarbons

PAHs are a class of compounds that occur naturally in fossil fuels such as coal and crude oil. PAHs are also present in refined petroleum products including diesel fuel and fuel oil. The PAH make-up of crude oil and refined petroleum products is highly complex and variable and no two sources have the same composition (Nagpal, 1993). Physical and chemical properties of PAHs vary with molecular weight. The solubility in water decreases as the molecular weight increases. Accordingly, PAHs of different molecular weight vary in their behavior and distribution in the environment and in biological effects. For aquatic biota, toxicity increases as molecular weight increases (Eisler, 1987). High molecular weight PAHs (HPAHs) include benzo[a] pyrene.

Benzo[a] pyrene has carcinogenic properties and, because of this, is frequently used as an indicator of PAHs (Eisler, 1987).

Major sources of PAHs in the atmosphere include forest and prairie fires (19,513 metric tons), agricultural burning (13,009 metric tons), and refuse burning (4,769 metric tons). The major sources of PAHs to aquatic environments are petroleum spillage (170,000 metric tons) and atmospheric deposition (50,000 metric tons) (Eisler, 1987).

When released to the environment, PAHs become associated with particulate materials. PAHs released into the atmosphere eventually reach the ground as the particles they attach to are deposited. PAHs released in petroleum spills enter the aquatic environment, either directly or via runoff, where they become incorporated into bottom sediment, concentrate in aquatic biota, or experience chemical oxidation and biodegradation (Eisler, 1987).

7.11. Analyses and Evaluations of Petroleum Hydrocarbons

The List Report, submitted by Chevron, states that "chemical analyses of sediment samples taken at the Shipyard Sediment Site … have shown that the high molecular weight polynuclear aromatic hydrocarbons (HPAHs) found in those sediments cannot be traced to products stored, transferred or distributed by Chevron at its San Diego Terminal." (List, 2005). Chevron reports that, based on independent and Chevron proprietary product analyses, the HPAHs present in the sediment are not present in the Chevron products at the site. Their report suggests that the HPAHs are of coal tar origin.

BP submitted the report "Forensic Geochemical Analysis of TPH and PAH Data Collected from Sediments at BAE Systems, San Diego, CA" (Haddad Report) (Haddad, 2005). The Haddad Report states that the TPH and PAH contamination "could not have come from BP Terminal operations." The report's conclusions are based their analysis of the data provided in the Shipyard Report (Exponent, 2003). TPH carbon range-based quantifications were used the analysis. The analysis also included using PAH "fingerprinting" and the fact that there are two basic types of PAHs: parent PAHs and alkylated PAHs. Comparisons of the PAH "fingerprints" and TPH carbon ranges were used in the Haddad Report to conclude that the hydrocarbons in shipyard sediment are from pyrogenic sources, not petrogenic sources. PAHs from petrogenic sources would provide evidence of a possible release of PAHs from a bulk storage terminal.

Using the molecular weight technique, TPH can be categorized as gasoline range organics (GRO), diesel range organics (DRO), or residual range organics (RRO). Some petroleum products can fall into more than one category. By graphing the spectrum of molecular weights, a curve of each product or mixture of products, can be generated. GRO was found in inconsiderable amounts in sediment samples with only one detection in over 80 sediment samples. Elevated concentrations of DRO were found in near-shore sediment, while RRO concentrations were found near the northwest corner of the sampling area (at sampling stations SW01 and SW02) and near storm water outfalls. The lack of GRO in samples suggests sources other than the refined products in the Chevron and BP facilities (Haddad, 2005).

The fingerprinting technique separates the PAHs into six homologous PAH families: naphthalenes, flourenes, dibenzothiophenes, anthracenes/phenanthrenes, fluoranthenes/pyrenes, and chrysenes. Each family is composed of a parent PAH, with no carbon atoms attached to their rings, and the alkylated PAHs with 1 to 4 carbon atoms attached to the parent rings. The amount of each type of PAH found in a sample is then plotted on a graph and grouped according to family. The PAHs can then be grouped according to whether the sample of petroleum product is a petrogenic or pyrogenic sources. Petrogenic sources are derived from petroleum products that have not been exposed to high temperatures such as the petroleum products in storage at the Chevron and BP Terminals. Pyrogenic sources are derived from high temperature processes, and include atmospheric deposition/urban runoff, automobile combustion products, creosote, coal tar, etc. (Haddad, 2005).

The fingerprinting results indicate that the samples collected near the BP and Chevron facilities are composed mainly of pyrogenic sources, thereby excluding the fuels stored at the Chevron and BP Terminals as a possible source of the petroleum hydrocarbons found in bay sediment. One sampling event at sampling station SW24 in August 2002 did show the presence of a petrogenic source, however samples taken before and after this sampling event at the same sampling station did not indicate any petrogenic source product present (Haddad, 2005). Chevron has not used the pier/wharf near the sampling site since 1974, and therefore, is a highly unlikely source of the PAHs found in the sediment during this one sampling event.

Creosote impregnated marine pilings have been shown to be a significant source of PAH contamination in San Diego Bay (Chadwick et al., 1999). At the San Diego Naval Station south of the Shipyard Sediment Site, the Navy has been mitigating the effects of the creosote pilings by replacing them with plastic ones. There are numerous creosote pilings within the Shipyard Sediment Site. Review of a 1942 aerial photograph show several piers, very likely constructed with creosote pilings, in the vicinity of sampling stations SW20 through SW24, SW27, and SW28 listed in Table 7-2 as having some of the highest reported HPAH concentrations. Many of the old piers at the Shipyard Sediment Site have been removed over the long history of shipyard activities. Pyrogenic PAHs can be released from creosote pilings via leaching or by deterioration from ship and boat contact or during removal.

Based on the information that the San Diego Water Board has reviewed to date, it is likely that most of the PAH contamination present at the Shipyard Sediment Site is of pyrogenic origin and not caused by releases from the Chevron Terminal. Potential sources for the pyrogenic PAHs include vehicle combustion products transported via air deposition and/or storm water runoff, and creosote pilings.

8. Finding 8: BP as the Parent Company and Successor to Atlantic Richfield Company

Finding 8 of CAO No. ~~R9-2011-0001~~R9-2012-0024 states:

BP owns and operates the Atlantic Richfield Company (ARCO) Terminal, a bulk fuel storage facility with approximately 9 million gallons of capacity located at 2295 East Harbor Drive in the City of San Diego. Fuel products containing petroleum hydrocarbons and related constituents such as PAHs have been stored at ARCO Terminal since the early 1900s. ARCO owned and operated ancillary facilities include a wharf, fuel pier (currently BAE Systems Pier 4), and a marine fueling station used for loading and unloading petroleum products and fueling from 1925 to 1978, and five pipelines connecting the terminal to the pier and wharf in use from 1925 to 1978. Storm water flows from ARCO Terminal enter a City of San Diego MS4 storm drain that terminates in San Diego Bay in the Shipyard Sediment Site approximately 300 feet south of the Sampson Street extension. Based on the information that the San Diego Water Board has reviewed to date, there is insufficient evidence to find that discharges from the ARCO Terminal contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, which create, or threaten to create, conditions of pollution or nuisance. Accordingly, BP and ARCO are not referred to as "Discharger(s)" in this CAO.

8.1. Jurisdiction

~~CWC~~ Water Code section 13304 contains the cleanup and abatement authority of the San Diego Water Board. Section 13304(a) provides in relevant part that the San Diego Water Board may issue a cleanup and abatement order to any person "who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirements ... or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance…."

For the reasons set forth below, the San Diego Water Board has determined that BP and its predecessor and subsidiary companies, including Atlantic Petroleum, Richfield Oil Company, Richfield Petroleum, Atlantic Richfield, and ARCO Chevron, a subsidiary of ChevronTexaco, should not be named as dischargers in Cleanup and Abatement Order No. R9-~~2010-0002~~2012-0024 because there is insufficient evidence to find that discharges from the ARCO Terminal contributed to the accumulation of pollutants in marine sediment at the Shipyard Sediment Site to levels, which create, or threaten to create, conditions of pollution or nuisance.

8.2. Admissible Evidence – State Water Resources Control Board Resolution No. 92-49

On June 18, 1992 (amended on April 21, 1994 and October 2, 1996), the State Water Board adopted Resolution No. 92-49, *Policies And Procedures For The Investigation And Cleanup And Abatement Of Discharges Under Water Code Section 13304*. Resolution No. 92-49 provides in part that:

VII. The San Diego Water Board shall apply the following procedures in determining whether a person shall be required to investigate a discharge under CWC section 13267, or to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC section 13304. The San Diego Water Board shall:

A. Use any relevant evidence, whether direct or circumstantial, including, but not limited to, evidence in the following categories:

1. Documentation of historical or current activities, waste characteristics, chemical use, storage or disposal information, as documented by public records, responses to questionnaires, or other sources of information;
2. Site characteristics and location in relation to other potential sources of a discharge;
3. Hydrologic and hydrogeologic information, such as the difference in upgradient and downgradient water quality;
4. Industry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills, and clarifiers;
5. Evidence of poor management of materials or wastes, such as improper storage practices or inability to reconcile inventories;
6. Lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal;
7. Physical evidence, such as analytical data, soil or pavement staining, distressed vegetation, or unusual odor or appearance;
8. Reports and complaints;
9. Other agencies' records of possible known discharge; and
10. Refusal or failure to respond to San Diego Water Board inquiries.

8.3. Current and Historical Activities

BP or its predecessor and subsidiary companies, including Atlantic Petroleum, Richfield Oil Company, Richfield Petroleum, Atlantic Richfield, and ARCO, have owned or operated bulk fuels storage and distribution facilities in the vicinity of the Shipyard Sediment Site since approximately 1925. ARCO has submitted a Historical Site Assessment Report (ARCO Report) in response to San Diego Water Board Investigation Order No. R9-2004-0026 (SECOR, 2004).

The following is a summary of the current and historical facilities and activities associated with the ARCO bulk fuels storage and distribution terminal located at 2995 East Harbor Drive in San Diego, California. This information is based in part on reports provided by ARCO/ BP and the Port District (SECOR, 2004; Haddad, 2005; Woodward-Clyde, 1995).

- In 1925 Richfield Oil Company purchased property on the southwest corner of Sicard Street and Harbor Drive for use as a petroleum terminal. By 1928 the terminal property was developed with buildings and large above ground storage tanks (ASTs).
- Five pipelines ran from the terminal to a fueling pier approximately 700 feet long (currently BAE Systems Pier 4). This area is referred to as the wharf area.
- The fueling pier was used to transfer refined petroleum products from barges to the terminal and for the sale of petroleum products at their marine fueling station.
- The pipelines, fueling pier, and wharf were used for loading and unloading petroleum products from approximately 1925 to 1978.
- The terminal was adjacent to San Diego Bay until the 1930s when dredge material was used to expand the land area with fill, effectively moving the shoreline from what is now approximately Belt Street to the current configuration. As a result of the land area expansion the terminal is now located approximately 700 feet from San Diego Bay.
- Richfield Oil Company had a lease in 1948 (renewed in 1955, 1963, and 1978) with Standard Oil to use Standard Oil's wharf, mooring facilities, and pipelines, and for the right to connect to Standard's pipelines (SECOR, 2004).
- The products handled at the wharf and/or stored at the terminal included gasoline, diesel fuels and stove oil, fuel oils, jet fuel, kerosene, and ethanol (SECOR, 2004).
- Storage and handling of jet fuel (kerosene) was discontinued in 2001.
- Waste product and other liquid wastes at the ARCO Terminal are stored in a waste product tank and periodically trucked off-site for recycling and/or treatment and disposal.

8.4. Storm Water Discharges

Storm water flows from ARCO Terminal enter a City of San Diego MS4 storm drain that terminates at outfall SW4 in San Diego Bay in the Shipyard Sediment Site approximately 300 feet south of the Sampson Street extension. Product storage and handling at the BP facility is currently managed under a Spill Prevention Control and Countermeasure Plan as required by the U.S. EPA. The plan has been implemented by using such measures as secondary containment, tank inspection, and collection sumps, which have been in place since at least 1983. The entire tank farm is bermed with storm water flowing into a drainage basin located on the southern corner of the facility. Storm water from the facility has been sampled and analyzed before it is discharged since the early 1990s as required by law, and prior to that, it was visually inspected for floating hydrocarbons before discharged (SECOR, 2004).

8.5. NPDES Requirement Regulation

Since 1992 waste discharges from the ARCO Terminal facility have been regulated under Waste Discharge Requirements (WDRs) prescribed by the San Diego Water Board pursuant to CWA section 402 and ~~CWC~~ Water Code section 13376. These requirements are referred to as NPDES requirements. BP currently discharges storm water runoff from ARCO Terminal to San Diego Bay at the Shipyard Sediment Site subject under the terms and conditions of the statewide Industrial NPDES Storm Water Permit.

The table below summarizes the NPDES requirement history for the ARCO Terminal.

Table 8-1 ARCO Terminal Facility NPDES Permits

Order Number / NPDES No.	Title	Adoption Date	Expiration Date
Order No. 91-13, NPDES Permit No. CAS000001,	Waste Discharge Requirements (WDRs) For Discharge Of Storm Water Associated With Industrial Activities Excluding Construction Activities (Statewide General Industrial Storm Water Permit)	June 8, 1992	February 5, 1998
Order No. 97-03-DWQ, NPDES Permit No. CAS000001	Waste Discharge Requirements (WDRs) For Discharge Of Storm Water Associated With Industrial Activities Excluding Construction Activities	February 5, 1998	Ongoing

8.6. Documented Releases

The following is a summary of the documented releases of petroleum related products from the ARCO Terminal (SECOR, 2004).

In 1992, soil and groundwater contamination was identified at the terminal. To date more than 30 ground water monitoring wells have been installed with liquid phase hydrocarbons (LPH) identified in approximately 12 wells. A Corrective Action Plan recommending vapor extraction and natural attenuation was approved by the San Diego County Department of Environmental Health in February 1997. The remediation system was installed and started in 1998. Manual and active LPH recovery activities since 1992 have resulted in the recovery of approximately 3,147 gallons (SECOR, 2004).

On January 15, 1997, approximately 95 gallons of jet fuel was released. A contractor removed product with a vacuum truck and excavated approximately three cubic yards of soil and gravel. The spill was within the area of influence of the vapor extraction system and therefore incorporated into the system.

On August 7, 1998, approximately 700 gallons of gasoline were released at the terminal near the vapor recovery system at the southwest portion of the site during a Kinder Morgan Pipeline leak. Approximately 100 gallons of product and 80 tons of impacted soil were removed. Soil sampling was conducted to assess the hydrocarbon concentrations left in place after the excavation.

The SECOR report concludes that "…hydrocarbon-impacted soil at the Terminal is generally limited to the property boundaries with limited off-site impact (<100 feet) towards San Diego Bay" and that "…the Terminal-associated LPH and dissolved hydrocarbon plumes are predominately present below the southern and southwestern portions of the Terminal with limited off-site migration (<100 feet) towards San Diego Bay, which is located approximately 750 feet southwest of the site." (SECOR, 2004)

8.7. Properties and Sources of Polynuclear Aromatic Hydrocarbons

PAHs are a class of compounds that occur naturally in fossil fuels such as coal and crude oil. PAHs are also present in refined petroleum products including diesel fuel and fuel oil. The PAH make-up of crude oil and refined petroleum products is highly complex and variable and no two sources have the same composition (Nagpal, 1993). While lighter diesel fuels typically contain less than five percent PAHs, marine diesel fuel may contain as high as ten percent PAHs (IARC, 1989).

Physical and chemical properties of PAHs vary with molecular weight. The solubility in water decreases as the molecular weight increases. Accordingly, PAHs of different molecular weight vary in their behavior and distribution in the environment and in biological effects. For aquatic biota, toxicity increases as molecular weight increases (Eisler, 1987). High molecular weight PAHs (HPAHs) include benzo[a]pyrene (BAP). BAP has carcinogenic properties and because of this it is frequently used as an indicator of PAHs (Eisler, 1987).

Major sources of PAHs in the atmosphere include forest and prairie fires (19,513 metric tons), agricultural burning (13,009 metric tons), and refuse burning (4,769 metric tons) (Eisler, 1987). The major sources of PAHs to aquatic environments are petroleum spillage (170,000 metric tons) and atmospheric deposition (50,000 metric tons) (Eisler, 1987).

When released to the environment, PAHs become associated with particulate materials. PAHs released into the atmosphere eventually reach the ground as the particles they attach to are deposited. PAHs released in petroleum spills enter the aquatic environment, either directly or via runoff, where they become incorporated into bottom sediment, concentrate in aquatic biota, or experience chemical oxidation and biodegradation (Eisler, 1987).

8.8. Comparison of Shipyard Sediment Data to Location of ARCO/BP Facilities

The former ARCO fueling pier is now known as BAE Systems Pier 4. The Shipyard Report (Exponent, 2003) sediment sampling sites SW20 through SW25 are located between Piers 3 and 4 (which is immediately west of the ARCO/BP tank farm).

Review of the shipyard sediment sampling data for high molecular weight PAHs (HPAHs) shows that some of the highest concentrations are in the vicinity of the former ARCO fueling wharf (between Piers 3 and 4), which seems to be associated with piping within their wharf lease (Exponent, 2003). Table 8-2 shows the HPAH sampling results for selected sampling stations in the vicinity of the ARCO facilities and in the vicinity of the mouth of Chollas Creek. For comparison purposes the background sediment concentration for HPAHs is 673 µg/kg.

Table 8-2 Sediment Sampling Results for HPAHs

Station	Depth (feet)	HPAH (µg/kg)	Station Location Description
SW 20	Surface 0 – 1.5 1.5 – 2.42	11,000 6,300 400	Approximately 275 feet north of the former ARCO fueling wharf.
SW 24	Surface 0 – 2 2 – 3	58,000 17,000 2,900	Approximately 150 feet north of the former ARCO fueling wharf.
SW 27	Surface 0 – 2 2 – 4.24 5.29 – 5.6	12,000 3,800 630 37	Approximately 200 feet south of the former ARCO fueling wharf.

Station	Depth (feet)	HPAH (µg/kg)	Station Location Description
SW 28	Surface 0 – 2 2 – 4 4 – 5.29	20,000 25,000 8,700 1,900	Approximately 200 feet southeast of the former ARCO fueling wharf.
NA 01	Surface 0 – 2 2 – 4 5 – 5.5	7,400 7,200 9,100 8,800	Less than 100 feet west of the mid-point of the former Chevron fueling pier.
NA 23	Surface 0 – 2 2 – 4	3,400 8,500 4,200	Approximately 100 feet south of the Chevron wharf lease and approximately 300 feet east of the fueling pier and pipelines.
NA 20	Surface 0 – 2 2 – 4 4 – 6 6 – 8.1	2,900 2,400 4,000 2,500 1,200	Near mouth of Chollas Creek
NA 21	Surface 0 – 2 2 – 4 4 – 6 6 – 7.6	2,100 6,100 3,200 460 < 15	Near mouth of Chollas Creek
Background	NA	673	Based on 95 % upper prediction limit of reference stations

(Exponent, 2003; LFR Levine Fricke, 2004)

The Table 8-2 data indicates the following:

- Stations SW20 through SW24, located closest to the former ARCO wharf/pier (between BAE Systems Piers 3 and 4), have considerably higher HPAH results than the stations located closest to the mouth of Chollas Creek for most depth intervals. This suggests source(s) other than Chollas Creek have made significant contributions to the accumulation of HPAHs reported in the stations near the former ARCO operations; and

- The second highest surface sediment HPAH concentration for the entire Shipyard Sediment Site was reported for station SW24 (58,000 µg/kg).

Sediment deposition and erosional processes in the vicinity of the Shipyard Sediment Site have not been documented. Very little evidence of maintenance dredging in the northern portion of the NASSCO lease has been reported, although the area between BAE Systems Piers 1 through 4 was dredged in 1984. It is likely that this dredging would have removed some of the petroleum-hydrocarbon impacted sediment deposited prior to 1978, when ARCO ceased operations at the wharf/pier (Haddad, 2005).

8.9. Analyses and Evaluations of Petroleum Hydrocarbons

The List Report, submitted by Chevron, states that “chemical analyses of sediment samples taken at the Shipyard Sediment Site…have shown that the HPAHs found in those sediments cannot be traced to products stored, transferred or distributed by Chevron at its San Diego Terminal.” (List, 2005). Chevron reports that, based on independent and Chevron proprietary product analyses, the HPAHs present in the sediment are not present in the Chevron products at the site. Their report suggests that the HPAHs are of coal tar origin. The BP facility stores and distributes products very similar to those stored and distributed by Chevron.

BP submitted the report “Forensic Geochemical Analysis of TPH and PAH Data Collected from Sediments at BAE Systems, San Diego, CA” (Haddad Report) (Haddad, 2005). The Haddad Report states that the TPH and PAH contamination “could not have come from BP Terminal operations” (Haddad, 2005). The report’s conclusions are based on their analysis of the data provided in the Shipyard Report (Exponent, 2003). TPH carbon range-based quantifications were used the analysis. The analysis also included using PAH “fingerprinting” and the fact that there are two basic types of PAHs: parent PAHs and alkylated PAHs. Comparisons of the PAH “fingerprints” and TPH carbon ranges were used in the Haddad Report to conclude that the hydrocarbons in the shipyard sediment are from pyrogenic sources, not petrogenic sources. PAHs from petrogenic sources would provide evidence of a possible release of PAHs from a bulk storage terminal.

Using the molecular weight technique, TPH can be categorized as GRO, DRO, or residual range organics (RRO). Some petroleum products can fall into more than one category. By graphing the spectrum of molecular weights, a curve of each product or mixture of products, can be generated. GRO was found in inconsiderable amounts in sediment samples with only one detection in over 80 sediment samples. Elevated concentrations of DRO were found in near-shore sediment, while RRO concentrations were found near the northwest corner of the sampling area (at sampling stations SW01 and SW02) and near storm water outfalls. The lack of GRO in samples suggests sources other than the refined products in the Chevron and BP facilities (Haddad, 2005).

The fingerprinting technique separates the PAHs into six homologous PAH families: naphthalenes, fluorenes, dibenzothiophenes, anthracenes/phenanthrenes, fluoranthenes/pyrenes, and chrysenes. Each family is composed of a parent PAH, with no carbon atoms attached to their rings, and the alkylated PAHs with 1 to 4 carbon atoms attached to the parent rings. The amount of each type of PAH found in a sample is then plotted on a graph and grouped according to family. The PAHs can then be grouped according to whether the sample of petroleum product is a petrogenic or pyrogenic sources. Petrogenic sources are derived from petroleum products that have not been exposed to high temperatures such as the petroleum products in storage at the Chevron and BP Terminals. Pyrogenic sources are derived from high temperature processes, and include atmospheric deposition/urban runoff, automobile combustion products, creosote, coal tar, etc. (Haddad, 2005).

The fingerprinting results indicate that the samples collected near the BP and Chevron facilities are composed mainly of pyrogenic sources, thereby excluding the fuels stored at the Chevron and BP Terminals as a possible source of the petroleum hydrocarbons found in bay sediment. One sampling event at sampling station SW24 in August 2002 did show the presence of a petrogenic source, however samples taken before and after this sampling event at the same sampling station did not indicate any petrogenic source product present (Haddad, 2005). BP has not used the pier/wharf near the sampling site since 1978, and therefore, is a highly unlikely source of the PAHs found in the shipyard sediment during this one sampling event.

Creosote impregnated marine pilings have been shown to be a significant source of PAH contamination in San Diego Bay (Chadwick et. al, 1999). At the San Diego Naval Station, the Navy has been mitigating the effects of the creosote pilings by replacing them with plastic ones. There are numerous creosote pilings within the Shipyard Sediment Site. Review of a 1942 aerial photograph show several piers, very likely constructed with creosote pilings, in the vicinity of sampling stations SW20 through SW24, SW27, and SW28 listed in Table 8-2 as having some of the highest reported HPAH concentrations. Many of the old piers at the Shipyard Sediment Site have been removed over the long history of shipyard activities. Pyrogenic PAHs can be released from creosote pilings via leaching or by deterioration from ship and boat contact or during removal.

Based on the information that the San Diego Water Board has reviewed to date, it is likely that most of the PAH contamination present at the Shipyard Sediment Site is of pyrogenic origin and not caused by releases from the ARCO Terminal. Potential sources for the pyrogenic PAHs include vehicle combustion products transported via air deposition and/or storm water runoff, and creosote pilings.

9. Finding 9: San Diego Gas and Electric, A Subsidiary of Sempra Energy Company

Finding 9 of CAO No. ~~R9-2011-0001~~R9-2012-0024 states:

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

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

9.1. Jurisdiction

~~CWC~~ Water Code section 13304 contains the cleanup and abatement authority of the San Diego Water Board. Section 13304(a) provides in relevant part that the San Diego Water Board may issue a cleanup and abatement order to any person "who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirements ... or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance…."

For the reasons set forth below, the San Diego Water Board has determined that SDG&E should be named as a discharger in Cleanup and Abatement Order No. R9-~~2010-0002~~2012-0024 pursuant to ~~CWC~~ Water Code section 13304.

9.2. Admissible Evidence – State Water Resources Control Board Resolution No. 92-49

On June 18, 1992 (amended on April 21, 1994 and October 2, 1996), the State Water Board adopted Resolution No. 92-49, *Policies And Procedures For The Investigation And Cleanup And Abatement Of Discharges Under Water Code Section 13304*. Resolution No. 92-49 provides in part that:

VIII. The San Diego Water Board shall apply the following procedures in determining whether a person shall be required to investigate a discharge under CWC section 13267, or to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC section 13304. The San Diego Water Board shall:

A. Use any relevant evidence, whether direct or circumstantial, including, but not limited to, evidence in the following categories:

1. Documentation of historical or current activities, waste characteristics, chemical use, storage or disposal information, as documented by public records, responses to questionnaires, or other sources of information;

2. Site characteristics and location in relation to other potential sources of a discharge;

3. Hydrologic and hydrogeologic information, such as the difference in upgradient and downgradient water quality;

4. Industry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills, and clarifiers;

5. Evidence of poor management of materials or wastes, such as improper storage practices or inability to reconcile inventories;

6. Lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal;

7. Physical evidence, such as analytical data, soil or pavement staining, distressed vegetation, or unusual odor or appearance;

8. Reports and complaints;

9. Other agencies' records of possible known discharge; and

10. Refusal or failure to respond to San Diego Water Board inquiries.

9.3. Historical Activities

SDG&E owned and operated the Silver Gate Power Plant from 1943 through 1984 (Gonzales, 2005). The plant includes four steam turbine electrical generators. The boilers initially burned fuel oil, and in later years were converted to burn both natural gas and fuel oil (ENV America, 2004a).

SDG&E maintained an easement to San Diego Bay for cooling water discharge lines (CW discharge lines) needed to deliver and remove seawater used for cooling the turbines. This water was non-contact cooling water and the only chemical added to the circulating water was chlorine, which was used to reduce biofouling. Prior to 1978, boiler blowdown (relatively clean water from the steam system that contained settled and precipitated solids) was routed directly to the CW discharge tunnels. Boiler blowdown water may have contained solids and low-level metals. After 1978, the blowdown water was tested for iron and copper and then either treated and discharged to the bay, or directly discharged to the Bay. Additionally, basement bilge water (liquids that accumulated in trenches in the plant basement from the turbine side of the plant) was piped into the CW discharge tunnels. Potential releases in the bilge water may have included oil and grease from equipment lubrication, total suspended solids from water system drains, and possible service system water leaks or spills that contained chromium VI. The location of the easement for the CW discharge tunnels was between the SDMC (now the location of BAE Systems) leasehold and the Kelco leasehold. (ENV America, 2004b; SDUPD, 2004).

Historical photographs indicate that there were two wastewater settling/evaporation ponds and two sub grade oil/water separators on the SDG&E easement. SDG&E reported that basement bilge water from the boiler side of the plant was pumped to a pond for settling and evaporation, and that some of the water from the pond was discharged to the Bay. Historical photographs also indicate that a surface spill at Pond A occurred in 1952 when a plug in piping led to overflow of liquid onto the adjacent ground. Pond B was used from 1966 to 1973 as an oil-water settling pond (ENV America, 2004a, b).

SDG&E reported that the facility had transformers onsite. The transformers were contained within concrete sumps as part of the spill prevention and control plan measures for secondary containment for oil storage units (ENV America, 2004b).

Silver Gate Power Plant was taken off-line by 1984 and was maintained in mothball status until several years ago. SDG&E planned to begin disassembly and removal of the boilers and turbine generating units in late 2004. The ponds were filled in at some unknown time in the past (ENV America, 2004b; SDUPD, 2004).

9.4. Site Characteristics, Hydrology and Hydrogeology

Based on a review of the United States Geological Survey (USGS), Point Loma, California 7.5-minute quadrangle map (1994), the Silver Gate Power Plant facility is currently situated within the low-lying area developed near San Diego Bay. Elevations at the site range from approximately 10 to 30 feet above mean sea level. Based on topographic conditions, surface drainage is generally to the west and southwest toward Chollas Creek and San Diego Bay. Based on the proximity to San Diego Bay and Chollas Creek, the depth to groundwater in the study area is estimated at between 10 and 20 feet below ground surface (SDUPD, 2004).

9.5. SDG&E's Discharges Have Created Pollution, Contamination, and Nuisance Conditions in San Diego Bay

Based on the information regarding the historical activities provided in Sections 9.3, 9.7, 9.8, 9.9 and 9.10 the San Diego Water Board has determined that SDG&E is responsible for discharging pollutants including metals (chromium, copper, lead, nickel, and zinc), PCBs, PAHs, TPH-d, and TPH-h to San Diego Bay at the Shipyard Sediment Site as a result of their operations at the Silver Gate Power Plant. As described below in Sections 9.8, 9.9 and 9.10, and Tables 9-4, 9-5, 9-6, 9-7 and 9-8, the same pollutants in the SDG&E discharges have accumulated in San Diego

Bay sediment in the vicinity of the MS4 Storm Drain SW4 within the BAE Systems facility portion of the Shipyard Sediment Site in concentrations that adversely affect the beneficial uses of San Diego Bay. See Section 4 of this Technical Report for more details on MS4 Storm Drain SW4[65].

PCBs are a family of organic compounds that are produced by substituting chlorine atoms for hydrogen atoms on a biphenyl molecule. Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCBs were commonly used in onsite industrial applications including electrical, heat transfer, and hydraulic equipment. From 1929 to 1977 700,000 tons of PCBs were produced in the United States and an estimated 141,000 tons of pure PCBs remained in service at the end of 1988 (EPA, 2006). The majority of PCBs were used in the production of dielectric fluids for transformers, capacitors, and other electrical components. Concern over the toxicity and persistence in the environment of PCBs led Congress in 1976 to enact section 6(e) of the Toxic Substances Control Act (TSCA) that included, among other things, prohibitions on the manufacture, processing, and distribution in commerce of PCBs.

The evidence of PCB discharges is of particular concern as PCB sediment concentration levels in the vicinity of the MS4 Storm Drain SW4 are among the highest in the Shipyard Sediment Site. The discharge of PCBs from the MS4 Storm Drain SW4 and from the wastewater ponds to San Diego Bay can cause a condition of pollution, contamination, and nuisance in San Diego Bay through the following pathways:

PCB Bioaccumulation. PCBs tend to be sorbed to bay bottom marine sediment and are transported and deposited with bay sediment. Bay sediment re-suspension can reintroduce PCBs into the aquatic environment and extend their environmental impacts. Fish and other aquatic organisms are exposed to PCBs through direct intake of contaminated water and sediment, or through consumption of contaminated food. PCBs have the potential to bioaccumulate in organisms and biomagnify through the food chain.

Human Health Threat. The accumulation of PCBs in the sediment is a threat to human health primarily through the consumption of fish and shellfish contaminated by PCBs in the sediment through the processes of bioaccumulation and biomagnification. Other potential pathways of exposure include direct contact with contaminated sediment by swimmers or divers and incidental ingestion of contaminated sediment or associated water by swimmers or divers.

As described in Sections 14 through 28 of this Technical Report these same pollutants have accumulated in San Diego Bay sediment at levels that may:

11. Adversely affect the beneficial uses of San Diego Bay, as described in later sections of this Technical Report;

12. Cause pollution, contamination, or nuisance conditions in San Diego Bay; and

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[65] SDG&E asserts that its contribution of pollutants could not, alone, have caused a condition of pollution or nuisance and therefore liability may not be imposed under Water Code section 13304. For the reasons discussed in the San Diego Water Board Cleanup Team's Response to Comments Report (Aug. 23, 2011), pp. 9-1 through 9-12, SDG&E's argument is one of allocation of responsibility rather than liability.

13. Degrade marine communities, cause adverse effects on the environment or the public health, or result in harmful concentrations of pollutants in marine sediment.

Accordingly, it is concluded that SDG&E has caused or permitted the discharge of waste to San Diego Bay in a manner contributing to the creation of pollution or nuisance conditions at the Shipyard Sediment Site. It is therefore appropriate for the San Diego Water Board to ~~issue a cleanup and abatement order naming~~ name SDG&E as a discharger in this CAO pursuant to ~~CWC~~ Water Code section 13304.

9.6. NPDES Requirement Regulation

Waste discharges from the SDG&E facility have historically been regulated under NPDES requirements prescribed by the San Diego Water Board pursuant to CWA section 402 and ~~CWC~~ Water Code section 13376. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the CWA and ~~CWC~~ Water Code is grounds for enforcement action, including but not limited to, the issuance of a Cleanup and Abatement Order under CWC section 13304.

SDG&E discharged plant process water to San Diego Bay from the SDG&E facility to the Shipyard Sediment Site subject to the terms and conditions of NPDES permits for plant process waters and storm water, respectively. A listing of the plant process water NPDES requirements adopted by the San Diego Water Board is provided below.

Table 9-1 SDG&E's Plant Process Water NPDES Permits

Order Number / NPDES No.	Order Title	Adoption Date	Expiration Date
Order No. 76-9, NPDES No. CA0001376	Waste Discharge Requirements For San Diego Gas And Electric Company Silver Gate Power Plant San Diego County	May 10, 1976	January 28, 1985
Order No. 85-07, NPDES No. CA0001376	Waste Discharge Requirements For San Diego Gas & Electric Company Silver Gate Power Plant San Diego County	January 28, 1985	April 13, 1995

In 1992, SDG&E's Silver Gate Power Plant obtained coverage under the State Water Board's 1991 General Industrial NPDES Requirements for storm water discharges. These NPDES requirements supplemented SDG&E's NPDES requirements listed in Table 9-1. The industrial storm water NPDES requirements applied specifically to discharges of pollutants through storm water, while the NPDES permits listed in Table 9-1 applied to plant process water. The General Industrial NPDES Requirements for storm water discharges adopted by the State Water Board in effect at the time the facility was operated by SDG&E is provided in Table 9-2 below.

Table 9-2 SDG&E General Industrial Storm Water NPDES Requirements

Order Number / NPDES No.	Order Title	Adoption Date	Expiration Date
91-13-DWQ, Industrial NPDES No. CAS000001	Waste Discharge Requirements (WDRs) For Discharge Of Storm Water Associated With Industrial Activities Excluding Construction Activities	November 19, 1991 (Notice of Intent Filed April 7, 1992)	April 17, 1997 (Notice of Intent Filed September 12, 1997)

The General Industrial Storm Water Permit required SDG&E to develop and implement plans to limit its discharges of pollutants from storm water runoff into San Diego Bay. Rather than relying on specific numerical effluent limitations, the General Permit directed SDG&E to create and follow "Best Management Practices"[66] (BMPs). The General Industrial Storm Water NPDES Requirements also required SDG&E to develop and implement a Storm Water Pollution Prevention Plan (SWPPP) and a storm water Monitoring and Reporting Program Plan (MRPP).

9.6.2. Order No. 76-9, NPDES Permit No. CA0001376

Order No. 76-9, NPDES Permit No. CA0001376, in effect from May 10, 1976 to January 28, 1985, contained the following narrative limitations that relate to the discussions contained herein:

- A. EFFLUENT LIMITATIONS … 1.D. The discharge of polychlorinated biphenyls is prohibited.
- A. EFFLUENT LIMITATIONS…1.F. The discharge of chemicals or other wastes not described in the findings of this Order and the discharger's Report of Waste Discharge is prohibited.
- C. PROVISIONS…5. Neither the treatment nor the discharge of pollutants shall create a pollution, contamination or nuisance as defined by the CWC.
- B. PROVISIONS … 8. This order includes Items 1, 2, 4, 5, 6, 7, 8, 9, 10 and 11 of the attached "Standard Provisions."

  Standard Provisions … 1. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the discharger from his liabilities under federal, state, or local laws, nor guarantee the discharger a capacity right in the receiving waters. … 2. The discharge of any radiological, chemical, or biological warfare agent or high level radiological waste is

66 Best management practices ("BMPs") means schedules of activities, prohibitions of maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

prohibited. … 4. The discharger shall permit the San Diego Water Board: (a) Entry upon premises in which an effluent source is located or in which any required records are kept; (b) access to copy any records required to be kept under terms and conditions of this order; (c) inspections of monitoring equipment or records, and (d) sampling of any discharge. … 5. All discharges authorized by this order shall be consistent with the terms and conditions of this order. The discharge of any pollutant more frequently than or at a level in excess of that identified and authorized by this order shall constitute a violation of the terms and conditions of this order. … 6. The discharger shall maintain in good working order and operate as efficiently as possible any facility or control system installed by the discharger to achieve compliance with the waste discharge requirements. … 7. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of at a legal point of disposal, and in accordance with the provisions of Division 7.5 of the CWC. For that purpose of this requirement, a legal point of disposal is defined as one for which waste discharge requirements have been prescribed by a Regional Water Board and which is in full compliance therewith. … 8. After notice and opportunity for a hearing, this order may be terminated or modified for cause, including, but not limited to: (a) violation of any term or condition contained in this order; (b) obtaining this order by misrepresentation, or failure to disclose fully all relevant facts; (c) a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge. … 9. If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under section 307(a) of the Federal Water Pollution Control Act, or amendments thereto, for a toxic pollutant which is present in the discharge authorized herein and such standard or prohibition is more stringent than any limitation upon such pollutant in this order, the Board will revise or modify this order in accordance with such toxic effluent standard or prohibition and so notify the discharger. … 10. There shall be no discharge of harmful quantities of oil or hazardous substances, as specified by regulation adopted pursuant to section 311 of the Federal Water Pollution Control Act, or amendments thereto. … 11. In the event the discharger is unable to comply with any of the conditions of this order due to: (a) breakdown of waste treatment equipment; (b) accidents caused by human error or negligence; or (c) other causes such as acts of nature. The discharger shall notify the Executive Officer by telephone as soon as he or his agents have knowledge of the incident and confirm this notification in writing within two weeks of the telephone notification. The written notification shall include pertinent information explaining reasons for the noncompliance and shall indicate what steps were taken to correct the problem and the dates thereof, and what steps are being taken to prevent the problem from recurring.

9.6.3. Order No. 85-07, NPDES Permit No. CA0001376

Order No. 85-07, NPDES Permit No. CA0001376, in effect from January 28, 1985 to April 13, 1995, contained the following narrative limitations that relate to the discussions contained herein:

- A. PROHIBITIONS … 2. The discharge of polychlorinated biphenyl compounds, such as those commonly used for transformer fluid, is prohibited.

- B. DISCHARGE SPECIFICATIONS … 2. The Silver Gate Power Plant discharge to San Diego Bay shall be essentially free of: (b) Settleable material or substances that form sediments which degrade benthic communities or other aquatic life; (c) Substances toxic to marine life due to increases in concentrations in marine waters or sediments.

- D. RECEIVING WATER LIMITATIONS. The Silver Gate Power Plant discharge to San Diego Bay shall not by itself or jointly with any discharge or discharges cause the following water quality objective to be violated: … 1. Physical Characteristics … (d) Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses. … 5 Toxicity … (a) All waters shall be maintained free of toxic substances in concentrations that are toxic to or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

- E. PROVISIONS … 1. Neither the treatment nor the discharge of pollutants shall create a pollution, contamination, or nuisance as defined by Section 13050 of the CWC.

9.6.4. Order No. 91-13-DWQ, NPDES Permit No. CAS000001, General Industrial NPDES Requirements for Storm Water Discharges

Order No. 91-13-DWQ, NPDES Permit No. CAS000001, in effect from April 7, 1992 to September 12, 1997, contained the following key narrative limitations that relate to the discussions contained in herein:

- A. DISCHARGE PROHIBITIONS: … 3. Storm water discharges shall not cause or threaten to cause pollution, contamination, or nuisance; and

- B. RECEIVING WATER LIMITATIONS. … 1. Storm water discharges to any surface or ground water shall not adversely impact human health or the environment.

9.7. SDG&E's Process Water Monitoring for Plant Process Water NPDES Requirements

SDG&E discharged plant process water to the Shipyard Sediment Site subject to the terms and conditions of two NPDES Permits beginning in 1976 and ending in 1995 when the plant was decommissioned.

Between 1985 and 1995, Order No. 85-07, NPDES Permit No. CA0001376 established monitoring requirements, numerical waste discharge limitations, and narrative waste discharge limitations. The narrative waste discharge limits were in the form of a Discharge Specification which set a narrative limit on discharge pollutant concentrations with intent to reduce or eliminate toxic chemical concentrations in marine water, marine life, and sediment.

During the permit cycle, SDG&E stayed within the permit specified numerical limitations for copper, nickel, and zinc, but the San Diego Water Board also required that the discharge from SDG&E not cause a violation of the Discharge Specifications presented in Section 9.6.3 above. During that time, SDG&E violated narrative waste discharge limitations by discharging constituents at levels that were elevated compared to levels established by the CTR for saltwater.[67]

U.S. EPA finalized the CTR on May 18, 2000. None of the numerical values in CTR were included in any of the NPDES Permits issued to SDG&E. However, the numerical values in CTR represent the latest, most up-to-date numerical thresholds for use in determining whether a chemical concentration in water is detrimental to its beneficial uses. By comparing CTR values with historical discharges, the San Diego Water Board is able to determine which discharges *may* have contributed to toxic chemical concentrations in marine water, marine life, and sediment at the shipyard sediment site in the past. Also, where there are historical discharges elevated above CTR values, there exists an *elevated probability* that those same discharges contributed to the present condition of pollution. To the extent that those historical, elevated discharges *did* cause toxic chemical concentrations in marine water, marine life, and sediment, and/or *did* contribute to the present condition of pollution at the shipyard sediment site, there exists an NPDES violation.

To the extent that SDG&E's discharge was elevated above these values and caused violations of the above Discharge Specifications by causing toxic chemical concentrations in marine water, marine life, and sediment, and/or contributed to the present condition of pollution at the shipyard sediment site, the following specific discharges are violations of narrative limits of Order No. 85-07, NPDES Permit No. CA0001376. Monitoring data provided by SDG&E during the years 1990 through 1994, indicate that elevated levels of copper, nickel, and zinc were present in the water discharged from the site when compared to levels established by the CTR for saltwater. Specific discharges are cited below in Table 9-3.

Table 9-3 Discharges above CTR Values Occurring from 1990 to 1994

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Source	Citation[3]
January-June 1990	Copper	0.025 mg/L	0.0031 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1

[67] The California Toxics Rule (CTR) was finalized by the U.S. EPA in the Federal Register (65 Fed. Register 31682-31719), adding Section 131.38 to Title 40 of the Code of Federal Regulations on May 18, 2000. The full text of the CTR is available at the following web address: http://www.epa.gov/OST/standards/ctrindex.html.

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Source	Citation[3]
January-June 1990	Nickel	0.089 mg/L	0.0082 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
January-June 1990	Zinc	0.081 mg/L	0.081 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
July-December 1990	Copper	0.019 mg/L	0.0031 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
January-June 1991	Copper	0.01 mg/L	0.0031 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
January-June 1991	Zinc	0.16 mg/L	0.081 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
July-December 1991	Copper	0.012 mg/L	0.0031 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
July-December 1991	Zinc	0.19 mg/L	0.081 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
January-June 1992	Zinc	0.094 mg/L	0.081 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
July-December 1992	Copper	0.031 mg/L	0.0031 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Source	Citation[3]
July-December 1992	Zinc	0.16 mg/L	0.081 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
January-June 1993	Copper	0.025 mg/L	0.0031 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
January-June 1993	Zinc	0.13 mg/L	0.081 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
January-June 1994	Copper	0.018 mg/L	0.0031 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1
January-June 1994	Zinc	0.12 mg/L	0.081 mg/L	Section 9.5	SDG&E Monitoring Report	Order No. 85-07, B. Discharge Specifications 2b and 2c, D. Receiving Water Limitations 1d and 5a, and E. Provisions 1

1. 40 CFR 131.38
2. Reference to Section 9.5 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 9.5.
3. The cited waste discharge requirement(s) can be found in Section 9.6 of this Technical Report.

9.8. Unauthorized Discharge of Toxic Pollutants to Land

In 2006, SDG&E closed in place three 220,000 gallon concrete underground storage tanks (USTs) (TN & Associates, 2006). Prior to excavating the overburden above the tanks, eighteen surface soil samples were collected from depths less than 0.5 feet below ground surface. Ten of these samples were collected from locations observed to have oil-like staining (SS1 through SS10) and the remaining eight were randomly selected from locations with no visible staining (SS11 through SS18). These 18 samples were collected over an area approximately 440 feet long by 80 feet wide, approximately 900 feet from San Diego Bay. The UST area is bounded by an alley on the south and Sampson Street on the east.

Samples SS1 through SS10 were analyzed for TPH, PCBs, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. Samples SS11 through SS 18 were analyzed for TPH, PCBs, and metals. The results for PCBs, copper, lead, zinc, and TPH are presented in Table 9-4. Elevated concentrations of chromium and nickel were also reported in the surface soil samples.

All 18 of the samples, including those collected from locations with no visible staining, were reported to contain PCBs (TN & Associates, 2006). Eleven of the 18 samples had PCB concentrations greater than 1,000 µg/kg. The samples with the highest concentrations (SS12, SS17, and SS18) had PCB concentrations of 125,000 µg/kg, 14,700 µg/kg, and 34,700 µg/kg, respectively.

Storm water run-off from the SDG&E property is generally directed to the nearest storm drain which discharges to San Diego Bay through a 30-inch pipe that runs along Sampson Street (ENV America, 2004b). Aroclor 1260 was the only PCB reported in the 18 surface soil samples collected in the UST overburden (TN & Associates, 2006). Aroclor 1260 was also the highest PCB concentrations reported in the sediment samples collected from the MS4 catch basin on Sampson Street in the immediate vicinity of the UST area. See Section 9.9 below on the investigation of illegal discharges to the MS4. In addition, Aroclor 1260 was the highest PCB concentration reported in the Shipyard Sediment Site samples SW20 through SW25 collected in San Diego Bay the vicinity of the MS4 outfall (see Table 9-6).

The PCBs, metals, and TPH pollutants reported in the surface soils were discharged or deposited over a large area where they were, or would probably be, discharged into San Diego Bay via storm water runoff creating, or threatening to create, a condition of pollution or nuisance.

Table 9-4 SDG&E Underground Storage Tank Closure - Selected Surface Soil Sampling Results

Soil Sample No.	PCBs (Aroclor 1260) µg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg	TPH as Diesel (C13 - C22) mg/kg	TPH as Heavy HC (C23 - C40) mg/kg	TPH as Diesel and Heavy HC (C13 - C40) mg/kg
SS1	890	1,300	2,960	3540	99,400	5,510	105,000
SS2	1,140	3,400	3,740	8380	132,000	17,400	149,000
SS3	3,020	3,830	1,240	1,640	50,500	14,300	64,800
SS4	1,050	1,240	580	3,730	89,700	12,200	102,000
SS5	428	2,740	2,550	3,760	64,900	2,890	67,800
SS6	862	2,820	3,360	4,190	78,900	3,910	82,800
SS7	2,470	2,350	3,700	2,600	145,000	10,300	155,000
SS8	1,160	1,890	4,240	4,690	124,000	5,700	130,000
SS9	1,140	5,180	1,780	5,350	77,600	4,620	82,200

Soil Sample No.	PCBs (Aroclor 1260) µg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg	TPH as Diesel (C13 - C22) mg/kg	TPH as Heavy HC (C23 - C40) mg/kg	TPH as Diesel and Heavy HC (C13 - C40) mg/kg
SS10	3,270	358	905	786	42,600	20,300	62,900
SS11	80.8	1,510	570	5,930	98	110	208
SS12	125,000	178	57	1,080	200	348	548
SS13	70.0 J	84	35	2,530	ND <5.0	ND <5.0	ND <5.0
SS14	1,720	5,370	923	8,700	114	364	478
SS15	98.9	81	27	237	49	57	106
SS16	56.2 J	83	13	1,290	233	96	329
SS17	14,700	217	69	1,090	1	1	1
SS18	3,4700	1,220	710	7,920	1	1	1

1. No analytical results reported
(TN & Associates, 2006)

9.9. Unauthorized Discharge of Toxic Pollutants into the MS4

The City of San Diego reported that on October 3, 2005, they conducted an investigation and observed evidence of an illegal discharge into the MS4 catch basin on the north side of Sampson Street between Belt Street and Harbor Drive, approximately 10 feet east of the railroad line that runs parallel with Belt Street. Specifically, the catch basin is located immediately to the east of the BAE Systems’ parking lot and the SDG&E Silver Gate Power Plant, which is adjacent to the parking lot. During the City’s investigation, three sediment samples were collected and analyzed for PCBs and PAHs. The first sample was collected from inside and at the base of a six-inch lateral entering the catch basin from the former Silver Gate Power Plant leasehold. The second sample was collected from inside and at the base of the 12-inch lateral entering the catch basin from another area draining storm water from the facility. The third sample was collected from the 18-inch pipe exiting the catch basin and conveying urban runoff to San Diego Bay at the Shipyard Sediment Site. The results of these three samples, presented in Table 9-5 below, indicate the presence of both PCBs and PAHs entering the municipal storm water system from SDG&E’s former Silver Gate Power Plant leasehold and exiting the municipal storm drain system catch basin to San Diego Bay. The City of San Diego issued a Notice of Violation (NOV) to SDG&E (Zirkle, 2005a; Kolb, 2005b).

Table 9-5 City of San Diego MS4 Sediment Sample Results for PCBs and PAHs on October 3, 2005

Constituent	Effects Range-Low (ERL)[1] µg/kg	Effects Range-Median (ERM)[1] µg/kg	6" Lateral µg/kg	12" Lateral µg/kg	Catch Basin µg/kg
Aroclor-1016			< 50	< 50	< 50
Aroclor-1221			< 50	< 50	< 50
Aroclor-1232			< 50	< 50	< 50
Aroclor-1242			< 50	< 50	< 50
Aroclor-1248			< 50	< 50	< 50
Aroclor-1254			650	130	260
Aroclor-1260			720	120	360
Aroclor-1262			< 50	< 50	< 50
Sum of Aroclors®	22.7[2]	180[2]	**1,370**	**250**	**620**
Naphthalene[3]	160	2,100	70	330	170
Acenaphthylene[3]	44	640	< 50	< 50	< 50
Acenaphthene[3]	16	500	< 50	< 50	< 50
Fluorene[3]	19	540	< 50	< 50	< 50
Phenanthrene[3]	240	1,500	210	140	< 50
Anthracene[3]	85.3	1,100	< 50	< 50	< 50
Fluoranthene[4]	600	5,100	< 50	< 50	3,300
Pyrene[4]	665	2,600	500	170	91
Benzo [a] Anthracene[4]	261	1,600	450	< 50	< 50
Chrysene[4]	384	2,800	210	65	< 50
Benzo [b] Fluoranthene[4]	NA	NA	260	67	< 50
Benzo [k] Fluoranthene[4]	NA	NA	160	110	< 50
Benzo [a] Pyrene[4]	430	1,600	130	59	< 50
Dibenz [a,h] Anthracene[4]	63.4	260	< 50	< 50	< 50

Constituent	Effects Range-Low (ERL)[1] µg/kg	Effects Range-Median (ERM)[1] µg/kg	6" Lateral µg/kg	12" Lateral µg/kg	Catch Basin µg/kg
Benzo [g,h,i] Perylene[4]	NA	NA	< 50	< 50	< 50
Indeno [1,2,3-c,d] Pyrene[4]	NA	NA	93	< 50	< 50
Total PAHs	4,022	44,792	**2,083**	**941**	**3,391**

1. Long et al., 1995
2. ERL and ERM levels are for Total PCBs
3. LPAH – low molecular weight polynuclear aromatic hydrocarbon
4. HPAH – high molecular weight polynuclear aromatic hydrocarbon

Non-detections are represented as less than the reporting limit.
(CEL, 2005)

The municipal storm drain system discharges into the BAE Systems leasehold at the Shipyard Sediment Site between Piers 3 and 4. This outfall is indicated as MS4 Storm Drain SW4 in Section 4 of this Technical Report. Sediment sample stations in San Diego Bay from the Detailed Sediment Investigation (Exponent, 2003) in the area of this outfall include SW20 through SW25. The Bay sediment sample results for PCBs and PAHs are presented in Table 9-6.

Table 9-6 NASSCO and BAE Systems Detailed Sediment Investigation PCB and PAH Results for SW20 through SW25

Constituent	SW20 µg/kg	SW21 µg/kg	SW22 µg/kg	SW23 µg/kg	SW24 µg/kg	SW25 µg/kg
Aroclor-1016	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1221	< 500	< 520	< 57	< 58	< 460	< 51
Aroclor-1232	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1242	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1248	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1254	1,500	1,600	670	550	790	330
Aroclor-1260	1,600	1,800	790	710	870	380
Sum of Aroclors®	**3,100**	**3,400**	**1,500**	**1,300**	**1,700**	**710**
Naphthalene[1]	< 13	13	31	< 15	26	< 13
Acenaphthylene[1]	120	130	150	130	290	180
Acenaphthene[1]	16	14	17	19	14	13
Fluorene[1]	53	53	56	53	220	45
Phenanthrene[1]	300	220	330	360	810	260
Anthracene[1]	450	370	500	500	6,000	440
Fluoranthene[2]	930	580	910	960	7,100	750
Pyrene[2]	1,200	850	1,100	1,000	3,100	940
Benzo [a] Anthracene[2]	760	650	890	850	6,300	710
Chrysene[2]	1,800	1,400	1,900	1,800	11,000	1,300
Benzo [b] Fluoranthene[2]	1,500	1,600	1,800	1,500	7,000	2,000
Benzo [k] Fluoranthene[2]	1,200	1,100	1,300	1,200	7,300	1,600
Benzo [a] Pyrene[2]	1,400	1,500	1,700	1,500	8,800	2,000
Dibenz [a,h] Anthracene[2]	200	210	230	220	1,100	240
Benzo [g,h,i] Perylene[2]	770	780	830	820	2,800	800
Indeno [1,2,3-c,d] Pyrene[2]	970	990	1,100	1,000	3,700	1,100

Constituent	SW20 µg/kg	SW21 µg/kg	SW22 µg/kg	SW23 µg/kg	SW24 µg/kg	SW25 µg/kg
Total PAHs	**11,669**	**10,460**	**12,844**	**11,912**	**65,560**	**12,378**

1. LPAH – low molecular weight polynuclear aromatic hydrocarbon
2. HPAH – high molecular weight polynuclear aromatic hydrocarbon

Non-detections are represented as less than the quantitation limit.
(Exponent, 2003)

PCBs in sediment from the laterals and catch basin of the MS4 conveyance were found at levels that exceed the ERL and ERM of 22.7 µg/kg and 180 µg/kg, respectively (Long et al., 1995), as well as the proposed Alternative Sediment Cleanup Levels.

Sediment PCB levels, specifically Aroclor-1254 and 1260, and sediment PAH levels reported in the MS4 conveyance are also reported in the bay sediment near the storm water outfall as indicated by comparing Tables 9-5 and 9-6. This data provides evidence that discharges from the SDG&E facility have contributed to the pollution in the Shipyard Sediment Site.

9.10. Characterization of Wastewater Pond Operations and Discharge to San Diego Bay

Soil boring samples taken at the locations of the former wastewater ponds found residual metals, PAH, and PCB contamination. The proximity of the ponds to San Diego Bay and evidence that a discharge happened on at least one occasion provide a potential for discharges that contributed pollution to the Shipyard Sediment Site.

SDG&E Landside Tidelands Lease Area Site Assessment Report describes an investigation that characterized the potential residual contamination that may be present at the location of two former wastewater pond operations (ENV America, 2004a). These ponds reportedly were used to settle solids and separate oil and grease from bilge water collected from the boiler side of the plant before being discharged to the Bay (ENV America, 2004b).

The investigation included the collection and analysis of seven soil borings and ground water samples. Each boring produced three samples (approximate depth of fill material, pond sediment, and soil underlying the pond sediment) and a groundwater sample. The samples were analyzed for one or more of the following TPHs within the gasoline, diesel, and heavy hydrocarbon ranges (TPH-g, TPH-d, and TPH-h), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals (ENV America, 2004a).

In SDG&E's July 14, 2004, response to the 13267 investigative order, it is clearly stated that "[s]ome water from the pond was discharged to the Bay" (ENV America, 2004b). However, it is not clear whether both ponds discharged or whether only one of the two ponds discharged to the Bay. In any case, discharge to the Bay from either pond is reason for concern based on the investigation results.

Pond A soil contained low concentrations of organic compounds, including TPH-d and TPH-h, and SVOCs. However, none of the soil samples from Pond A was reported to contain detectable VOCs, PCBs, or appreciable metals.

Soil data from Pond B showed the presence of organic and metal analytes. The occurrence of shallow soil contaminants was generally coincident with what was visually identified to be the base of the former ponds. Hydrocarbon soil concentrations typically decreased rapidly with depth, suggesting limited vertical migration. Chromium and benzo [a] anthracene were detected in one sample from Pond B soil at concentrations above U.S. EPA industrial Preliminary Remediation Goals (PRGs) (ENV America, 2004a).

A comparison of Pond B soil boring results with sediment clean-up levels identifies several constituents at levels that would be of concern, especially if any of this waste stream was discharged to San Diego Bay. Additionally, the presence of residual contamination and the proximity of the pond to San Diego Bay indicate a potential for discharges from the pond to contribute pollution at the Shipyard Sediment Site via storm water runoff or airborne transport during both operation and post operation until the ponds were filled in and covered at some unknown date. The following tables present the data that exceed the effects range low (ERLs) and effects range median (ERMs).

Table 9-7 Comparison of Pond B Soil Boring Sample Results for PCBs and Metals

Constituent	Units	Effects Range-Low (ERL)[1]	Effects Range-Median (ERM)[1]	Soil Boring Sample Results	
				B2-2.0[3]	**B4-3.0[3]**
Total PCBs[2]	µg/kg	22.7	180	**380**	**4,400**
Chromium	mg/kg	81	370	**4,220**	**131**
Copper	mg/kg	34	270	**393**	**868**
Lead	mg/kg	46.7	218	**277**	**520**
Nickel	mg/kg	20.9	51.6	**125**	**33.8**
Zinc	mg/kg	150	410	**1,190**	**1,060**

1. Long et al., 1995
2. Sum of Aroclors®, includes detected results for Aroclor-1254 and Aroclor-1260
3. The first unit of the sample identification indicates the borehole number (e.g., B2) and the second unit indicates the sample depth (e.g., 2.0 feet below ground surface [bgs])

Table 9-8 Comparison of Pond B Soil Boring Sample Results for Benzo[a]pyrene

Constituent	Units	Effects	Effects	Soil Boring Sample Results

		Range-Low (ERL)[1]	Range-Median (ERM)[1]	**B2-2.0[2]**	**B5-2.0[2]**	**B6-2.0[2]**
Benzo[a]pyrene	µg/kg	430	1,600	2,800	1,020	3,130

1. Long et al., 1995
2. The first unit of the sample identification indicates the borehole number (B2) and the second unit indicates the sample depth (e.g., 2.0 feet below ground surface [bgs])

Groundwater results indicated low hydrocarbon concentrations detected in both Pond A and B areas. Volatile compounds including chlorinated solvents were detected in groundwater (ENV America, 2004a).

10. Finding 10: United States Navy

Finding 9 of CAO No. ~~R9-2011-0001~~R9-2012-0024 states:

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

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

Also, from 1921 to the present, the U.S. Navy has provided shore support and pier-side berthing services to U.S. Pacific fleet vessels at NBSD located at 3445 Surface Navy Boulevard in the City of San Diego. NBSD currently occupies 1,029 acres of land and 326 water acres adjacent to San Diego Bay to the west, and Chollas Creek to the north near Pier 1. Between 1938 and 1956, the NBSD leasehold included a parcel of land within the Shipyard Sediment Site referred to as the 28th Street Shore Boat Landing Station, located at the south end of the present day NASSCO leasehold at the foot of 28th Street and including the 28th Street Pier. The San Diego Water Board ~~alleges, but the U.S. Navy denies,~~ finds that the U.S. Navy caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance at this location when it conducted operations similar in scope to a small boatyard, including solvent cleaning and degreasing of vessel parts and surfaces, abrasive blasting and scraping for paint removal and surface preparations, metal plating, and surface finishing and painting. Prevailing industry-wide boatyard operational practices employed during the 1930s through the 1980s were often not sufficient to adequately control or prevent pollutant discharges, and often led to excessive discharges of pollutants and accumulation of pollutants in marine sediment in San Diego Bay. The types of pollutants found in elevated concentrations at the Shipyard Sediment Site (metals, butyltin species, PCBs, PCTs, PAHs, and TPH) are associated with the characteristics of the waste the U.S. Navy operations generated at the 28th Street Shore Boat Landing Station site. Based on the preceding considerations, the U.S. Navy is referred to as "Discharger(s)" in this CAO.

10.1. Jurisdiction

~~CWC~~ Water Code section 13304 contains the cleanup and abatement authority of the San Diego Water Board. Section 13304(a) provides in relevant part that the San Diego Water Board may issue a cleanup and abatement order to any person "who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirements … or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance…."

For the reasons set forth below, the San Diego Water Board has determined that the U.S. Navy should be named as a discharger in Cleanup and Abatement Order No. R9-~~2010-0002~~2012-0024 pursuant to ~~CWC~~ Water Code section 13304.

10.2. Admissible Evidence – State Water Resources Control Board Resolution No. 92-49

On June 18, 1992 (amended on April 21, 1994 and October 2, 1996), the State Water Board adopted Resolution No. 92-49, *Policies And Procedures For The Investigation And Cleanup And Abatement Of Discharges Under Water Code Section 13304*. Resolution No. 92-49 provides in part that:

IX. The San Diego Water Board shall apply the following procedures in determining whether a person shall be required to investigate a discharge under CWC section 13267, or to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC section 13304. The San Diego Water Board shall:

A. Use any relevant evidence, whether direct or circumstantial, including, but not limited to, evidence in the following categories:

1. Documentation of historical or current activities, waste characteristics, chemical use, storage or disposal information, as documented by public records, responses to questionnaires, or other sources of information;

2. Site characteristics and location in relation to other potential sources of a discharge;

3. Hydrologic and hydrogeologic information, such as the difference in upgradient and downgradient water quality;

4. Industry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills, and clarifiers;

5. Evidence of poor management of materials or wastes, such as improper storage practices or inability to reconcile inventories;

6. Lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal;

7. Physical evidence, such as analytical data, soil or pavement staining, distressed vegetation, or unusual odor or appearance;

8. Reports and complaints;

9. Other agencies' records of possible known discharge; and

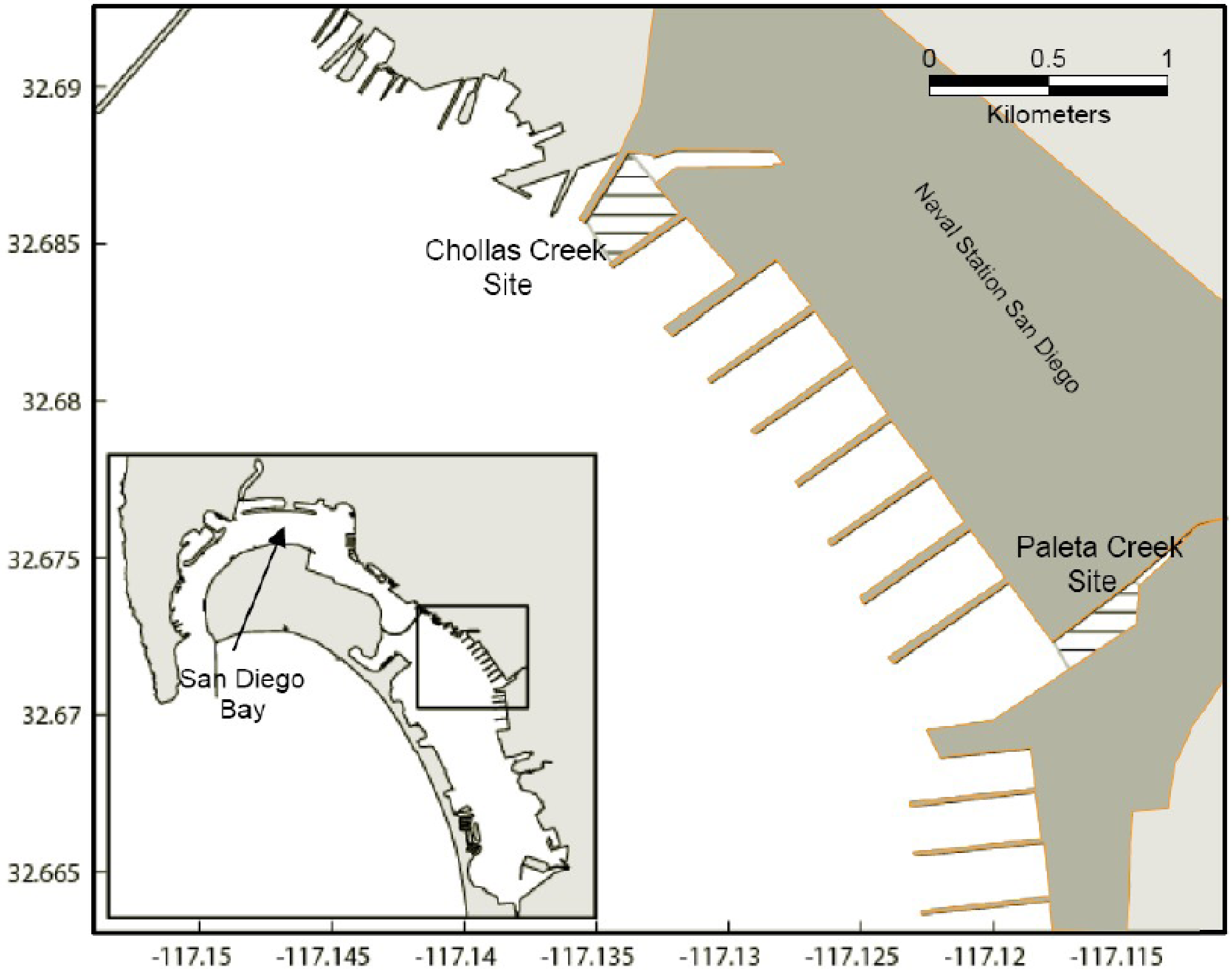
10. Refusal or failure to respond to San Diego Water Board inquiries.

10.3. Naval Station San Diego

From 1921 to the present the U.S. Navy has owned and operated the NBSD. NBSD provides supply and maintenance logistical support to numerous U.S. Navy vessels and is located at 32nd Street and Harbor Drive approximately 3 miles southeast of downtown San Diego on the eastern edge of San Diego Bay. It is bordered by the City of San Diego to the north and east and National City to the south and east and San Diego Bay to the west. NBSD is immediately south of, and adjacent to, the Shipyard Sediment Site, with Chollas Creek separating the two. NBSD's present day leasehold also includes a 24,653 square foot parcel north of Chollas Creek. This parcel is located at the south end of 28th Street in the City of San Diego and is immediately adjacent to Chollas Creek.

The following subsections present both historical and current information on NBSD operations, waste materials, and pollutant transport pathways.

Figure 10-1 Naval Station San Diego



(SCCWRP and U.S. Navy, 2005a)

10.4. Historical Operations

The property on which Naval Base San Diego is now located was deeded to the U.S. government by the City of San Diego on September 3, 1919, to build a docking and fleet repair base. The initial parcel of property consisted of 21 water acres and 77.2 land acres with the former being mostly tidelands and marsh flats. On February 15, 1921, the U.S. Navy acquired the land, buildings, and some machinery to establish a San Diego Ship Repair Base.

In February 1922 the U.S. Navy's U.S. Destroyer Base San Diego began operations at the facility with the mission of maintaining 39 decommissioned naval destroyer vessels. The base was used extensively during the 1920s and 1930s for the repair and maintenance of U.S. Navy Destroyer vessels. The following passage describing this activity in an excerpt from the historical magazine "San Diego's Navy" as quoted in the Port District's section 13267 investigative report (SDUPD, 2004):

> *"In mid-1923, the destroyer base was caring for eighty-four decommissioned destroyers. During 1924 seventy-seven of these destroyers were decommissioned and seven recommissioned. Destroyers were hauled up on the marine railway, their hulls cleaned of marine growth and rust and painted (many times with an orange-red paint undercoat that led to the public's nickname of "Red Lead Row" for San Diego's Reserve ships). All machinery was opened, dried, and treated with oil or heavy coats of grease. Piping connections were blanked off to prevent flooding and fuel (sic), and the water tanks were drained and cleaned. When the Navy closed its submarine base in San Pedro during 1923-25, it transferred repair and upkeep responsibility of fleet submarines to San Diego (SDUPD, 2004)."*

From the late 1930s to the late 1940s the base was expanded through a succession of land acquisition and facility development programs. The base expansion included leasing a parcel of property located within the present day NASSCO leasehold (discussed in Section 10.4.2 below). In 1943, the Destroyer Base was renamed U.S. Naval Repair Base San Diego to reflect an expanding industrial capacity and changing role. From 1943 to 1945, more than 5,000 ships were sent to the base for conversion, overhaul, battle damage repair, and maintenance; approximately 2,190 of these ships were dry-docked. In January 1944, the base was expanded to include approximately 823 acres, over 200 buildings, a 1,700 ton marine railway, a cruiser graving dry dock, five large repair piers, quay wall totaling 28,000 feet of berthing space and extensive industrial repair facilities. In 1946, the base was designated Naval Station San Diego with the primary mission of providing logistical support, including ship repair and dry docking, to locally based units of the US Naval fleet. NBSD remains in operation and is currently homeport for approximately 60 naval vessels and home base to 50 separate commands.

10.4.1. Installation Restoration Sites

Information on historical operations conducted at NBSD was submitted to the San Diego Water Board under the U.S. Navy's Installation Restoration (IR) program.[68] As a part of the IR an Initial Assessment Study[69] was conducted by the U.S. Navy that identified a number of past activities at NBSD that may have resulted in the discharge of pollutants to San Diego Bay in years past. Information regarding these activities obtained from the Initial Assessment Study as well as subsequent studies[70] is summarized in the subsections below.

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[68] The U.S. Navy's Installation Restoration (IR) program administered under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The purpose of the IR program is to identify, assess, characterize and cleanup or control contamination from past hazardous waste disposal operations and hazardous materials spills at U.S. Navy and Marine Corps installations.

[69] Initial Assessment Study of Naval Station, San Diego, California. SCS Engineers Inc. May 1986.

[70] Navy Clean 3 Program, Final Site Management Plan, Naval Station San Diego, San Diego, California, CTO-0020/0068, July 2002.

10.4.1.1. Former Ship Repair Basins

Between the years 1943 and 1945, more than 5,000 ships were sent to what was then called U.S. Naval Repair Base San Diego for conversion, overhaul, and repair. Many ship repair operations were conducted in four basins that were used as ship repair wet docks. Basins 1 and 2 were located north of present day Pier 11 and Basins 3 and 4 are located south of present day Pier 11, approximately 1.7 miles south of the present day Shipyard Sediment Site. The four basins measured approximately 400 feet long, 80 feet wide and 38 feet deep. The basins were constructed of steel sheet piling with concrete sides and were unlined at the bottom. The basins were enclosed on the San Diego Bay side by a reinforced concrete quay wall that U.S. Navy aerial photographs indicate was in place by 1953. The U.S. Navy reported that hazardous materials were not routinely disposed of in the basins during their years of operation and that less than 1000 gallons of waste oil and sludge were disposed of in the basins between 1940 and 1945.

In 1945, the U.S. Navy ceased use of the basins for ship repair. Decommissioning of naval vessels was conducted at Piers 8 and 12. From 1945 through 1972, Basins 3 and 4 were used as informal disposal sites for hazardous and non-hazardous solid waste. Materials filled and disposed in the ship repair basins included demolition spoil, debris and rubble, solid waste, scrap metals, lubricants and oils from decommissioned ships as well as wastes from other facilities at NBSD. U.S. Navy records indicate that Basins 3 and 4 received approximately 4,200 gallons of oils and sludges. The quantity of debris in the basins is unknown; however the sizes of Basins 3 and 4 indicate they may hold up to 88,000 cubic yards of debris and soil. The U.S. Navy reported that Basins 1 and 2 had a limited period of operation from approximately 1941 through 1945, and that aerial photographs indicate the basins were filled by 1946. Basins 1 and 2 combined may contain up to 118,000 cubic yards of fill material. By 1972 all four ship repair basins were paved over with asphalt and or concrete for use as parking lots or as a site for other facilities.

Chemical constituents identified in Ship Repair Basins 3 and 4 in the U.S. Navy's 1990s IR Program site investigations included lubricants, oils, metals, PCBs, volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). In 1998, approximately 16 tons of PCB and PAH impacted soil was removed from the upper 10 feet of Basin 4 as part of an initial cleanup action to eliminate potential human health risks. The impacted soil was hauled to a regulated off-site landfill for disposal.

10.4.1.2. Mole Pier

The Mole Pier is a 22 acre triangular area bounded by 7th Street and Paleta Creek to the north, Cummings Road to the east, and Mole Road to the south. The area is located near present day Pier 9 adjacent to Paleta Creek and only a few hundred feet from San Diego Bay, approximately 1.5 miles south of the Shipyard Sediment Site. Mole Pier was created in 1942 with hydraulic fill material from San Diego Bay. By 1945, Mole Pier was enclosed with earthen berms and designated a disposal area. Materials such as creosote–coated pier pilings, lumber, refuse concrete, waste paints, gasoline, solvents, oil, and diesel fuel were burned at the site between approximately 1945 and 1972. During the 1970s, trucks and heavy equipment were routinely decontaminated by spraying with diesel fuel and using a crane to dunk the vehicles into Paleta Creek. It is estimated that approximately 500,000 gallons of fuel was sprayed, burned, or buried in this area during its years of operation. Hazardous wastes that were burned or buried at the Mole Pier area are listed in Table 10-1 below.

Table 10-1 Hazardous Wastes Burned or Buried at the Mole Pier Area

Waste	Source	Time Period	Estimated Total Quantity
Motor Oils, diesel fuel, gasoline hydraulic fluid	NBSD Vehicle Maintenance	1945-1963	400,000 Gallons
	Naval Repair Facility	1945-1964	140,000 Gallons
Stoddard Solvent	NBSD Vehicle Maintenance	1945-1963	2,800 Gallons
	Naval Repair Facility	1967-1972	1,000 Gallons
Mixed Solvents (acetone, MEK, toluene, methylene chloride)	Naval Repair Facility	1945-1964	6,000 Gallons
	Naval Public Works Center	1967-1970	1,000 Gallons
Mineral spirits	Naval Public Works Center	1967-1970	18,000 Gallons
Carbon remover (phenol, cresol, chlorinated hydrocarbons)	NBSD Vehicle Maintenance	1945-1963	500 Gallons
Methylene Chloride	Naval Development and Training Center	1967-1972	2,400 Gallons
Chlorinated solvents, unidentified	Naval Development and Training Center	1967-1972	1,000 Gallons
	Naval Repair Facility	1945-1964	20,000 Gallons
Sandblast Grit	Shore Intermediate Maintenance Activity	1950-1965	320,000 Pounds
	Naval Public Works Center	1963-1972	2,700,000 Pounds

Potential pollutant transport mechanisms to Paleta Creek and San Diego Bay during the Mole Pier years of operation (1945 through 1972) include direct deposition, air transport, surface water runoff, and pollutant movement through the highly to moderately permeable (10^{-2} to 10^{-3} cm/sec) fill material underlying the site. Chemical constituents identified at the Mole Pier Site from past discharges in the U.S. Navy's 1990s IR Program site investigations included fuels, oils, solvents, paint sludges, metals, TPH, VOCs, SVOCs, dibutyltin, monobutyltin, tetrabutyltin, and tributyltin. As of 2001, approximately 64,000 cubic yards of impacted soil was removed from the Mole Pier site as part of an initial cleanup action and hauled to a certified off-site landfill for disposal.

10.4.1.3. Salvage Yard

Between the years 1943 to about 1975, the U.S. Navy operated a salvage yard to receive, sell, donate, and dispose of excess Navy materials in an area approximately 1,050 feet by 300 feet in the south central portion of NBSD. Paleta Creek borders the site to the south – southeast at a point approximately 1.6 miles south of the Shipyard Sediment Site. Harbor Drive and Cummings Road border the site to the northeast and southwest, respectively. The U.S. Navy reports that items and materials handled by the site included transformers containing PCBs, mercury, electrolytes from old batteries, drummed petroleum wastes, solvents and thinners, refuse, demolition debris, infectious wastes from medical and dental clinics, and spoiled food items from incoming Navy vessels. It is estimated that between 100 and 200 drums per month of waste lubricating oil, lubricants, solvents, and acid alkaline solutions were transported to the site during its operation for handling. Liquid waste was typically incinerated, drained onto the ground, or recycled. Material that could not be sold, reused or donated was incinerated at the Site. The U.S. Navy's estimated quantities of pollutants drained onto the ground at the site are presented in Table 10-2 below. Potential pollutant pathways to Paleta Creek and San Diego Bay during the Salvage Yard's years of operation would have included surface water runoff and pollutant movement through the highly to moderately permeable (10^{-2} to 10^{-3} cm/sec) fill material underlying the site. Part of the salvage yard was located adjacent to Paleta Creek, which flows into San Diego Bay approximately 1200 feet west of the salvage yard site.

Table 10-2 Quantity of Pollutants Estimated Drained to Ground

Waste	Source Of Waste	Time Period	Estimated Total Quantity
Dielectric Fluids	Electrical shops at all San Diego Naval Facilities	1943-1975	7,500 – 15,000 Gallons
Mercury	Torpedoes, compasses, ballast tanks	1943-1975	750 – 1,800 Pounds
Waste Oils, Solvents Thinners	All San Diego naval facilities	1943-1975	15,000 – 110,000 Gallons
Battery Acids	Transportation	1943-1975	Unknown Quantity
Silver Nitrate	Photo Processing	1943-1975	Unknown Quantity

Chemical constituents identified at the Salvage Yard Site during the course of the U.S. Navy's IR Program site investigation included PCBs and lead. During 1996-1997, approximately 22,000 cubic yards of impacted soil were removed from the site as part of a cleanup action. The impacted soil was hauled to a certified off-site landfill for disposal.

10.4.1.4. Defense Property Disposal Office (DPDO) Storage Yard

Between the years 1943 through 1981, a 180,000 square foot area was designated for use as a storage yard. The former storage yard lies east of Harbor Dive and north of Paleta Creek at a point approximately 1.4 miles south of the Shipyard Sediment Site. Prior to 1975 the surface was reportedly oiled regularly as a dust-control measure. The U.S Navy reports that an estimated 35,000 to 75,000 gallons of oil were spread on the site as a dust control measure. This oil consisted of various waste petroleum, oils, and lubricants. In addition, containers of electrical insulating oils were stored at the site during the 1970s. Some of the containers reportedly leaked but no estimated quantities are available. The storage yard was paved with asphalt in 1975 and is currently used for parking and boat storage. Potential pollutant pathways to Paleta Creek and San Diego Bay during the storage yard's years of operation would have included surface water runoff and pollutant movement through the highly to moderately permeable (10^{-2} to 10^{-3} cm/sec) fill material underlying the site. Part of the storage yard was located adjacent to Paleta Creek along its southern edge, which flows into San Diego Bay approximately 1400 feet west of the storage yard site. Chemical constituents identified at the Salvage Yard Site in the U.S. Navy's 1990s IR Program site investigations have included petroleum, PCBs, and metals.

10.4.1.5. City of San Diego Sewage Treatment Plant

Between the years 1943 through 1963 the City of San Diego owned and operated its main sewage treatment plant at a location in NBSD bounded on the east by Harbor Drive, on the south by Vesta Street, and on the north by Knowlton Williams Road. During its initial years of operation from 1943 to 1950, the 14 million gallon per day (MGD) capacity plant was known as the 32nd Street Sewage Treatment Plant. In 1950 the plant capacity was expanded to 40 MGD capacity to accommodate increasing sewage flows resulting from San Diego's rapidly increasing population. The plant was renamed the Bayside Treatment Plant and was also sometimes referred to as the Harbor Drive Treatment Plant. The sewage treatment plant facilities consisted of maintenance and administration buildings, anaerobic digesters, clarifiers, elutriation tanks, sludge handling facilities, and other associated facilities. Effluent from the sewage treatment plant was discharged into an outfall pipeline and conveyed into San Diego Bay at a point 35 feet below the water line near present day Pier 5, approximately 0.9 miles south of the Shipyard Sediment Site. The Bayside Treatment Plant discharge would typically have included pollutants such as biochemical oxygen demand, suspended solids, grease and oils, metals, bacteria, and pathogens.

San Diego Bay water quality conditions drastically deteriorated during the years 1951-1963 due to the pollution effects caused by Bayside Treatment Plant discharge and other sewage, sludge, and industrial waste discharges entering the bay from various sources (Fairey et al 1996). Dissolved oxygen concentrations in the Bay declined to about half normal levels and turbidity in the water resulted in a visibility of less than 1 meter. Bait and game fish had virtually disappeared from the Bay. Coliform bacteria were routinely isolated from the Bay at significant levels. In 1955, the State Board of Public Health and the San Diego Department of Public Health declared much of the Bay contaminated, and posted quarantine and warning signs along 10 miles of shoreline. By 1963, sludge deposits from the treatment plant outfall were two meters deep, extended 200 meters seaward, and along 9000 meters of the shoreline. In 1960 the U.S. Navy began to complain that the Bayside Treatment Plant discharge was causing advanced corrosion to the hulls of naval ships while in port and that the sewage plant should be moved.[71] (Jamieson, 2002)

[71] The ship hull corrosion was reportedly caused by electrolysis of the very high levels of organic matter present in San Diego Bay waters at the time. The U.S. Navy estimated at the time that the excessive corrosion was costing $1.5 million dollars a year in repairs.

In 1960, San Diego voters approved a bond ($42.5 million) for construction of a new Metropolitan Sewerage System to alleviate the severe pollution conditions in San Diego Bay. In August 1963, the new collection, treatment, and ocean disposal system began operation when the Point Loma Sewage Treatment Plant and its two-mile Pacific Ocean outfall became operational. By February 1964, domestic sewage disposal had been totally eliminated in San Diego Bay. Following the termination of the sewage discharge the sludge banks that blanketed the eastern shore of the bay gradually disappeared and dissolved oxygen levels returned to normal.

10.4.1.6. Firefighting Training Facility

Between the years 1945 through 1995 the U.S. Navy operated a fire–fighting training facility at 1000 feet long by 200 feet wide site near Pier 8, approximately 1.3 miles south of the Shipyard Sediment Site. Training fires were lit at the facility using petroleum hydrocarbons, including approximately 3500 gallons per week of jet propellant grade 5 fuel (JP-5) and gasoline. In 1972 the training facility was redesigned with pollution control equipment. Quench water generated from each firefighting exercise was directed into a series of underground concrete tanks in the southwest portion of the site after passing through several oil water separators. Chemical constituents identified in soil and groundwater at the site in the U.S. Navy's IR Program site investigations included benzene, ethylbenzene, toluene, xylenes, and TPH (primarily JP-5) with lesser amounts of gasoline and bunker fuel. Two free product plumes were identified in the ground water resulting from underground pipe leaks at the site in the early 1990s. A multiphase extraction system was operated at the site from 1997 to 2001 that recovered approximately 15,000 gallons of free product. In 1996, the site was paved over and it is now used as a parking lot. The U.S. Navy reported that "the possibility of historical pathways linking site operations at the site and San Diego Bay was uncertain for the years prior to 1972 (when the training facility was redesigned with pollution control equipment).

10.4.1.7. PCB Storage Facility Electrical Storage Yard

Between the years 1981 through 1994 the U.S. Navy operated a PCB storage facility at a location approximately 1200 feet northwest of Paleta Creek and approximately 1000 feet east of San Diego Bay. The site is bounded on the south by Civic Center Drive. This location is approximately 1.2 miles south of the Shipyard Sediment Site. The facility was primarily used for maintenance of electrical equipment, including draining of transformer fluids and storage of fluids containing PCBs. Transformers were historically transported, repaired, and stored on soil, gravel, asphalt, and concrete at various locations throughout the yard. Until the late 1980s no attempt was made to contain fluids or to segregate PCB fluids from other fluids used in the yard. The operation also involved application of waste oil potentially containing PCBs to the ground for dust and weed suppression. The site is currently paved over with asphalt and is currently used as a parking lot. Aroclor 1260 was the primary PCB reported in soil and storm drain samples collected from the site during the course of the U.S. Navy's IR Program site investigation. The reported PCB concentrations ranged from below the detection limit to 18,500 mg/kg. PCB impacted soil was removed from the site and a nearby storm drain inlet in 1994. The Department of Toxic Substances Control (DTSC) certified that the site cleanup and site closure was achieved (i.e. no further remedial action was needed). Potential pollutant transport mechanisms to Paleta Creek and San Diego Bay during its years of operation included direct deposition, air transport, surface runoff, and pollutant movement through the highly to moderately permeable (10^{-2} to 10^{-3} cm/sec) fill material underlying the site.

10.4.1.8. Material Storage Yard

Between the years 1939 through 1995 the U.S. Navy operated an unpaved material storage yard on approximately 5 acres of land within NBSD approximately 800 feet east of San Diego Bay. The site is located approximately 1.2 miles south of the Shipyard Sediment Site in an area bounded by Vesta Street to the north, Woden Street to the south and Ward Road to the west. U.S. Navy aerial photographs indicate that the site was used as an unpaved storage yard for metal finishing, preservation, and packaging at Building 321. Operations conducted at this area from 1955 through 1996 included the use of solvents and corrosives for the cleaning of metals. The site is currently paved over and is primarily used as a parking lot. The primary pollutants identified in soil at the site during the course of the U.S. Navy's IR Program site investigations in the 1990s included metals, PAHs and PCBs. The dominant potential pollutant transport mechanism to San Diego Bay during the storage yard's years of operation was surface water runoff.

10.4.1.9. Brinser Street Parking Area

Between the years 1941 through 1945 the U.S. Navy constructed floating dry docks and barges at a site within NBSD near Pier 7, approximately 1.2 miles south of the Shipyard Sediment Site. Facilities at the site included two shallow creosote dip ponds used to treat lumber on the site. The site was paved over in 1966 and was subsequently used as a parking lot, a staging area for military equipment, and for shipping and receiving. U.S. Navy soil investigations from 1989 through 1992 revealed the presence of petroleum products, PAHs, metals, SVOCs and VOCs. In 1996 about 5,000 tons of PAH impacted soil was excavated and taken off-site to a soil recycling facility. DTSC certified the site cleanup complete in 1998. The dominant potential pollutant transport mechanism to San Diego Bay during the site's years of operation was surface water runoff.

10.4.1.10. Dry Dock Sandblast Area

The dry dock sandblast grit area is located immediately east of Piers 5 and 6, approximately 1.0 mile south of the Shipyard Sediment Site. The site has been used for the overhaul and maintenance of ships, repair of ship components, and contractor equipment storage since 1942. The site includes a dry dock basin that is approximately 700 feet long, 104 feet wide and 42 feet deep. This dry dock can accommodate vessels up to 688 feet long and 90 feet wide with a 30 foot draft.

The operations at this site were and still remain industrial in nature and include sand blasting and painting of ship components. Sandblasting operations began at the site following construction of the dry dock facility in 1942. Copper abrasive blast material was used on naval vessels in the dry dock to remove anticorrosive and antifouling paints[72] from the hulls of ships. Sand blasting

[72] Anticorrosive paints generally contain zinc and chromates, while antifouling paints used by the Navy are currently copper based formulations.

of small ship parts also occurred on the ground outside of the dry dock. Construction drawings reveal that a railcar structure and a sandblast grit storage silo were present in the western portion of the site by 1952. The railcar shelter contained a hopper where copper slag (sandblast grit) was bottom dropped by train. Used grit was reportedly accumulated and collected for recycling. Open-air sand blasting operations took place at the dock until 1993. At that time sandblasting operations reportedly began being conducted under completely tented conditions to eliminate the dispersion of grit via wind.

In October 1992, visible surface contamination consisting of overlying gravel and dark gray grit and dust was removed to approximately 4 inches below grade at the site. The primary pollutants identified in soil at the site during the course of the U.S. Navy's IR Program site investigation included elevated concentrations of arsenic, iron, lead, manganese, thallium, and hexavalent chromium. Ground water samples have indicated elevated levels of copper, nickel, selenium, and dibromochloromethane.

Potential pollutant transport mechanisms to San Diego Bay during the site's years of operation prior to 1993 included air deposition (e.g., windborne dust) and surface water runoff.

10.4.2. Historic Operations within the Present Day NASSCO Leasehold

The U.S. Navy conducted a record review to compile historical information about U.S. Navy leases and use of property within the present day NASSCO shipyard leasehold. The results of the review are contained in the July 15, 2004 technical report entitled *Navy Technical Report Historical Navy Activities at NASSCO Shipyard* (U.S. Navy, 2004) and are summarized below.

Between the years 1938 and 1956 the U.S. Navy occupied a parcel of land at the south end of the current NASSCO leasehold at the foot of 28th Street, including the 28th Street Pier. This parcel was originally leased from the City of San Diego and was considered part of the U.S. Destroyer Base San Diego and was also referred to as the 28th Street Shore Boat Landing Station. The landing consisted of a finger pier that ship launches used to ferry sailors to and from Navy ships moored in San Diego Bay. The remaining northern side of the 28th Street Pier was used for buildings that housed activities including a machine shop, battery shop, planing mill, electric shop, mold loft, mill work office, naval stores, pipe shop, pipe threading area, overhead crane, and boat way. The U.S. Navy reported that information concerning these buildings and activities is limited but it is assumed that the activities were associated with maintaining ships launches and would involve use of materials similar in type to a small boatyard. The U.S. Navy did not maintain records related to the activities, hazardous materials usage, and any waste releases that may have occurred around NASSCO. Based on the historical record review, the U.S. Navy concluded that the industrial activities it conducted on NASSCO's present day leasehold were limited to maintenance of small boat launches. The U.S. Navy acknowledged the possibility that discharges from their boat launch maintenance operations on the north side of 28th Street Pier to the Shipyard Sediment Site may have occurred. However the U.S. Navy characterized these discharges, if they occurred, as being "limited in scale" and causing "… a relatively minimal contribution to elevated sediment contaminant concentrations" at the Shipyard Sediment Site. The U.S. Navy also hypothesized that if pollutants were discharged, they would likely have been removed from San Diego Bay as a result of dredging activities when "… the NASSCO dry dock was built." The U.S. Navy also reported that they "…were unable to find any records indicating the Navy operated a floating dry dock" for painting and blasting operations on the subject property and that "…records from the activities conducted by shops or ships at NASSCO shipyard have not been maintained."

10.4.2.1. Past Discharges within the Present Day NASSCO Leasehold

The U.S. Navy described the activities at the former 28th Street Shore Boat Landing Station as being associated with "…maintaining ships launches and involving use of materials similar in type to a small boatyard" (U.S. Navy, 2004). However, as described in the preceding section, specific documentation on the U.S. Navy's activities and wastes generated is lacking. In the absence of such direct evidence, the San Diego Water Board may consider relevant direct or circumstantial evidence in determining whether a person shall be required to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC section 13304.[73]

10.4.2.2. Industry-Wide Operational Practices That Have Led to Discharges

Commercial boatyards are somewhat analogous to the U.S. Navy's former 28th Street Shore Boat Landing Station in terms of operations, materials used, and wastes generated. Industry-wide commercial boatyard operational practices that have historically led to discharges is a relevant consideration in determining the extent and types of waste discharges that may have occurred from the 28th Street Shore Boat Landing Station to the Shipyard Sediment Site.[74]

Boatyards provide services that are necessary to maintain and repair boats. These services include scrubbing boat hulls to remove attached marine organisms, painting and stripping antifouling hull paints, and other repair services. The hull paints typically contain metals that are toxic to marine organisms thereby retarding marine growth below the water line of a vessel.[75] Various inorganic and organic toxic chemicals have been used in antifouling paints. These include cuprous oxide, arsenic, mercury, and organolead.[76] Other products used at boatyards include solvents and petroleum products. The removal of marine organisms and paint from the boat hull may consist of using mediablasting (e.g., sandblasting, plastic media, etc), hydraulic jet spray (hydroblasting or hydro washing) equipment, or sanding the hull by hand or other mechanical means. Wastes generated from these procedures consist of spent abrasives, wash water, marine growth, old paint, rust, etc.

The various activities at boatyards are typically conducted predominantly in outdoor areas, although some boatyards have indoor working areas as well. The outdoor nature of the majority of these activities exposes various products and waste products to the environment, including

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[73] See section I.A of the State Water Resources Control Board Resolution No. 92-49, *Policies and Procedures for the Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*.

[74] See section 1.A.4 of State Water Resources Control Board Resolution 92-49.

[75] Fouling of boat hulls by marine organisms significantly increases the friction drag on the boat, resulting in increased fuel consumption and reduction in maximum speed. In addition, the attached biota may also damage the hull, clog seawater piping systems, interfere with operating equipment and sound devices, and enhance the corrosion on metal surfaces.

[76] The use of many of these compounds is currently restricted or has been eliminated. Currently, the most commonly used chemical is cuprous oxide.

impervious surfaces (such as asphalt or concrete surfaces throughout the work areas) and to direct discharges to waters of the state (from work conducted directly over or adjacent to the receiving water). Typical boatyard operations are in close proximity to receiving waters and create the potential for discharge to surface waters via waterborne runoff from impervious surfaces, airborne transport of particulates, and via accidental/illicit pollutant releases from spills or otherwise. Some work at boatyards is also conducted on vessels that remain in, or are returned to the receiving water. This topside or interior work may also result in discharges of wastes or pollutants such as particulates from abrasive blasting, sanding, or spilled paints/solvents to receiving waters.

BMPs implemented by the boatyard industry in San Diego prior to the 1990s were deficient in many respects and led to excessive discharges of waste to San Diego Bay. In 1972, the San Diego Water Board initiated an investigation to determine the amount and kinds of pollutants that entered San Diego Bay from shipbuilding and repair facilities, and boatyard facilities and the possible effects that the pollutants could have on beneficial uses of San Diego Bay. As a result of that investigation, the San Diego Water Board concluded that heavy metal concentrations were higher in bay sediment near boatyards and shipyards than in other parts of San Diego Bay.[77] Additional evidence is documented in the series of cleanup and abatement orders issued by the San Diego Water Board to San Diego Bay boatyard owners and operators in the late 1980s.[78] Based on these considerations it is reasonable to assume that BMPs employed by the U.S. Navy at the 28th Street Shore Boat Landing Station during the years of operation (1938 to 1956) were not adequate to prevent discharges to San Diego Bay in the vicinity of 28th Street Pier and that such discharges likely resulted in the accumulation of metals and other pollutants in the marine sediment at that location.

10.4.2.3. Site Characteristics and Location in Relation to Other Potential Sources of Discharge

Consideration of Shipyard Sediment Site characteristics and location in relation to other potential sources of discharge is a relevant consideration in determining the extent and types of waste discharges that may have occurred from the 28th Street Shore Boat Landing Station to the Shipyard Sediment Site.[79] The San Diego Water Board has considered evidence of past discharges from the U.S. Navy's former 28th Street Shore Boat Landing Station to the Shipyard Sediment Site by reviewing pollutant levels in core samples at depths that would reflect pollutant contributions during the years 1938 through 1956.

"Significance of Sediment Resuspension and Tidal Exchange to Reduction of Polychlorinated Biphenyl Mass in San Diego Bay" (Peng et. al. 2003) reports a sedimentation rate of 0.92 centimeters per year (cm/yr) at a sampling station in the vicinity of the Shipyard Sediment Site outside of the current leaseholds. The sedimentation rate may be higher within the leasehold closer to the shoreline since the currents may be less and the shoreline is nearer the source(s) of

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[77] See California Regional Water Quality Control Board, San Diego Region, Wastes Associated with Shipbuilding and Repair Facilities in San Diego Bay, June 1972.

[78] See Regional Board Cleanup and Abatement Order Nos. 88-78, 88-79, 88-86, 89-31, and 89-32.

[79] See section I.A.2. of Resolution No. 92-49.

sediment input. Table 10-3 shows the estimated dates associated with the core depths for two different sedimentation rates. A sedimentation rate of 0.92 cm/yr suggests that the sediment in the 2 to 4 foot core were deposited prior to approximately 1936. Assuming a higher sedimentation rate of 2 cm/yr indicates that the sediment in the 2 to 4 foot core was deposited from approximately 1972 to 1942.

Table 10-3 Estimated Deposition Years for Cores Based on Sedimentation Rates

Core Depth	0.92 cm/year[1]	2 cm/year[2]
0 to 2 feet	2002 to 1936	2002 to 1972
2 to 4 feet	1936 to 1870	1972 to 1942
4 to 6 feet	1870 to 1804	1942 to 1912

1. 0.92 cm/year corresponds to approximately 33 years per foot.
2. 2 cm/year corresponds to approximately 15 years per foot.

The Shipyard Report provides analytic results from sediment cores collected down to depths of approximately 6 to 8 feet (Exponent, 2003). The results from Stations NA17 and NA19, the core locations closest to the former 28th Street Shore Boat Landing Station, are provided in Table 10-4.

The analytical results for tributyltin (TBT) were used to evaluate the applicability of the two deposition rates in Table 10-4. TBT was first used as a marine antifouling coating in the 1960s (GlobalSecurity.org, 2005). Therefore, TBT should not be reported in sediment deposited prior to the 1960s unless TBT in the overlying sediment contaminated the underlying sediment by mechanisms such as bioturbation or disturbances via propeller wash. Review of the core results indicate the presence of significant TBT levels in the cores collected from 2 to 4 feet in stations NA17 and NA19. The deposition rate of 0.92 cm/yr suggests that the sediment at 2 to 4 feet was deposited between 1936 and 1870. However the TBT concentrations suggest that the 2 to 4 ft. core interval includes sediment from the late 1960s or early 1970s (when TBT was first utilized), implying that the actual sedimentation rate was higher than 0.92 cm/year. A deposition rate of 2 cm/year indicates that the sediment in the core from 2 to 4 feet was deposited from 1942 to 1972. These dates are consistent with the presence of TBT in cores collected at the 2 to 4 ft. depth from stations NA17 and NA19 (see Table 10-4). Therefore, the higher deposition rate of 2 cm/year is judged to be more applicable to the Shipyard Sediment Site than the lower 0.92 cm/year rate.

Table 10-4 Selected Results from Core Stations NA17 and NA19

Depth	Contaminant	NA17	NA19
0 to 0.06 feet	PCB homologs µg/kg	620	1,400
0 to 2 feet	PCB homologs µg/kg	880	1,100
2 to 4 feet	PCB homologs µg/kg	720	1,100
4 to 5 feet	PCB homologs µg/kg	3.6	
4 to 6 feet	PCB homologs µg/kg		460

Depth	Contaminant	NA17	NA19
0 to 0.06 feet	Benzo[a]pyrene µg/kg	370	-
0 to 2 feet	Benzo[a]pyrene µg/kg	640	440
2 to 4 feet	Benzo[a]pyrene µg/kg	240	330
4 to 5 feet	Benzo[a]pyrene µg/kg	19	
4 to 6 feet	Benzo[a]pyrene µg/kg		370
0 to 0.06 feet	Tributyltin µg/kg	1,400	570
0 to 2 feet	Tributyltin µg/kg	1,300	1,400
2 to 4 feet	Tributyltin µg/kg	340	120
4 to 5 feet	Tributyltin µg/kg	1.7	
4 to 6 feet	Tributyltin µg/kg		450
0 to 0.06 feet	Arsenic mg/kg	14	14
0 to 2 feet	Arsenic mg/kg	15	17
2 to 4 feet	Arsenic mg/kg	10	13
4 to 5 feet	Arsenic mg/kg	4	
4 to 6 feet	Arsenic mg/kg		4.5
0 to 0.06 feet	Cadmium mg/kg	0.4	0.37
0 to 2 feet	Cadmium mg/kg	0.46	0.84
2 to 4 feet	Cadmium mg/kg	0.62	1.10
4 to 5 feet	Cadmium mg/kg	0.09	
4 to 6 feet	Cadmium mg/kg		0.78
0 to 0.06 feet	Chromium mg/kg	74	65
0 to 2 feet	Chromium mg/kg	84	59
2 to 4 feet	Chromium mg/kg	24	31
4 to 5 feet	Chromium mg/kg	7.5	
4 to 6 feet	Chromium mg/kg		28
0 to 0.06 feet	Copper mg/kg	510	270
0 to 2 feet	Copper mg/kg	450	450
2 to 4 feet	Copper mg/kg	170	160
4 to 5 feet	Copper mg/kg	9	
4 to 6 feet	Copper mg/kg		71
0 to 0.06 feet	Lead mg/kg	110	100
0 to 2 feet	Lead mg/kg	120	120
2 to 4 feet	Lead mg/kg	62	96
4 to 5 feet	Lead mg/kg	6.4	
4 to 6 feet	Lead mg/kg		35

Depth	Contaminant	NA17	NA19
0 to 0.06 feet	Mercury mg/kg	0.84	0.78
0 to 2 feet	Mercury mg/kg	0.89	0.94
2 to 4 feet	Mercury mg/kg	0.39	0.60
4 to 5 feet	Mercury mg/kg	0.05	
4 to 6 feet	Mercury mg/kg		0.87
0 to 0.06 feet	Nickel mg/kg	17	17
0 to 2 feet	Nickel mg/kg	16	18
2 to 4 feet	Nickel mg/kg	8.1	9.9
4 to 5 feet	Nickel mg/kg	3.7	
4 to 6 feet	Nickel mg/kg		8.4
0 to 0.06 feet	Silver mg/kg	1.3	1.1
0 to 2 feet	Silver mg/kg	1.5	1.6
2 to 4 feet	Silver mg/kg	0.66	0.72
4 to 5 feet	Silver mg/kg	0.03	
4 to 6 feet	Silver mg/kg		0.81
0 to 0.06 feet	Zinc mg/kg	620	450
0 to 2 feet	Zinc mg/kg	550	850
2 to 4 feet	Zinc mg/kg	380	540
4 to 5 feet	Zinc mg/kg	24	
4 to 6 feet	Zinc mg/kg		210

(Exponent, 2003)

There are uncertainties associated with this analysis. The estimated age associated with the core depths is dependent upon the sedimentation rate. There has been very little maintenance dredging reported at the Shipyard Sediment Site, which suggests that the deposition rate is low, in the order of 2 cm/year or less. Dredging was performed in 1981 for NASSCO's floating dry dock. However, the dredge footprint for NASSCO's floating dry dock does not include the entire area occupied by the U.S. Navy on the northwest side of the 28th Street Pier, thus historical discharges to the Shipyard Sediment Site by the U.S. Navy were not removed by the dredging for the dry dock.

Physical disturbances, such as bioturbation, dredging, and propeller wash, also introduce uncertainty into this interpretation. For example, if propeller wash from ship movements removes material from the bottom, the shallow sediment may be older than that indicated by applying the sedimentation rate. If disturbances result in redeposition of older sediment on top of newer sediment, the shallow sediment may be older than interpreted.

The Shipyard Report uses the presence of graded bedding in the sediment profiles to identify areas of no apparent physical disturbance. Stations NA17 and NA19 were reported to be stations with no apparent physical disturbance (Exponent, 2003). Therefore, assuming a deposition rate of 2 cm/year, it is likely that the pollutants reported in the sediment between 3 feet and 4.2 feet are from discharges between 1938 and 1956.

As indicated in Table 10-4, there are metals, PAHs, and PCBs above the tentative cleanup levels in the cores collected from 2 to 4 feet at stations NA17 and NA19. Therefore, it is likely that the pollutants reported in 2 to 4 foot cores at Stations NA17 and NA19 include discharges during the time of U.S. Navy operations at their 28th Street Shore Boat Landing Station.

10.4.2.3.2. Lack of Documentation of Responsible Management of Materials and Waste

According to the U.S. Navy's July 15, 2004 submittal to the San Diego Water Board, information concerning industrial activities conducted by the U.S. Navy in the area of the NASSCO leasehold is limited (U.S. Navy, 2004):

> *"… but it is assumed that these shops maintained ship's launches and would manage materials similar in type to a small boatyard. Records related to activities at these shops are unavailable. A search for records concerning hazardous material usage, waste disposal and any releases that may have occurred in and around NASSCO were nonproductive. Records from the activities conducted by shops or ships docked at NASSCO shipyard have not been maintained."*

As stated in Section 10.2 "lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal" is relevant evidence which the San Diego Water Board may consider in determining whether a party shall be required to clean up waste and abate the effects of discharge.

10.4.2.4. Other Records of Possible Known Discharge

Communications from NASSCO to the San Diego Water Board indicate that ADFL-37 floating dry dock was owned by the U.S. Navy and leased to NASSCO for a few years (Bermudez, 2005). As discussed in Section 10.4.2 the U.S. Navy reported that they "… were unable to find any records indicating the Navy operated a floating dry dock for painting and blasting operations" on the NASSCO leasehold. NASSCO did not submit any pertinent details on terms of the lease, the location of the floating dry dock on NASSCO's leasehold, the time period the floating dry dock was in operation, or the role the U.S. Navy played in operating the floating dry dock. The U.S. Navy's alleged ownership of ADFL-37 floating dry dock and the leasing of it to NASSCO for use in NASSCO's ship repair and construction activities does not constitute a sufficient basis to establish that the U.S. Navy caused or permitted the discharge of waste to the Shipyard Sediment Site.

10.5. Current Operations

NBSD is currently homeport for approximately 60 naval vessels and home base to 50 separate commands including major commands such as Fleet Training Center (FTC); Navy Public Works Center (PWC); Supervisor of Shipbuilding, Conversion, and Repair (SUPSHIP); Shore Intermediate Maintenance Activity (SIMA); and the Naval Supply Center (NSC). Each of these commands has specific and specialized fleet support purposes. NBSD is the workplace for approximately 48,000 military and civilian personnel.

NBSD currently occupies 1,029 acres of land and 326 water acres at the site lying east and west of Harbor Drive. The wetside consists of the San Diego Bay front area west of Harbor Drive in the City of San Diego. The dryside consists of the community facilities complex east of Harbor Drive.

10.5.1. Naval Station San Diego - Wetside

NBSD wetside located west of Harbor Drive is intensively developed and supports waterfront operations, ship berthing and maintenance, station maintenance, training, administration, and logistics functions. Operational facilities include piers, quay walls, a graving dock, small craft berthing facilities, fueling facilities, armories, and waterfront operations buildings. The straight-line map measurement of the shoreline at NBSD is approximately 1.6 miles. NBSD contains 13 berthing piers, a mole pier, two channels, one graving dock, one floating dry dock, and various quay walls that have a total shoreline measurement of approximately 5.6 miles.

10.5.1.1. Piers

The 13 piers at NBSD are used to berth surface ships, support vessels, and barges. The surface ships, support vessels, and barges receive various ship support services such as supplies and minor repair or maintenance when berthed. Ship support services on the 13 piers include loading supplies and equipment onto the ships. Berth side ship repair and maintenance conducted while the vessel is docked at the pier may include abrasive blasting, hydro-blasting, metal grinding, painting, tank cleaning, removal of bilge and ballast water, removal of anti-fouling paint, sheet metal work, electrical work, mechanical repair, engine repair, hull repair, and sewage disposal. Berth side ship repair activities are generally less complex than the ship repair activities conducted at commercial shipyards or at the U.S. Navy's graving dock or floating dry dock. Naval personnel (ships' force), civil service personnel, and civilian contractors conduct berth side maintenance. The diverse discharges from ship repair and maintenance activities could occur at several locations, including aboard ship when docked, on the piers, or on shore locations.

Ship repair activities may also be conducted on the piers. Boats, ship sections, or parts can be placed on the piers or adjacent lands for repairs. The ship repair activities may be conducted by U.S. Navy personnel (ships' force), civil service personnel, and civilian contractors. The breadth of work performed by the civilian contractors is typically greater than the work performed by ships' force. Most of the more complex ship repair work is conducted on ships berthed at Pier 13. Typically, civilian contractors will store materials and supplies on Pier 13 while working aboard the ship berthed at the Pier. However, ship repair activity is not limited to ships berthed at Pier 13. NBSD also has several SIMA repair shops at the facility. The SIMA repair shops conduct repairs on various parts of the vessels, such as antenna repair or mechanical repairs.

10.5.1.2. Graving Dock

The U.S. Navy Graving Dock facility occupies slightly more than six acres of land just south of Pier 5 at the NBSD. The facility is used for periodic maintenance and repair of U.S. Navy ships. The dock basin is approximately 700 feet long, 104 feet wide, and 42 feet deep and can accommodate vessels up to 688 feet long and 90 feet wide with a 30 foot draft. The U.S. Navy Graving Dock has an annual average of three ships in for repairs or maintenance. During ship repair operations, private contractors perform repair and overhaul work on vessels scheduled by the U.S. Navy, under contract to SUPSHIP. The industrial activity is limited to facility maintenance and vehicle parking when ship repair activity is not occurring. Operations at the U.S. Navy Graving Dock generate or have the potential to generate discharges of waste to San Diego Bay. The discharges may include industrial process water and/or storm water contaminated with abrasive blast material, paint, oils, lubricants, fuels, or solvents.

10.5.1.3. Other Land Parcels

Two land parcels within the NBSD perimeter are not under the control of NBSD. A 25.8-acre compound is owned by Naval Supply Center, and 40 acres of railroad right-of-way is owned by the Atchison, Topeka & Santa Fe Railroad (AT&SF) and the Metropolitan Transit Development Board (MTDB). Interstate 5, Harbor Drive, and various public utilities occupy 54.51 acres of NBSD real estate under easement or permit. There are no discharges reported as being associated with the land parcels not under the control of NBSD.

10.5.2. Naval Station San Diego - Dryside

NBSD dryside consists of the community facilities complex east of Harbor Drive. The MS4s east of Harbor Drive discharge into Chollas Creek. The entire watershed contributing to Chollas Creek drains a total of approximately 16,273 acres of land. The area of NBSD draining to Chollas Creek is approximately 266 acres. The U.S. Navy reports that there are at least 8 “non industrial” MS4 storm drains and 30 non-industrial sheet flow discharge points that discharge urban runoff from NBSD – Dryside directly to Chollas Creek (Chichester, 2006).

10.6. U.S. Navy Discharged Waste to San Diego Bay Creating Pollution, Contamination, and Nuisance Conditions in San Diego Bay

The U.S. Navy has caused or permitted discharges of pollutants from NBSD to San Diego Bay and has contributed to both the levels of pollutants, and the pollution and nuisance conditions, found at the Shipyard Sediment Site. ~~CWC~~ Water Code section 13304 provides that a person who causes any waste to be discharged, or deposited where it probably will be discharged, into waters of the state creating, or threatening to create, a condition of pollution or nuisance is subject to cleaning up or abating the effects of the waste.

The Porter-Cologne Water Quality Act defines "pollution" as "an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects … the waters for beneficial uses.…"[80] "Contamination" is defined as "an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."[81]

Pollutants generated at NBSD were discharged in storm water to San Diego Bay, transported via tides and ship movement, and discharged directly to the Shipyard Sediment Site from the 28th Street Shore Boat Landing Station as a result of U.S. Navy operations. The pollutants include metals, butyl tins, PCBs, PCTs, PAHs, and TPH. Many of these same pollutants are present in the marine sediment of the Shipyard Sediment Site in highly elevated concentrations as compared to sediment chemistry levels found at off-site reference stations located in areas of San Diego Bay.[82]

Based on the evidence presented in Sections 10.8, 10.9 and 10.10 of this Technical Report, the U.S. Navy has a history of discharging pollutants at levels that have contributed to a condition of pollution, contamination, or nuisance at the Shipyard Sediment Site. As described in Sections 14 through 28 of this Technical Report these same pollutants in the discharges have accumulated in San Diego Bay sediment at levels that may:

11. Adversely affect the beneficial uses of San Diego Bay as described in later sections of this Technical Report,

12. Cause pollution, contamination, or nuisance conditions in San Diego Bay; and

13. Degrade marine communities, cause adverse effects on the environment or the public health, or result in harmful concentrations of pollutants in marine sediment.

Accordingly, it is concluded that the U.S. Navy has caused or permitted the discharge of waste to Chollas Creek and San Diego Bay in a manner causing the creation of pollution or nuisance conditions. These discharges have contributed to both the levels of pollutants and the pollution and nuisance conditions found at the Shipyard Sediment Site through the pollutant transport pathways. It is appropriate for the San Diego Water Board to name the U.S. Navy as a discharger pursuant to Water Code section 13304 in the CAO.~~issue a cleanup and abatement order naming the U.S. Navy as a discharger pursuant to CWC section 13304.~~

Further discussion on pollution, contamination, and nuisance are available in Sections 1.4 and 1.5 of this Technical Report.

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80 Water Code section 13050(1).

81 Water Code section 13050(k).

82 See Section 16 of this Technical Report.

10.7. U.S. Navy NPDES Requirement Regulation

In 1992, NBSD obtained coverage under the State Water Board's General Industrial Storm Water National Pollutant Discharge Elimination System (NPDES) Requirements for the discharge of industrial storm water. A listing of successive General Industrial Storm Water Permits adopted by the State Water Board since 1991 and applicable to NBSD industrial storm water discharges is provided in Table 10-5 below.

Table 10-5 NBSD's General Industrial Storm Water NPDES Requirements

Order Number / NPDES No.	Order Title	Adoption Date	Expiration Date
91-13-DWQ, Industrial NPDES No. CAS000001	Waste Discharge Requirements (WDRs) For Discharge Of Storm Water Associated With Industrial Activities Excluding Construction Activities	November 19, 1991 (Notice of Intent Filed November 4, 1992)	April 17, 1997 (Notice of Intent Filed July 8, 1997)
97-03-DWQ, Industrial NPDES No. CAS000001	Waste Discharge Requirements (WDRs) For Discharge Of Storm Water Associated With Industrial Activities Excluding Construction Activities	April 17, 1997 (Notice of Intent Filed July 8, 1997)	(Notice of Termination Approved) November 13, 2002

The General Industrial Storm Water Permit required NBSD to develop and implement plans to limit its discharges of pollutants from storm water runoff into San Diego Bay. Rather than relying on specific numerical effluent limitations, the General Permit directed NBSD to create and follow "Best Management Practices"[83] (BMPs). The General Industrial Storm Water NPDES Requirements also required NBSD to develop and implement a Storm Water Pollution Prevention Plan (SWPPP) and a storm water Monitoring and Reporting Program Plan (MRPP). The requirements specified that the SWPPP include, among other things, the following:

- Descriptions of sources that might add significant quantities of pollutants to storm water discharges;
- A detailed site map;
- Descriptions of materials that had been treated, stored, spilled, disposed of, or leaked into storm water discharges since November 1988;
- Descriptions of the management practices that were employed to minimize contact between storm water and pollutants from vehicles, equipment, and materials;

[83] Best management practices ("BMPs") means schedules of activities, prohibitions of maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

- Descriptions of existing structural and non-structural measures to reduce pollutants in storm water discharges;
- Descriptions of methods of on-site storage and disposal of significant materials;
- Descriptions of outdoor storage, manufacturing, and processing activities;
- A list of pollutants likely to be present in significant quantities in storm water discharges and an estimate of the annual amounts of those pollutants in storm water discharge;
- Records of significant leaks or spills of toxic or hazardous pollutants to storm water;
- A summary of existing data describing pollutants in storm water discharge;
- Descriptions of storm water management controls, including good housekeeping procedures, preventive maintenance, and measures to control and treat polluted storm water; and
- A list of the specific individuals responsible for developing and implementing the SWPPP.

NBSD developed the MRPP and has implemented it since 1994. NBSD's MRPP identified 56 outfalls as industrial storm water outfalls that discharge to San Diego Bay. Typically, less than half of the 56 outfalls were sampled during rain events, pursuant to the General Industrial Storm Water NPDES Requirements.

In 2002, the San Diego Water Board issued Order No. R9-2002-0169, NPDES Permit No. CA0109169, *Waste Discharge Requirements for U.S. Navy, Naval Base San Diego (NBSD), San Diego County* (hereinafter NBSD NPDES Requirements or NBSD Permit). The NBSD NPDES Requirements regulates point source discharges from NBSD and three other San Diego naval installations.[84] The NBSD Permit incorporated and superseded the SWPPP and MRPP requirements of NBSD's previous General Industrial Storm Water NPDES Requirements. Order No. 2002-0169 currently regulates the following point source discharges from NBSD to San Diego Bay:[85]

- Utility vault & manhole dewatering,
- Steam condensate,
- Salt water system discharge,

[84] The Naval Base San Diego (NBSD) Complex includes four installations: (1) Naval Station, San Diego (NAVSTA); (2) Mission Gorge Recreational Facility (MGRF); (3) Broadway Complex; and (4) Naval Medical Center, San Diego (NMCSD).

[85] The following point source discharges from the NBSD Graving Dock facility are currently regulated under separate NPDES requirements contained in Order No. R9-2003-0265, *Waste Discharge Requirements for United States Navy Graving Dock Located at Naval Station San Diego, San Diego County*: (1) Saltwater supply system water, (2) Caisson gate ballast water, (3) Graving dock flood dewatering, (4) Ship repair and maintenance activities, and (5) Industrial storm water.

- Pier boom, mooring, and fender system cleaning,
- Miscellaneous discharges (landscape watering runoff, potable water & fire system maintenance),
- Ship repair and maintenance activities, and
- Industrial storm water.

Order No. 2002-0169 remains in effect as provided in Table 10-6 below.

Table 10-6 NBSD NPDES Requirements

Order Number / NPDES No.	Order Title	Adoption Date	Expiration Date
R9-2002-0169, NPDES No. CA0109169	Waste Discharge Requirements For U.S. Navy, Naval Base San Diego, San Diego County	November 13, 2002	Present

Pursuant to the NBSD NPDES Requirements cited above, NBSD was required to develop and implement BMP plans to limit discharges of pollutants into San Diego Bay. As described in the NBSD NPDES requirements (Order No. R9-2002-0169), BMPs may be "structural" (e.g., tarpaulins and shrouds to enclose work areas, retention ponds, devices such as berms to channel water away from pollutant sources, and treatment facilities) or "non-structural" (e.g., good housekeeping, preventive maintenance, personnel training, inspections, and record-keeping).

10.7.2. Order No. 91-13-DWQ, NPDES Permit No. CAS000001, General Industrial NPDES Requirements for Storm Water Discharges

Order No. 91-13-DWQ, NPDES Permit No. CAS000001, in effect from November 4, 1992 to July 8, 1997 contained the following narrative limitations that relate to the discussions contained herein:

- A. DISCHARGE PROHIBITIONS … 3. Storm water discharges shall not cause or threaten to cause pollution, contamination, or nuisance; and

- B. RECEIVING WATER LIMITATIONS … 1. Storm water discharges to any surface or ground water shall not adversely impact human health or the environment.

- B. RECEIVING WATER LIMITATIONS … 2. Storm water discharges shall not cause or contribute to a violation of any applicable water quality standards contained in the California Ocean Plan, Inland Surface Water Plan, Enclosed Bays and Estuaries Plan, or the applicable San Diego Water Board's Basin Plan.

10.7.3. Order No. 97-03-DWQ, NPDES Permit No. CAS000001, General Industrial NPDES Requirements for Storm Water Discharges

Order No. 97-03-DWQ, NPDES Permit No. CAS000001, in effect from July 8, 1997 to November 13, 2002 contained the following narrative limitations that relate to the discussions contained herein:

- A. DISCHARGE PROHIBITIONS … 3. Storm water discharges and authorized non-storm water discharges shall not cause or threaten to cause pollution, contamination, or nuisance; and

- C. RECEIVING WATER LIMITATIONS … 1. Storm water discharges and authorized non-storm water discharges to any surface or ground water shall not adversely impact human health or the environment.

- C. RECEIVING WATER LIMITATIONS … 2. Storm water discharges and authorized non-storm water discharges shall not cause or contribute to an exceedance of any applicable water quality standards contained in a statewide Water Quality Control Plan or the applicable Regional Water Board's Basin Plan.

10.7.4. Order No. R9-2002-0169, Naval Base San Diego NPDES Permit No. CA0109169

Order No. R9-2002-0169, NPDES Permit No. CA0109169, in effect from November 13, 2002 to the present, contains the following narrative limitations that relate to the discussions contained herein:

- A. PROHIBITIONS … 5. Industrial storm water discharges and authorized or permitted non-storm water discharges shall not cause or threaten to cause pollution, contamination, or nuisance as defined in CWC section 13050; and

- B. DISCHARGE SPECIFICATIONS … 1. The discharger shall not cause pollution, contamination, or nuisance, as those terms are defined in CWC section 13050, as a result of the treatment or discharge of wastes; and

- C. RECEIVING WATER LIMITATIONS … 1. The discharge of wastes shall not cause or contribute to an exceedance of any applicable water quality objective or standards contained in a state Water Quality Control Plan, the CTR, or the San Diego Basin Plan; and

- C. RECEIVING WATER LIMITATIONS … 2. Storm water discharges and authorized non-storm water discharges to any surface or ground water shall not adversely impact human health or the environment.

10.7.5. NBSD's Outfall Locations

NBSD's MRPP identified 56 outfalls as industrial storm water outfalls that discharge to San Diego Bay. Typically less than half of the 56 outfalls were monitored under the terms of the MRPP. Various outfalls were sampled over time, but in general, the twenty-one outfalls in Table 10-7 below were included:

Table 10-7 NBSD Outfall Locations

Industrial Storm Water Outfall	Location Description	Receiving Water
Outfall 5	24-inch diameter pipe west of Building 3116 between Pier 3 & Pier 4. A 12-inch diameter pipe is located about 4-feet above the outfall. Drainage area includes seven SIMA facilities,[86] and machine shop.	San Diego Bay
Outfall 9	A 12-inch diameter pipe west of dry dock 1. Drainage area includes four SIMA facilities and machine shop.	San Diego Bay
Outfall 11	24-inch diameter reinforced concrete pipe (RCP), near graving dock, west of Building 83. Drainage area includes three SIMA facilities and ship-to-shore utilities.	San Diego Bay
Outfall 14	30-inch diameter RCP west of Woden Street between Pier 6 and Pier 7. Drainage area includes warehouse and forklift and vehicle maintenance areas.	San Diego Bay
Outfall 22	18-inch diameter RCP east of Pier 7. Drainage area includes hazardous waste area.	San Diego Bay
Outfall 26	18-inch diameter RCP between Buildings 3322 and 68. Drainage area includes a formerly demolished industrial facility.	San Diego Bay
Outfall 30	18-inch diameter RCP between Cummings Road and Harbor Drive. Drainage area includes a diesel and gas fueling station.	Paleta Creek
Outfall 33	18-inch diameter RCP northeast of Building 197. Drainage area includes Pier #9 (Mole pier) with activities including sandblasting and painting.	San Diego Bay
Outfall 35	18-inch RCP west of 7th Street. Drainage area includes a roofing shop and areas with activities including sandblasting and painting.	San Diego Bay
Outfall 36	18-inch RCP at Paleta Creek Channel quay wall, north of Building 199.	Paleta Creek
Outfall 39	24-inch RCP at Pier 9 (Mole Pier) Drainage area includes activities including sandblasting and painting.	San Diego Bay

[86] SIMA facilities may include the following: Production Facility, Engine Shop, Machine/Welding Shop, two-Maintenance Shops, Auxiliary Machine shop, Machine shop, Maintenance, Auxiliary Machine, Transportation and Maintenance, and Maintenance, Sheet Metal Shop/Corrosion, Antenna Repair Shop.

Industrial Storm Water Outfall	Location Description	Receiving Water
Outfall 45	18-inch diameter RCP, northwest of Building 335, between Pier 9 and Pier 10. Drainage area includes consolidated diver's unit and hazardous material reutilization area	San Diego Bay
Outfall 46	18-inch diameter RCP adjacent to Pier #10, southeast of 10th Street. Drainage area includes garbage cooker area, truck wash and storage yard, crane, rigging and construction area, shop storage, and shop stores.	San Diego Bay
Outfall 71	Swale at curb, northwest corner of 32nd Street and Norman Scott Road intersection. Drains directly into Chollas Creek. Drainage area includes Navy exchange, gasoline station and auto care center.	Chollas Creek
Outfall 78	30-inch diameter RCP at Paleta Creek, just east of SD Trolley bridge. Drainage area includes auto hobby shop and carports, Fleet Training Center and Fire Fighting School.	Paleta Creek
Outfall 80	42-inch diameter RCP at Paleta Creek just east of Atchinson Topeka and Santa Fe RR bridge. Drainage area includes garbage cooker area, truck wash and storage yard; diesel & gasoline fuel station; shop stores; recycling center; contractor storage site; crane and rigging area.	Paleta Creek
Outfall 99	12-inch diameter PVC pipe in Chollas Channel quay wall south of Building 185A. Drains directly into Chollas Creek. Drainage area includes former hazardous material storage facility (facility has been demolished).	Chollas Creek
Outfall 119	Two-foot wide asphalt/dirt swale, northwest corner of boat yard/storage area. Drainage area includes a scrap yard.	San Diego Bay
Outfalls 161-171	Pier 1—multiple discharge points. Pier #1 is located immediately adjacent to the area where Chollas Creek discharges into San Diego Bay. Drainage area includes Pier 1.	San Diego Bay
Outfalls 172-195	Pier 2—multiple discharge points. Drainage area includes Pier 2.	San Diego Bay
Outfalls 415-438	Pier 13—multiple discharge points. Drainage area includes Pier 13.	San Diego Bay

It is important to note that Outfall 71 and Outfall 99 discharge directly into Chollas Creek and that Outfalls 161 through 171 are located on Pier 1 which is immediately adjacent to the area where Chollas Creek discharges into San Diego Bay. Available U.S. Navy studies (Katz et al., 2003; Chadwick et al., 1999) indicate that pollutants from Chollas Creek outflows, and from NBSD in general (including resuspended sediment), can be conveyed to the Shipyard Sediment Site via storm water flows, tidal currents, and ship movements. (See Section 10.10 for a detailed discussion of these pollutant discharge pathways.)

10.8. U.S. Navy Discharges Associated with Current Operations

10.8.1. Storm Water Monitoring for General Industrial NPDES Requirements for Storm Water Discharges and NBSD NPDES Requirements

Since 1992, General Industrial Storm Water NPDES Requirements have included Discharge Prohibitions and Receiving Water Limitations that set a narrative limit on discharge pollutant concentrations with the intent to reduce or eliminate toxic chemical concentrations in marine water, marine life, and sediment.

While subject to regulation under the General Industrial Storm Water NPDES Requirements, NBSD discharged pollutants at levels that are elevated compared to levels established by the CTR for saltwater.[87] The U.S. EPA finalized the CTR on May 18, 2000. None of the numerical values in CTR were included as numerical effluent limitations in any of the General Industrial NPDES Requirements issued to NBSD before May 2000; however, they are included as a narrative receiving water limitation in the current NBSD NPDES Requirements issued in 2002.

The numerical values in CTR represent the latest, most up-to-date numerical thresholds for use in determining whether a chemical concentration in a water body is detrimental to its beneficial uses. By comparing CTR values with pollutant levels in historical discharges, the San Diego Water Board can determine which discharges may have contributed to toxic chemical concentrations in marine water, marine life, and sediment at the Shipyard Sediment Site in the past. Also, where there are historical discharges elevated above CTR values, there exists an *elevated probability* that those same discharges contributed to the present condition of pollution. To the extent that those historical, elevated discharges *did* cause toxic chemical concentrations in marine water, marine life, and sediment, and/or *did* contribute to the present condition of pollution at the Shipyard Sediment Site, there exists an NPDES requirement violation.

Monitoring reports submitted by NBSD during the years 1994 through 2005, pursuant to the General Industrial Storm Water NPDES Requirements and NBSD NPDES Requirements, indicate that elevated levels of several pollutants, including but not limited to copper and zinc, were present in storm water discharged from the NBSD facility to San Diego Bay. As an example of these pollutant discharges, specific discharge violations of copper and zinc are listed below.

10.8.1.1. Storm Water Monitoring for General Industrial NPDES Requirements for Storm Water Discharges

NBSD obtained coverage under the State Water Board's General Industrial Storm Water NPDES Requirements for the discharge of industrial storm water. Order No. 91-13-DWQ, NPDES Permit No. CAS000001 was in effect from November 4, 1992 to July 8, 1997. Order No. 97-03-DWQ, NPDES Permit No. CAS000001, was in effect from July 8, 1997 to November 13, 2002.

[87] The California Toxics Rule (CTR) was finalized by the U.S. EPA in the Federal Register (65 Fed. Register 31682-31719), adding Section 131.38 to Title 40 of the Code of Federal Regulations on May 18, 2000. The full text of the CTR is available at the following web address: http://www.epa.gov/OST/standards/ctrindex.html.

While not providing specific numerical effluent limitations for all possible chemicals, the San Diego Water Board did require that discharges from NBSD not cause a violation of the discharge prohibitions and receiving water limitations presented in Section 10.7, above. NPDES discharge monitoring data provided by NBSD from 1992 through 1997 and 1998 through 2002 indicate elevated levels of discharged pollutants, including but not limited to copper and zinc, when compared to levels established by the CTR for saltwater.

To the extent that NBSD's discharges were elevated above CTR criteria values and violated General Industrial Storm Water NPDES requirement discharge prohibitions and receiving water limitations by causing toxic chemical concentrations in marine water, marine life, and sediment, and/or contributed to the present condition of pollution at the Shipyard Sediment Site (via storm flows, tidal movements (see Section 10.10), the following specific discharges are a violation of narrative limits of Order No. 91-13-DWQ, NPDES Permit No. CAS000001, and Order No. 97-03-DWQ, NPDES Permit No. CAS000001, and are cited in Tables 10-8 and 10-9[88] below.

Table 10-8 Discharges above CTR Criteria Values Occurring from 1992 to 1997

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 17, 1994	Copper	0.092 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	0.16 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	0.088 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	0.97 mg/L	0.0031 mg/L	Section 10.6	Outfall 33	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	0.67 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

[88] On October 30, 2000, the U.S. EPA promulgated FR Vol. 65, No. 210, U.S. EPA Benchmark Values for pollutant discharge from industrial facilities. The U.S. EPA Benchmark Values for copper and zinc are 0.0636 mg/L and 0.117 mg/L, respectively. While the U.S. EPA Benchmark Values are not an enforceable numeric limit, they are used to indicate concentrations of concern and to alert the regulated discharger to take actions to lower the concentrations in its discharge. Some sample concentrations in this table, dated after October 30, 2000, exceed both CTR and U.S. EPA Benchmark Values for copper and zinc.

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 17, 1994	Copper	0.028 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	0.043 mg/L	0.0031 mg/L	Section 10.6	Outfall 99	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Copper	0.24 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	0.4 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	0.63 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	0.39 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	2.6 mg/L	0.081 mg/L	Section 10.6	Outfall 33	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	1.5 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	0.3 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 17, 1994	Zinc	1.0 mg/L	0.081 mg/L	Section 10.6	Outfall 99	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
February 17, 1994	Zinc	0.5 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 1994 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 1995	Copper	0.019 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 1995	Zinc	0.27 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Copper	0.0082 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Copper	0.028 mg/L	0.0031 mg/L	Section 10.6	Outfall 26	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Copper	0.16 mg/L	0.0031 mg/L	Section 10.6	Outfall 33	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Copper	0.16 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Copper	0.17 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Copper	0.046 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Copper	0.075 mg/L	0.0031 mg/L	Section 10.6	Outfall 71	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 5, 1995	Copper	0.012 mg/L	0.0031 mg/L	Section 10.6	Outfall 78	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Copper	0.09 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Zinc	0.14 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Zinc	0.21 mg/L	0.081 mg/L	Section 10.6	Outfall 26	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Zinc	0.5 mg/L	0.081 mg/L	Section 10.6	Outfall 33	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Zinc	0.41 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Zinc	0.32 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Zinc	0.77 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Zinc	0.37 mg/L	0.081 mg/L	Section 10.6	Outfall 71	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 5, 1995	Zinc	0.07 mg/L	0.081 mg/L	Section 10.6	Outfall 78	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 5, 1995	Zinc	0.24 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 11, 1995	Copper	0.014 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 11, 1995	Copper	0.034 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 11, 1995	Copper	0.032 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 11, 1995	Zinc	0.31 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 11, 1995	Zinc	0.15 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.049 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.061 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.0014 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.59 mg/L	0.0031 mg/L	Section 10.6	Outfall 33	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
April 18, 1995	Copper	0.57 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.2 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.16 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.028 mg/L	0.0031 mg/L	Section 10.6	Outfall 71	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.03 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.072 mg/L	0.0031 mg/L	Section 10.6	Outfall 99	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.11 mg/L	0.0031 mg/L	Section 10.6	Outfall 99	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.031 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.37 mg/L	0.0031 mg/L	Section 10.6	Outfall 419	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Copper	0.45 mg/L	0.0031 mg/L	Section 10.6	Outfall 429	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
April 18, 1995	Copper	0.066 mg/L	0.0031 mg/L	Section 10.6	Outfall 433	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Zinc	0.25 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Zinc	0.32 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Zinc	0.068 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Zinc	1.6 mg/L	0.081 mg/L	Section 10.6	Outfall 33	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Zinc	1.4 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Zinc	0.64 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Zinc	0.59 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Zinc	0.15 mg/L	0.081 mg/L	Section 10.6	Outfall 71	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Zinc	0.23 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
April 18, 1995	Zinc	0.4 mg/L	0.081 mg/L	Section 10.6	Outfall 99	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Zinc	0.29 mg/L	0.081 mg/L	Section 10.6	Outfall 99	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 18, 1995	Zinc	0.12 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 1995 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Copper	0.08 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Copper	0.254 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Copper	0.04 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Copper	0.096 mg/L	0.0031 mg/L	Section 10.6	Outfall 26	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Copper	0.138 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Copper	0.354 mg/L	0.0031 mg/L	Section 10.6	Outfall 33	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Copper	0.864 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
December 09, 1996	Copper	1.68 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Copper	0.142 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Copper	0.41 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Copper	0.173 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Copper	0.052 mg/L	0.0031 mg/L	Section 10.6	Outfall 429	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Zinc	0.43 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Zinc	0.984 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Zinc	0.17 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Zinc	0.858 mg/L	0.081 mg/L	Section 10.6	Outfall 26	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Zinc	0.52 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
December 09, 1996	Zinc	1.68 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Zinc	1.58 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Zinc	0.501 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Zinc	1.79 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
December 09, 1996	Zinc	0.523 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	0.0402 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	0.0378 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	0.0337 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	0.0239 mg/L	0.0031 mg/L	Section 10.6	Outfall 26	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	0.104 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
January 15, 1997	Copper	0.115 mg/L	0.0031 mg/L	Section 10.6	Outfall 33	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	1.02 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	1.29 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	0.262 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	0.0426 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	0.485 mg/L	0.0031 mg/L	Section 10.6	Outfall 78	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	0.28 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	0.324 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Copper	0.0754 mg/L	0.0031 mg/L	Section 10.6	Outfall 429	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Zinc	0.146 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
January 15, 1997	Zinc	0.233 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Zinc	0.173 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Zinc	0.178 mg/L	0.081 mg/L	Section 10.6	Outfall 26	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Zinc	0.323 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Zinc	1.41 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Zinc	2.82 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Zinc	0.743 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Zinc	0.134 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Zinc	0.134 mg/L	0.081 mg/L	Section 10.6	Outfall 78	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 15, 1997	Zinc	1.7 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
January 15, 1997	Zinc	0.741 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 1997	Copper	0.569 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 1997	Copper	0.0883 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 1997	Copper	0.0569 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 1997	Copper	0.4 mg/L	0.0031 mg/L	Section 10.6	Outfall 78	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 1997	Zinc	0.198 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 1997	Zinc	0.429 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 1997	Zinc	0.323 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 1997	Zinc	0.323 mg/L	0.081 mg/L	Section 10.6	Outfall 78	U.S. Navy 1997 Annual Report	Order No. 91-13-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

1. 40 CFR 131.38
2. Reference to Section 10.6 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 10.6.
3. The cited waste discharge requirement(s) can be found in Section 10.7 of this Technical Report.

Table 10-9 Discharges above CTR Criteria Values Occurring from 1998 to 2002

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
November 8, 1998	Copper	0.13 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.14 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.07 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.02 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.09 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.03 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.11 mg/L	0.0031 mg/L	Section 10.6	Outfall 33	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.86 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.41 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.18 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

November 8, 1998	Copper	0.08 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.05 mg/L	0.0031 mg/L	Section 10.6	Outfall 71	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.06 mg/L	0.0031 mg/L	Section 10.6	Outfall 78	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.10 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.56 mg/L	0.0031 mg/L	Section 10.6	Outfall 99	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Copper	0.11 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	1.01 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	0.45 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	0.81 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	0.34 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	1.16 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

November 8, 1998	Zinc	1.12 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	0.47 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	0.48 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	0.46 mg/L	0.081 mg/L	Section 10.6	Outfall 71	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	0.74 mg/L	0.081 mg/L	Section 10.6	Outfall 78	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	0.64 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	0.75 mg/L	0.081 mg/L	Section 10.6	Outfall 99	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 8, 1998	Zinc	0.23 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.075 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.05 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.072 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

February 4, 1999	Copper	0.03 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.05 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.05 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.06 mg/L	0.0031 mg/L	Section 10.6	Outfall 33	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.30 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.95 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.068 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.055 mg/L	0.0031 mg/L	Section 10.6	Outfall 71	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.033 mg/L	0.0031 mg/L	Section 10.6	Outfall 78	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.122 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Copper	0.28 mg/L	0.0031 mg/L	Section 10.6	Outfall 99	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

February 4, 1999	Zinc	0.29 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Zinc	0.19 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Zinc	0.72 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Zinc	0.43 mg/L	0.081 mg/L	Section 10.6	Outfall 26	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Zinc	0.33 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Zinc	0.70 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Zinc	1.97 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Zinc	0.266 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Zinc	0.107 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Zinc	0.28 mg/L	0.081 mg/L	Section 10.6	Outfall 71	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Zinc	0.3 mg/L	0.081 mg/L	Section 10.6	Outfall 78	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

February 4, 1999	Zinc	0.4 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 4, 1999	Zinc	0.36 mg/L	0.081 mg/L	Section 10.6	Outfall 99	U.S. Navy 1998-1999 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Copper	0.123 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Copper	0.0716 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Copper	0.0962 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Copper	0.185 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Copper	0.186 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Copper	0.290 mg/L	0.0031 mg/L	Section 10.6	Outfall 33	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Copper	0.551 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Copper	0.927 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Copper	0.0688 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

February 10, 2000	Copper	0.123 mg/L	0.0031 mg/L	Section 10.6	Outfall 71	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Copper	0.107 mg/L	0.0031 mg/L	Section 10.6	Outfall 78	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Copper	0.182 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Zinc	0.925 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Zinc	0.501 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Zinc	1.27 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Zinc	0.511 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Zinc	1.23 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Zinc	1.06 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Zinc	0.306 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Zinc	0.861 mg/L	0.081 mg/L	Section 10.6	Outfall 71	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

February 10, 2000	Zinc	0.146 mg/L	0.081 mg/L	Section 10.6	Outfall 78	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 10, 2000	Zinc	0.762 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 12, 2000	Copper	0.0201 mg/L	0.0031 mg/L	Section 10.6	Outfall 26	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 12, 2000	Copper	0.0088 mg/L	0.0031 mg/L	Section 10.6	Outfall 99	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 12, 2000	Copper	0.0909 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 12, 2000	Zinc	0.631 mg/L	0.081 mg/L	Section 10.6	Outfall 26	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 12, 2000	Zinc	0.021 mg/L	0.081 mg/L	Section 10.6	Outfall 99	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 12, 2000	Zinc	0.577 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
February 20, 2000	Copper	0.118 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.0363 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.0279 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

April 17, 2000	Copper	0.0189 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.0527 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.0603 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.0778 mg/L	0.0031 mg/L	Section 10.6	Outfall 33	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.314 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.17 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.0696 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.0398 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.0291 mg/L	0.0031 mg/L	Section 10.6	Outfall 71	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.0762 mg/L	0.0031 mg/L	Section 10.6	Outfall 78	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.0371 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

April 17, 2000	Copper	0.0591 mg/L	0.0031 mg/L	Section 10.6	Outfall 99	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Copper	0.0419 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Zinc	0.278 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Zinc	0.412 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Zinc	0.123 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Zinc	0.14 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Zinc	0.189 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Zinc	0.096 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Zinc	0.163 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Zinc	0.119 mg/L	0.081 mg/L	Section 10.6	Outfall 71	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Zinc	0.295 mg/L	0.081 mg/L	Section 10.6	Outfall 78	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

April 17, 2000	Zinc	0.168 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Zinc	0.216 mg/L	0.081 mg/L	Section 10.6	Outfall 99	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 17, 2000	Zinc	0.191 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 21, 2000	Copper	0.0085 mg/L	0.0031 mg/L	Section 10.6	Outfall 26	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 21, 2000	Zinc	0.0154 mg/L	0.081 mg/L	Section 10.6	Outfall 26	U.S. Navy 1999-2000 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.38 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.0218 mg/L	0.0031 mg/L	Section 10.6	Outfall 26	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.163 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.243 mg/L	0.0031 mg/L	Section 10.6	Outfall 33	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.413 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	1.18 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

October 27, 2000	Copper	0.261 mg/L	0.0031 mg/L	Section 10.6	Outfall 39	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.125 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.0704 mg/L	0.0031 mg/L	Section 10.6	Outfall 71	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.0591 mg/L	0.0031 mg/L	Section 10.6	Outfall 78	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.138 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.125 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.0801 mg/L	0.0031 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.117 mg/L	0.0031 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Copper	0.32 mg/L	0.0031 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	2.34 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	0.456 mg/L	0.081 mg/L	Section 10.6	Outfall 26	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

October 27, 2000	Zinc	0.863 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	1.85 mg/L	0.081 mg/L	Section 10.6	Outfall 33	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	1.55 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	2.15 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	1.96 mg/L	0.081 mg/L	Section 10.6	Outfall 39	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	0.504 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	0.402 mg/L	0.081 mg/L	Section 10.6	Outfall 71	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	0.608 mg/L	0.081 mg/L	Section 10.6	Outfall 78	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	0.669 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	0.504 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	0.233 mg/L	0.081 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

October 27, 2000	Zinc	0.410 mg/L	0.081 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
October 27, 2000	Zinc	1.79 mg/L	0.081 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.193 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.139 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.118 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.143 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.646 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.117 mg/L	0.0031 mg/L	Section 10.6	Outfall 26	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.255 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.266 mg/L	0.0031 mg/L	Section 10.6	Outfall 33	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.282 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

January 8, 2001	Copper	0.119 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.19 mg/L	0.0031 mg/L	Section 10.6	Outfall 78	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	1.67 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.235 mg/L	0.0031 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.184 mg/L	0.0031 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Copper	0.234 mg/L	0.0031 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	0.561 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	0.695 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	0.283 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	1.49 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	2.91 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

January 8, 2001	Zinc	1.55 mg/L	0.081 mg/L	Section 10.6	Outfall 26	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	0.697 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	0.51 mg/L	0.081 mg/L	Section 10.6	Outfall 33	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	0.856 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	0.274 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	0.449 mg/L	0.081 mg/L	Section 10.6	Outfall 78	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	7.83 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	1.04 mg/L	0.081 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	0.422 mg/L	0.081 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 8, 2001	Zinc	0.642 mg/L	0.081 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Copper	0.0461 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

January 24, 2001	Copper	0.0555 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Copper	0.0742 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Copper	0.0742 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Copper	0.293 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Copper	0.881 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Copper	0.121 mg/L	0.0031 mg/L	Section 10.6	Outfall 39	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Copper	0.0999 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Copper	0.134 mg/L	0.0031 mg/L	Section 10.6	Outfall 71	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Copper	0.282 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Zinc	0.249 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Zinc	0.356 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

January 24, 2001	Zinc	0.316 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Zinc	1.06 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Zinc	1.17 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Zinc	2.06 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Zinc	0.675 mg/L	0.081 mg/L	Section 10.6	Outfall 39	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Zinc	0.451 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Zinc	0.629 mg/L	0.081 mg/L	Section 10.6	Outfall 71	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
January 24, 2001	Zinc	0.856 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 2000-2001 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.0844 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.0816 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.0537 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

November 24, 2001	Copper	0.287 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.0177 mg/L	0.0031 mg/L	Section 10.6	Outfall 24	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.047 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.0803 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.0857 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.0641 mg/L	0.0031 mg/L	Section 10.6	Outfall 39	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.0569 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.0479 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.113 mg/L	0.0031 mg/L	Section 10.6	Outfall 71	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.124 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.0795 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

November 24, 2001	Copper	0.0398 mg/L	0.0031 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.0808 mg/L	0.0031 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Copper	0.151 mg/L	0.0031 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.553 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.639 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.813 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	1.27 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.14 mg/L	0.081 mg/L	Section 10.6	Outfall 24	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.194 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.2 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.0776 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

November 24, 2001	Zinc	0.423 mg/L	0.081 mg/L	Section 10.6	Outfall 39	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.278 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.320 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.578 mg/L	0.081 mg/L	Section 10.6	Outfall 71	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.622 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.134 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.0807 mg/L	0.081 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.816 mg/L	0.081 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 24, 2001	Zinc	0.478 mg/L	0.081 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 29, 2001	Copper	0.0566 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 29, 2001	Copper	0.0569 mg/L	0.0031 mg/L	Section 10.6	Outfall 78	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

November 29, 2001	Zinc	0.809 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
November 29, 2001	Zinc	0.453 mg/L	0.081 mg/L	Section 10.6	Outfall 78	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 7, 2002	Copper	0.209 mg/L	0.0031 mg/L	Section 10.6	Outfall 71	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 7, 2002	Copper	0.310 mg/L	0.0031 mg/L	Section 10.6	Outfall 78	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 7, 2002	Zinc	1.41 mg/L	0.081 mg/L	Section 10.6	Outfall 71	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
March 7, 2002	Zinc	2.33 mg/L	0.081 mg/L	Section 10.6	Outfall 78	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.234 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.117 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.206 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.299 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.0283 mg/L	0.0031 mg/L	Section 10.6	Outfall 24	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

April 24, 2002	Copper	0.166 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.454 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.604 mg/L	0.0031 mg/L	Section 10.6	Outfall 36	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.552 mg/L	0.0031 mg/L	Section 10.6	Outfall 39	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.289 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.145 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.2 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.0685 mg/L	0.0031 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.0628 mg/L	0.0031 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Copper	0.195 mg/L	0.0031 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	1.23 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

April 24, 2002	Zinc	2.95 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	3.7 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	1.48 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	0.175 mg/L	0.081 mg/L	Section 10.6	Outfall 24	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	1.03 mg/L	0.081 mg/L	Section 10.6	Outfall 33	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	0.877 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	0.755 mg/L	0.081 mg/L	Section 10.6	Outfall 36	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	3.04 mg/L	0.081 mg/L	Section 10.6	Outfall 39	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	1.51 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	0.704 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	1.49 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

April 24, 2002	Zinc	0.202 mg/L	0.081 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	0.332 mg/L	0.081 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1
April 24, 2002	Zinc	0.47 mg/L	0.081 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2001-2002 Annual Report	Order No. 97-03-DWQ, A. Discharge Prohibitions 3 and B. Receiving Water Limitations 1

1. 40 CFR 131.38
2. Reference to Section 10.6 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 10.6.
3. The cited waste discharge requirement(s) can be found in Section 10.7 of this Technical Report.

10.8.1.2. Storm Water Monitoring for NBSD, Naval Base San Diego NPDES Requirements

The Naval Base San Diego (NBSD) NPDES Requirements regulate point source discharges from NBSD and three other San Diego naval installations[89] in San Diego. Order No. R9-2002-0169, NPDES Permit No. CA0109169, is in effect from November 13, 2002 to the present.

While not providing specific numerical effluent limitations for all possible chemicals, the San Diego Water Board did require that discharges from NBSD not cause a violation of the above discharge prohibitions and receiving water limitations, which specifically referred to the CTR. NPDES discharge monitoring data provided by NBSD in 2003 through 2005 indicate elevated levels of discharged pollutants, including but not limited to copper and zinc, when compared to levels established by the CTR for saltwater.

To the extent that NBSD's discharges were elevated above the CTR criteria values and violated NBSD NPDES requirement discharge prohibitions and receiving water limitations by causing toxic chemical concentrations in marine water, marine life, and sediment, and/or contributed to the present condition of pollution at the Shipyard Sediment Site via storm flows, tidal movements, or other transport mechanisms (please see Section 10.10), the following specific discharges are a violation of narrative limits of Order No. R9-2002-0169, NPDES Permit No. CA0109169, and are cited in Table 10-10[90] below.

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[89] The Naval Base San Diego (NBSD) Complex includes four installations: (1) Naval Station, San Diego (NAVSTA); (2) Mission Gorge Recreational Facility (MGRF); (3) Broadway Complex; and (4) Naval Medical Center, San Diego (NMCSD).

[90] On October 30, 2000, the U.S. EPA promulgated FR Vol. 65, No. 210, U.S. EPA Benchmark Values for pollutant discharge from industrial facilities. The U.S. EPA Benchmark Values for copper and zinc are 0.0636

Table 10-10 Discharges above CTR Values Occurring from 2003 to 2005

Date	Constituent	Concentration	CTR Saltwater Criteria (Continuous Concentration)[1]	Technical Report Reference[2]	Discharge Source	Source	Citation[3]
March 15, 2003	Copper	0.150 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.091 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.014 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.012 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.19 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.15 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.11 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

mg/L and 0.117 mg/L, respectively. While the U.S. EPA Benchmark Values are not an enforceable numeric limit, they are used to indicate concentrations of concern and to alert the regulated discharger to take actions to lower the concentrations in its discharge. Some sample concentrations in this table, dated after October 30, 2000, exceed both CTR and U.S. EPA Benchmark Values for copper and zinc.

March 15, 2003	Copper	0.48 mg/L	0.0031 mg/L	Section 10.6	Outfall 39	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.28 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.042 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.12 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.072 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.13 mg/L	0.0031 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.11 mg/L	0.0031 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Copper	0.46 mg/L	0.0031 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	0.330 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

March 15, 2003	Zinc	0.34 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	0.086 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	0.1 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	1.1 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	0.5 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	0.18 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	2.6 mg/L	0.081 mg/L	Section 10.6	Outfall 39	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	0.49 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	0.1 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

March 15, 2003	Zinc	0.45 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	0.2 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	0.36 mg/L	0.081 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	0.45 mg/L	0.081 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 15, 2003	Zinc	0.95 mg/L	0.081 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2002-2003 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Copper	0.083 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Copper	0.029 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Copper	0.064 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Copper	0.032 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

February 18, 2004	Copper	0.067 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Copper	0.1 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Copper	0.057 mg/L	0.0031 mg/L	Section 10.6	Outfall 39	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Copper	0.047 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Copper	0.047 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Copper	0.11 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Copper	0.082 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Copper	0.12 mg/L	0.0031 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Zinc	0.38 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

February 18, 2004	Zinc	0.16 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Zinc	0.42 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Zinc	0.55 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Zinc	0.29 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Zinc	0.25 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Zinc	0.28 mg/L	0.081 mg/L	Section 10.6	Outfall 39	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Zinc	0.47 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Zinc	0.3 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Zinc	0.47 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

February 18, 2004	Zinc	0.24 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 18, 2004	Zinc	0.36 mg/L	0.081 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 1, 2004	Copper	0.05 mg/L	0.0031 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 1, 2004	Copper	0.046 mg/L	0.0031 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 1, 2004	Zinc	0.45 mg/L	0.081 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 1, 2004	Zinc	0.17 mg/L	0.081 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.11 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.210 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.12 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

April 17, 2004	Copper	0.092 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.11 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.27 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.19 mg/L	0.0031 mg/L	Section 10.6	Outfall 39	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.12 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.056 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.16 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.17 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.26 mg/L	0.0031 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

April 17, 2004	Copper	0.065 mg/L	0.0031 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Copper	0.093 mg/L	0.0031 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	0.69 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	4.2 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	0.7 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	1.2 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	1.3 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	0.6 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	1.3 mg/L	0.081 mg/L	Section 10.6	Outfall 39	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

April 17, 2004	Zinc	0.99 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	0.42 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	0.81 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	0.33 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	0.72 mg/L	0.081 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	0.51 mg/L	0.081 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
April 17, 2004	Zinc	0.34 mg/L	0.081 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2003-2004 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.039 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.056 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

January 28, 2005	Copper	0.0084 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.011 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.026 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.029 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.055 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.16 mg/L	0.0031 mg/L	Section 10.6	Outfall 39	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.027 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.03 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.099 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

January 28, 2005	Copper	0.049 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.062 mg/L	0.0031 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.03 mg/L	0.0031 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Copper	0.14 mg/L	0.0031 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.21 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.43 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.032 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.045 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.21 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

January 28, 2005	Zinc	0.098 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.16 mg/L	0.081 mg/L	Section 10.6	Outfall 35	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.56 mg/L	0.081 mg/L	Section 10.6	Outfall 39	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.16 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.2 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.49 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.13 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	2.2 mg/L	0.081 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
January 28, 2005	Zinc	0.28 mg/L	0.081 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

January 28, 2005	Zinc	0.68 mg/L	0.081 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Copper	0.018 mg/L	0.0031 mg/L	Section 10.6	Outfall 22	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Copper	0.037 mg/L	0.0031 mg/L	Section 10.6	Outfall 30	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Copper	0.12 mg/L	0.0031 mg/L	Section 10.6	Outfall 35	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Copper	0.028 mg/L	0.0031 mg/L	Section 10.6	Outfall 39	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Copper	0.029 mg/L	0.0031 mg/L	Section 10.6	Outfall 46	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Copper	0.07 mg/L	0.0031 mg/L	Section 10.6	Outfall 80	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Copper	0.05 mg/L	0.0031 mg/L	Section 10.6	Outfall 119	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Copper	0.039 mg/L	0.0031 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

February 10, 2005	Copper	0.2 mg/L	0.0031 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Zinc	0.56 mg/L	0.081 mg/L	Section 10.6	Outfall 22	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Zinc	0.27 mg/L	0.081 mg/L	Section 10.6	Outfall 30	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Zinc	0.4 mg/L	0.081 mg/L	Section 10.6	Outfall 35	2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Zinc	0.18 mg/L	0.081 mg/L	Section 10.6	Outfall 39	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Zinc	0.15 mg/L	0.081 mg/L	Section 10.6	Outfall 46	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Zinc	0.23 mg/L	0.081 mg/L	Section 10.6	Outfall 80	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Zinc	0.15 mg/L	0.081 mg/L	Section 10.6	Outfall 119	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 10, 2005	Zinc	1.5 mg/L	0.081 mg/L	Section 10.6	Outfall 167-171	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

February 10, 2005	Zinc	1.4 mg/L	0.081 mg/L	Section 10.6	Outfall 415-438	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 11, 2005	Copper	0.016 mg/L	0.0031 mg/L	Section 10.6	Outfall 14	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 11, 2005	Copper	0.044 mg/L	0.0031 mg/L	Section 10.6	Outfall 45	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 11, 2005	Copper	0.032 mg/L	0.0031 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 11, 2005	Zinc	0.16 mg/L	0.081 mg/L	Section 10.6	Outfall 14	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 11, 2005	Zinc	0.13 mg/L	0.081 mg/L	Section 10.6	Outfall 45	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
February 11, 2005	Zinc	0.3 mg/L	0.081 mg/L	Section 10.6	Outfall 172-195	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 4, 2005	Copper	0.072 mg/L	0.0031 mg/L	Section 10.6	Outfall 5	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 4, 2005	Copper	0.05 mg/L	0.0031 mg/L	Section 10.6	Outfall 9	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

March 4, 2005	Copper	0.08 mg/L	0.0031 mg/L	Section 10.6	Outfall 11	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 4, 2005	Zinc	0.32 mg/L	0.081 mg/L	Section 10.6	Outfall 5	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 4, 2005	Zinc	0.52 mg/L	0.081 mg/L	Section 10.6	Outfall 9	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2
March 4, 2005	Zinc	0.34 mg/L	0.081 mg/L	Section 10.6	Outfall 11	U.S. Navy 2004-2005 Annual Report	Order No. R9-2002-0169, A. Prohibitions 5, B Discharge Specifications 1, C. Receiving Water Limitations 1 and 2

1. 40 CFR 131.38
2. Reference to Section 10.6 indicates discharging or depositing waste where it will be discharged into San Diego Bay creating, or threatening to create a condition of pollution, contamination, and nuisance. See Section 10.6.
3. The cited waste discharge requirement(s) can be found in Section 10.7 of this Technical Report.

10.8.2. NBSD Storm Water and Other Discharges to Chollas Creek[91]

Chollas Creek drains a total of approximately 16,273 acres of land. The area of NBSD draining to Chollas Creek is approximately 266 acres. Table 10-11 provides a statistical summary of U.S. Navy monitoring of U.S. Navy owned storm water outfalls discharging into Chollas Creek between the years 1994 through 2000. The data in Table 10-11 indicates that elevated levels of copper, lead, and zinc were almost always detected in the U.S. Navy's Chollas Creek storm water discharges between the years 1994 through 2000. Zinc was detected on all occasions while copper was detected 94 percent of the time and lead 91 percent of the time. Cadmium, chromium and nickel were also detected approximately 65 percent of the time.

Table 10-11 Statistical Summary of U.S. Navy Storm Water Monitoring for Chollas Creek Storm Drain Outfalls (1994 through 2000)

Parameter Total Metal	Geometric Mean Concentration (mg/L)	Arithmetic Mean Concentration (mg/L)	Number of Records (n=)	Standard Deviation	Range (mg/L)	Sample Dates	Number of Non-Detects	Method Detection Ranges (mg/L)

[91] Unless otherwise explicitly stated, the data and technical information contained in this section were obtained from the U.S. Navy August 2000 Report, *Toxic Hot Spot Assessment Study at Chollas Creek and Paleta Creek, Historical Data Review*. (U.S. Navy 2000)

Arsenic	4.3	4.8	25	3	3 – 10	1994 - 1997	25	3 – 10
Cadmium	0.8	1.2	38	1	0.2 – 3.7	1994 - 1997	13	0.2 – 1.0
Chromium	8.8	13.1	41	10	1.3 – 50	1994 - 1999	13	1.5 – 20
Copper	**88.0**	**166.3**	**54**	**239**	**8.8 – 1,080**	**1994 - 2000**	**3**	**5 – 10**
Lead	**15.7**	**29.6**	**44**	**30**	**2 – 110**	**1994 - 2000**	**4**	**2.0 – 20**
Mercury	0.4	0.4	25	0.1	0.2 – 0.4	1994 - 1997	25	0.2 – 0.5
Nickel	18.4	23.7	32	16	4.8 – 63	1994 - 1997	11	5 – 40
Selenium	4.6	5.0	25	3	4 – 21	1994 - 1997	24	4 – 5
Silver	6.7	8.4	26	3	0.2 – 10	1994 - 1997	26	0.2 – 10
Zinc	**386**	**708**	**48**	**946**	**21 – 4,880**	**1994 - 2000**	**0**	**Unknown**

(U.S. Navy, 2000)

Leaching from U.S. Navy ship hull antifouling paint and cathodic protection systems provide continuing sources of copper and zinc to San Diego Bay waters at the mouth of Chollas Creek. The U.S. Navy has estimated loading rates from service craft and active military vessels typically moored in or near Chollas Creek waters, in an area bounded by Chollas Creek mooring locations and the south side of Pier 1. At the time of the study in 2000, seven commercial tugs and six U.S. Navy barges were typically berthed in Chollas Creek waters. One vessel, the USNS Mercy, was berthed for prolonged periods on the south side of Pier 1.[92] The U.S. Navy's copper and zinc loading estimates by vessel type are provided in Table 10-12. Total copper loading to the mouth of Chollas Creek area from ship hull antifouling paints was estimated at 220 kg/yr based on a conservative copper leach rate of 11 µg /cm^2/day.[93] Total zinc loading from leaching anodes associated with ship hull cathodic protection systems was estimated to be 508 kg/year using U.S. EPA estimated leach rates for the vessel types shown in Table 10-12 below.

Table 10-12 Estimated Copper and Zinc Loading from Service Craft and Active Military Vessels at Chollas Creek

Chollas Creek Service Craft	Number of Vessels	Copper Load (kg/yr)	Zinc Load (kg/yr)
Tiger FOSS commercial tug	1	9.9	22
Tractor commercial tug	6	59.4	132
Open Lighter YC1469 class (110x8x694)	6	101.4	354
USNS Mercy	1	49.0	-
Water Column Total (kg/yr):		**220**	**508**

Note: The values represent total loading to the water column. (U.S. Navy, 2000)

92 Berthing of larger naval vessels (e.g. cruisers or destroyers) may sometimes occur at Pier 1. The operational berthing of these vessels at Pier 1 was not determined at the time the US Navy prepared its loading estimates. (U.S. Navy, 2000)

93 Hull bottom leach rate determination is the subject of on-going research and can be influenced by paint age, cleaning frequency, water temperature and formation of surface algal film. As such the 11 ug /cm^2/day is a conservative estimate as there are some unpublished experimental data that suggest the true leach rate is likely lower. (U.S. Navy, 2000)

The U.S. Navy also estimated loading from U.S. Navy storm water outfalls and upstream urban storm water outfalls[94] to the mouth of Chollas Creek. The U.S. Navy's loading estimates for storm water and hull leachate are provided in Table 10-13 below.

[94] The upstream storm water outfalls are primarily owned and operated by the City of San Diego. The City of San Diego owns and operates approximately 816 MS4 storm drain outfalls, which convey urban runoff into Chollas Creek.

Table 10-13 Estimated Annual Contaminant Loading to the Chollas Creek Toxic Hot Spot Region with Storm Water Inputs Listed by U.S. Navy and Upstream Portions of the Chollas Creek Watershed

	Size Acres	Copper kg/yr	Lead kg/yr	Mercury kg/yr	Zinc kg/yr	PAH total kg/yr	PCB total kg/yr
NBSD Chollas Creek Storm Water	209	16	3	0	71	-	-
Upstream Chollas Creek Storm Water	16,064	186	139	0	1,526	-	58
Hull Leachate	n/a	110	n/a	n/a	259	n/a	n/a
Total	**16,273**	**312**	**142**	**0**	**1,856**	**-**	**58**

Notes: Simple method used to calculate loading. EMC data by land use category available for copper, lead, and zinc. All others used storm water averages reported in this document assuming annual rainfall of 10.2 inches (1960-2000 average rainfall at Lindbergh Field, San Diego).

Dash (-) represents data not available to calculate loading at this time, typically due to unavailability of monitoring data.

Underlined = Data below method detection limit (DL) so conservatively used average DL as estimate of concentration. This makes loading estimates highly subjective, at best.

(U.S. Navy, 2000)

The U.S. Navy's loading estimates in Table 10-13, above, indicate that storm water is an ongoing major contributor of copper, lead, and zinc to the mouth of Chollas Creek. The data suggests that that the primary loading of copper, lead, and zinc is from the urban upstream portion of the Chollas Creek watershed. U.S. Navy storm water outfalls were estimated to introduce 5% of the cooper, 2% of the lead and 4% of the zinc. However, leaching of copper from U.S. Navy ship hull coatings was estimated to be 35% of the copper load and leaching of zinc from U.S. Navy cathodic protection system anodes was estimated to be 14% of the load. In summary, the U.S. Navy's pollutant contributions to the mouth of Chollas Creek, including storm water discharges, hull leaching, and cathodic protection account for approximately 40% of the copper load, 2% of the lead load, and 18% of the zinc load.

10.8.3. NBSD Pier Pilings

The outcome of various U.S. Navy environmental studies in San Diego Bay during the early 1990s suggests that there was a substantial chronic source of PAHs to San Diego Bay and that the hydrocarbons were predominately derived from a pyrogenic heat-producing source (Chadwick et al., 1999). The studies concluded that creosote treated[95] pilings were potentially a significant source of PAHs discharges to San Diego Bay due to the large number of such pilings in the Bay at the time the studies were conducted. The flux of PAHs from in-place creosote pilings was determined to be 0.0022 to 0.0033 $g \cdot cm^{-2} \cdot yr$. The total number of creosote pilings in

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[95] At the time the studies were conducted, creosote was extensively used in the treatment of wood products exposed to the marine environment to minimize wood degradation.

San Diego Bay in 1995 was estimated by visual count at 13,600 pilings. Up until 1996, approximately 8,700 pilings (64%) were located mostly south of Coronado Bridge in the back bay, and of these, approximately 4,460 pilings were located in the vicinity of NBSD. Since 1996 approximately 50 percent of the pilings in the back bay have been replaced, leaving 2,230 in the vicinity of NBSD, 4,350 in the back bay as a whole, and 9,250 throughout the entire bay. Assuming a flux of 0.0022 to 0.0033 $g{\cdot}cm^{-2}{\cdot}yr$, Chadwick et al. (1999) determined the total historical contribution of PAHS to San Diego Bay prior to 1996 from creosote pilings to be 3.1 to 4.6 metric tons per year. The total "current" contribution of PAHS to San Diego Bay from the remaining creosote pilings in San Diego Bay in 2001 was estimated to be 2.1 to 3.1 metric tons per year. Since 1996, the U.S. Navy has been replacing creosote pier pilings at NBSD with plastic pilings and this effort is continuing.

10.9. Clean Water Act Section 303(d) Listed Impaired Waters Adjacent to NBSD

Data collected for the Bay Protection Toxic Cleanup Program (Fairey et al., 1996) were used to place portions of San Diego Bay on the CWA section 303(d) List. Three segments of the San Diego Bay shoreline adjacent to the NBSD were listed for sediment toxicity and benthic community degradation: Mouth of Chollas Creek, Mouth of Paleta Creek, and NBSD at 32nd Street. Historical and recent discharges from NBSD as well as other upstream urban sources in the Chollas Creek and Paleta Creek watersheds have contributed to pollutant levels found at these sites. The study, titled "Sediment Assessment Study for Mouths of Chollas and Paleta Creeks, San Diego, Phase I" (SCCWRP and U.S. Navy, 2005b) defined potential impairments for these two segments. In addition, the Shipyard Sediment Site is listed on the CWA section 303(d) List as San Diego Bay Shoreline, between Sampson and 28th Streets.[96]

10.9.1. Mouth of Chollas Creek

The location for the CWA 303(d) listing of San Diego Bay Shoreline at the mouth of Chollas Creek extends from the weir downstream of the Belt Street Bridge, bounded on the north by the NASSCO pier and to the south by the NBSD Pier 1, and extends to the end of the piers. The estimated total area is 15 acres.

The Phase I Study, (SCCWRP and U.S. Navy, 2005b) reported that PAHs, PCBs, chlordane, and DDT concentrations indicated potential impairment to aquatic life, while copper concentration was specified for bioaccumulation concern, and benzo [a] pyrene and PCB concentrations were indicated for human health risks. The TIE Study, titled "Sediment Toxicity Identification Evaluation for the Mouths of Chollas and Paleta Creeks, San Diego" (Greenstein et al., 2005), designated chlordane, PAHs, and non-polar organics (including PCBs) as probable causes of toxicity.

96 Final 2002 Clean Water Act Section 303(d) List of Water Quality Impaired Segments, approved by U.S. EPA in July 2003. http://www.waterboards.ca.gov/tmdl/docs/2002reg9303dlist.pdf

10.9.2. Mouth of Paleta Creek

The designated CWA 303(d) listing for San Diego Bay Shoreline at the mouth of Paleta Creek (7th Street Channel) extends from the outlet of Paleta Creek (downstream of the Harbor Drive Bridge and Cummings Road), bound by NBSD Pier 8 to the north and Pier 9 (mole pier) to the south, and extends to the end of the piers. The Phase I Study reports that PAHs, PCBs, chlordane, DDT, and lead concentrations indicate potential impairment to aquatic life, and similarly, benzo [a] pyrene and PCB concentrations indicated possible human health risks. The TIE Study report found that PAHs, chlordane, and non-polar organics (including PCBs) were probable causes of toxicity.

10.9.3. NBSD at 32nd Street

The designated CWA 303(d) listing for San Diego Bay Shoreline for NBSD at 32nd Street extends out from the shoreline, with northern and southern limits at Pier 1 (at the mouth of Chollas Creek) and Pier 8 (at the mouth of Paleta Creek), respectively.

Studies associated with TMDL development have not been generated at this point. However, the U.S. Navy has produced a report, titled "Sediment Quality Characterization Naval Station San Diego: Final Summary Report" (Chadwick et al., 1999) which addresses this area. The area between Piers 2 and 7 were classified as high-to-moderately impacted areas. Sediment concentrations exceeding the ERM for a specific contaminant were reported for silver, copper, mercury, zinc, and PCBs. Bioaccumulation data indicate that metals and PAHS were found to bioaccumulate at NBSD sites with mercury, copper, and zinc being "most notable." PCBs were not bioaccumulated.

10.10. Discharge Contributions to the Accumulation of Pollutants at the Shipyard Sediment Site

The U.S. Navy has caused or permitted discharges of pollutants from NBSD to San Diego Bay and has contributed to both the levels of pollutants, and the pollution and nuisance conditions, found at the Shipyard Sediment Site through the pollutant transport mechanisms described in the subsections below.

10.10.1. Chollas Creek Outflow

Chollas Creek consists of freshwater flow with elevated suspended solids containing significant chemical pollutants. Chollas Creek is currently listed on the CWA section 303(d) List of Water Quality Limited Segments (303(d) List) for impairment caused by copper, lead and zinc concentrations exceeding applicable numerical water quality criteria in the CTR.[97] San Diego

[97] See Regional Board Resolution No. R9-2005-0111, A Resolution Adopting An Amendment To The Water Quality Control Plan For The San Diego Region To Incorporate Total Maximum Daily Loads For Dissolved Copper, Lead, And Zinc in Chollas Creek, Tributary to San Diego Bay, June 29, 2005. See also Regional Board Technical Report, Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay, June 29, 2005.

Bay marine sediment at the mouth of Chollas Creek is also listed on the 303(d) List for sediment toxicity and degraded benthic community impairments. As discussed in Section 10.8.2, the U.S. Navy's discharges, including storm water discharges, hull leaching, and cathodic protection, account for approximately 40% of the copper load, 2% of the lead and 18% of the zinc load in Chollas Creek. The U.S. Navy's discharges into Chollas Creek therefore contribute to the pollutants discharged from Chollas Creek outflows into San Diego Bay. The mouth of Chollas Creek is immediately adjacent to the southern boundary of the Shipyard Sediment Site.

Urban runoff in Chollas Creek has been shown to be toxic to both saltwater and freshwater organisms. In-channel wet-weather monitoring from previous storm seasons showed that samples of Chollas Creek storm water were toxic to the water flea (*Ceriodaphnia dubia*), the fathead minnow (*Pimephales promelas*), and the purple sea urchin (*Strongylocentrotus purpuratus*). A study conducted by Southern California Coastal Research Project (SCCWRP) in 2001 to establish the linkage between the Chollas Creek in-channel toxicity measurements and potential impairments in the receiving water of San Diego Bay, (Schiff, 2003), concluded that:

- *Storm water plumes from Chollas Creek extended over an area of two km2 in San Diego Bay*. The study observed that storm water plumes emanating from Chollas Creek extended between 0.02 and 2.25 km2 over San Diego Bay during small to moderately-sized storm events. Plumes were easily distinguished using salinity as a conservative tracer of wet weather inputs. Turbidity was also a good tracer of the plume. Storm water plumes formed relatively thin lenses of 1 to 3 meters, floating on top of the more dense bay water.

- *Toxicity extended up to 1 km from the Creek mouth and was proportional to the amount of runoff dilution*. The SCCWRP study measured toxicity using the purple sea urchin (Strongylocentrotus purpuratus) fertilization test in both storm water samples taken from the creek and samples taken from the storm water plume in San Diego Bay. This toxicity varied across the gradient of plume influence and was well correlated with the amount of storm water present in the sample. All samples were salinity adjusted before toxicity testing, so the gradient in toxicity appears to be a function of toxicants present in the storm water discharges.

- *The toxic part of the plume was smaller than the salinity signal*. Although toxicity was measured in the storm water plume emanating from Chollas Creek, the entire plume was not toxic. In the two storms that were mapped from this study, the toxic portion of the plume was approximately 25 percent to 50 percent of the plumes' salinity signal. This reduction in the spatial extent of plume toxicity was likely due to dilution and mixing of the plume in the Bay.

- *In-channel and plume toxicity was primarily due to trace metals including zinc and copper*. TIEs conducted on storm water samples from both the Creek and from the storm water plume in the Bay identified dissolved trace metals, predominantly zinc, as the toxicant responsible for the majority of toxicity. Toxicity was eliminated by the addition of the metal chelating agent EDTA. Concentrations of dissolved zinc, and to a lesser extent copper, were high enough in the tested samples to account for the observed toxicity.

Additionally, available U.S. Navy studies (Katz et al., 2003; Chadwick et al., 1999) indicate that the Chollas Creek outflow (plume) to San Diego Bay can introduce pollutants to the Shipyard Sediment Site. The U.S. Navy funded a project in 2001 to quantify storm event mass loading of pollutants from upstream MS4 creek sources and from near-bay U.S. Navy sources as well as to characterize the spatial and temporal impacts from the plumes generated in the bay. Specific conclusions of the study by Katz et al. (2003) include:

- During a single storm event in February 2001, the sediment plume containing pollutants from Chollas Creek was measured to cover an area up to 1.2 km away from the mouth of Chollas Creek. (Although not a specific conclusion of Katz et al., 2003, the San Diego Water Board has inferred that this area would include a portion of BAE Systems' waterside leasehold, which is located approximately 1 km north of the mouth of Chollas Creek, and the entire NASSCO waterside leasehold, located directly adjacent to the Chollas Creek mouth.)

- Storm water plumes from Chollas Creek developed quickly after the start of rainfall and were dispersed through tidal mixing 12 hours after runoff ceased.

- Plume evolution in the bay was well tracked by all real-time measurement parameters though most clearly with salinity, light transmission, and oil fluorescence.

- Contaminants were primarily associated with particles and their strong association with total suspended solids (TSS) provides a good first order approximation for their distribution.

- Upstream storm water sources (i.e. sources upstream of U.S. Navy sources) dominate the loading of contaminants to the bay via Chollas Creek, with discharges from Naval Station property accounting for only an average of 5% of total contaminants.

- Storm water is a continuing source of excessive levels of lead, zinc, chlordane, DDT, and PCBs, and possibly Total PAH and mercury, to the sediment at the mouth of the Chollas Creek.

10.10.2. Tidal Transport of Sediment Resuspended by Ships

Marine sediment pollutant levels and distribution in San Diego Bay are generally consistent with source locations (i.e. marine sediment pollutant levels tend to decrease as a function of distance from source locations). However, there are physical, biological, biochemical, and chemical processes that alter marine sediment and pollutants over time, irrespective of proximity to source locations. In San Diego Bay these processes may include dredging, boat tugging and docking of large vessels, tidal or wind driven currents, bioturbation,[98] biological uptake, and dissolution or chemical reactions.

The redistribution of contaminated marine sediment from NBSD to other areas of San Diego Bay can be caused by both ship movements and natural processes in which marine sediment is resuspended into the water column and redistributed by bay currents. Ship movement resuspension of marine sediment occurs as a result of shear forces generated by the thrust of propellers during boat tugging and docking of large naval vessels. Natural resuspension of marine sediment is caused by the shear forces induced by bay currents and wind induced wave action. The majority of sediment resuspension at NBSD is caused by ship movement.[99] Polluted sediment resuspension and transport by tidal currents is a pathway for pollutants from NBSD to migrate to the Shipyard Sediment Site.

10.10.2.1. Sediment Resuspension by Ships

Ship movements and the associated tug boat activity at NBSD resuspends and redistributes marine sediment and its associated pollutants in San Diego Bay. The U.S. Navy has estimated the loading of sediment in San Diego Bay from NBSD due to resuspension of sediment by ship movements and concluded that this is a significant source of sediment loading to the bay (Chadwick et al., 1999).

The U.S. Navy used their records of ship movement frequency and considered movements away from the piers into the main channel as well as the reverse docking movements. Their analysis also took into account the number of tug boats used. The survey of ship movements at NBSD indicated just less than an average of five ship movements per day with one to two tugs per ship for a total of 1730 ship movements per year.[100] Field measurements of total suspended sediment (TSS) were taken before and after ship movements. The calculations also included subtracting background TSS concentrations.

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[98] "Bioturbation" refers to the turning and mixing of sediments particles by benthic fauna (animals) or flora (plants). The sediment-water interface increases in area as a result of bioturbation, affecting chemical fluxes and thus exchange between the sediment and water column.

[99] U.S. Navy studies indicate sediment resuspension at NBSD is caused to a much lesser extent by currents and wind waves. San Diego Bay has very mild bottom shear stresses and mild bottom erosion. Under typical conditions the minimum bottom shear needed for the movement of fine bottom sediments is about 1.0 dynes-cm^{-2}. In the pier areas and shipping channel, the average bottom shear stress does not exceed 0.25 dynes-cm^{-2} (Chadwick et al., 1999).

[100] The ship movements considered were for tug assisted movements (launching/docking) of larger ships with drafts greater than about 22 feet. The movements considered were for launching movements away from the piers into the main channel, the initial acceleration in the main channel until underway, and for docking, i.e., the reverse of this process (Chadwick et al., 1999).

The U.S. Navy estimated that, from 16,700 to 71,400 kilograms per day (kg/day), an average of 41,700 kg/day, of sediment is resuspended due to ship movements in the NBSD pier area. For comparison purposes, the U.S. Navy reported that (Chadwick et al., 1999):

> *"This daily input represents 29 percent of the background mass of suspended sediment for NAVSTA and adjacent shipping channel. In comparison to TSS loading from Chollas and Paleta Creeks, which drain into NAVSTA, the yearly estimated total sediment resuspension from tug-assisted ship movements was roughly 300 percent of the storm estimated total mass coming from the creeks."*

10.10.2.2. Sediment Transport from Naval Station San Diego

The U.S. Navy utilized a hydrodynamic model (TRIM-2D) and a sediment transport model (TRIM-SED) to evaluate the transport of resuspended sediment and associated chemicals in the vicinity of NBSD (Chadwick et al., 1999). The study showed that the majority of resuspended clay (77.5%) and silt (66.4%) sized sediment is transported from the pier area and deposited outside the pier area. Lesser percentages of the fine sand (31.7%) and coarse sand (10.6%) are also transported and deposited outside of the piers. The modeling concludes that overall, approximately 55% of the sediment resuspended from within the piers is deposited outside the piers.

The models were also used to simulate the footprint of suspended sediment and chemical levels that have settled on the bay bottom during and after storm events. The model results show that fine TSS particles (less than 12 microns) extend throughout the bay. Particles sized from 12 to 55 microns are also transported to the front and back sections of the bay but are localized along the eastern shoreline. Medium sized particles settle within 1 to 2 km of the creek outfalls, and the course particles settle right at the outfalls (Chadwick et al., 1999). The model considered only tidal currents as the transport mechanism, not ship movements and associated tugboat activity. Although the simulated footprint of deposition of the suspended sediment was to evaluate inputs from the creeks (e.g. Chollas Creek) during storm events, it is reasonable to assume that the tidal currents and movements would also similarly redistribute and deposit sediment resuspended by ship movements in the pier area. Therefore, it is concluded that tidal movements have resulted in resuspended sediment from NBSD being deposited at the Shipyard Sediment Site.

10.10.3. 28th Street Shore Boat Landing Station

As previously described in Section 10.4.2, between the years 1938 and 1956 the U.S. Navy occupied a parcel of land at the south end of the current NASSCO leasehold at the foot of 28th Street, including the 28th Street Pier. This parcel was originally leased from the City of San Diego and was referred to as the 28th Street Shore Boat Landing Station.

The U.S. Navy activities on the north side of the 28th Street Pier included operation of a machine shop, battery shop, planing mill, electric shop, mold loft, mill work office, naval stores, pipe shop, pipe threading area, overhead crane, and boat way. The facilities were used for naval vessel repair 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. Painting and scraping operations generate wastes that can be conveyed by water flows, become airborne (especially during dry blasting), or fall directly into receiving waters. The types of pollutants found in elevated concentrations at the Shipyard Sediment Site (metals, butyltin species, PCBs, PCTs, PAHs, and TPH) are associated with the characteristics of the waste the U.S. Navy operations generated at the NASSCO site.

11. Finding 11: San Diego Unified Port District

Finding 11 of CAO No. ~~R9-2011-0001~~R9-2012-0024 states:

The San Diego Water Board ~~alleges, but the Port District denies,~~ finds that the Port District caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. The Port District is a special government entity, created in 1962 by the San Diego Unified Port District Act, California Harbors and Navigation Code Appendix I, in order to manage San Diego Harbor, and administer certain public lands along San Diego Bay. The Port District holds and manages as trust property on behalf of the People of the State of California the land occupied by NASSCO, BAE Systems, and the cooling water tunnels for SDG&E's former Silver Gate Power Plant. The Port District is also the trustee of the land formerly occupied by ~~the Star & Crescent Boat~~ San Diego Marine Construction Company and ~~its predecessor, and~~ by Campbell ~~Industries~~ at all times since 1963 during which they conducted shipbuilding and repair activities.[101] The Port District's own ordinances, which date back to 1963, prohibit the deposit or discharge of any chemicals or waste to the tidelands or San Diego Bay and make it unlawful to discharge pollutants in non-storm water directly or indirectly into the storm water conveyance system. ~~The San Diego Water Board has the discretion to name the Port District in its capacity as the State's trustee as a "discharger" in the Shipyard Sediment Site CAO and hereby does so, consistent with its responsibility for the actions, omissions and operations of its tenants and to the extent indicated by previous State Water Board and San Diego Water Board orders~~

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

The San Diego water Board has discretion to name the Port district in its capacity as the State's trustee as a "discharger" in the Shipyard Sediment Site CAO and hereby does so in this CAO, consistent with its responsibility for the actions, omissions and operations of its tenants and to the extent indicated by previous State Water Board and San Diego Water Board orders. The Port District asserts that its status as a lessor and the State's trustee as well as other factors should only give rise to secondary and not primary liability as a discharger under this Order. Allocation of responsibility has not been determined and there is insufficient evidence to establish that present and former Port District tenants at the Site each have sufficient financial resources to perform all of the remedial activities required by this CAO. In addition, cleanup is not underway at this time. Under those circumstances, it is not appropriate to accord the Port District the secondary liability status it seeks.

The Port District also owns and operates a municipal separate storm sewer system (MS4) through which it discharges waste commonly found in urban runoff to San Diego Bay subject to

[101] ~~Star & Crescent Boat~~San Diego Marine Construction Company and Campbell Industries owned and operated ship repair and construction facilities in past years prior to BAE Systems San Diego Ship Repair, Inc.'s occupation of the leasehold. See Sections 5 and 6 of the Technical Report.

the terms and conditions of an ~~National Pollutant Discharge Elimination System (~~NPDES~~)~~ Storm Water Permit. The San Diego Water Board ~~alleges, but the Port District denies,~~ finds that the Port District has discharged urban storm water containing waste directly or indirectly to San Diego Bay at the Shipyard Sediment Site. The waste includes metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total suspended solids, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs).

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

11.1. The Port District May Be Named as a Discharger

The Port District is a special government entity, created in 1962 by the San Diego Unified Port District Act, California Harbors and Navigation Code Appendix I, in order to manage San Diego Harbor, and administer certain public lands along San Diego Bay. The Port District holds and manages as trust property on behalf of the People of the State of California the land occupied by NASSCO, BAE Systems, and the cooling water tunnels for SDG&E's former Silver Gate Power Plant. The Port District is also the trustee of the land formerly occupied by the ~~Star & Crescent Boat Company~~ San Diego Marine Construction Company ~~and its predecessor,~~ and by Campbell ~~Industries~~ at all times since 1963 during which they conducted shipbuilding and repair activities.[102] The San Diego Water Board has the discretion to name the Port District in its capacity as the State's trustee as a "discharger" in the Shipyard Sediment Site CAO and hereby does so, consistent with its responsibility for the actions, omissions and operations of its tenants and to the extent indicated by previous State Water Board and San Diego Water Board orders.

The San Diego Water Board's discretion to hold landowners accountable for discharges which occurred on the landowner's property is based on three criteria. As the State's designated trustee for the relevant lands, the Port District meets all three of these criteria:

- Ownership of the land;
- Knowledge of the activity causing the discharge; and
- The ability to control the activity.[103]

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[102] ~~Star & Crescent Boat Company~~ San Diego Marine Construction Company and Campbell Industries owned and operated ship repair and construction facilities in past years prior to BAE Systems San Diego Ship Repair, Inc.'s occupation of the leasehold. See Sections 5 and 6.

[103] These principles on the issue of landowner liability under both waste discharge requirements and enforcement orders were established in a series of orders adopted by the State Water Resources Control Board and in

It is undisputable that the Port District is the State's designated statutory trustee and that it is responsible for the use and maintenance of the land leased by NASSCO, BAE Systems, and SDG&E, and the land formerly leased by ~~Star & Crescent Boat Company~~San Diego Marine Construction Company and Campbell Industries. The Port District has responsibility for land use on these lands and can control decisions regarding the use and sizing of facilities located on lands under its jurisdiction. The Port District has, through its interactions with the San Diego Water Board over many years, and otherwise, known of the potential for discharges from the NASSCO, BAE Systems, ~~Star & Crescent Boat~~ San Diego Marine Construction Company, Campbell Industries, and SDG&E facilities to contribute to accumulations of pollutants in San Diego Bay sediment to deleterious levels. Finally, it is also clear that the Port District has, and at all times relevant had, the obligation and ability under its lease agreements with these entities to impose controls that could prevent or reduce waste discharges. (See e.g. Port District Ordinance No. 62.)

In years past, the State Water Board examined the terms of a lease in order to ascertain whether the lessor has the legal power to prevent a discharge.[104] In Order No. WQ 84-6 (page 12), for example the State Water Board concluded that former landowner/lessors had the opportunity to obviate dangerous conditions on their property on the basis of lease provisions stipulating that "the tenant shall not commit waste or nuisance on the premises, and shall obey all laws, state, federal, and local, with respect to the use of the premises." Port District Ordinance No. 62 contains similar provisions. In addition, the State Water Board cited a term of the lease authorizing the landowners to re-enter the premises upon the failure of the tenant to perform any of its obligations under the lease.

Past lease agreements between the Port District and its tenants typically contained terms similar to those discussed in State Water Board Order No. WQ 84-6. For example, Port District leases reviewed by the San Diego Water Board in years past obligated its tenants to "abide by and conform to … any applicable laws of the State of California and Federal Government…." The Port of San Diego's leases required its tenants to keep the leased premises in a clean and sanitary condition, free and clear of waste. The leases authorized the Port District to enter and inspect the leased premises at any time during normal business hours. The leases also authorized the Port District to terminate the lease after 60 days written notice, if the tenant defaulted in the performance of the lease provisions. Under State Water Board Order No. WQ 84-6, these lease terms would provide a sufficient basis for a finding that the Port District had the requisite degree of control over a tenant's activities to name it as a responsible party.

Based upon the three elements of ownership, knowledge of, and the ability to regulate the discharges which occurred during the lease terms, the San Diego Water Board can and hereby does conclude that that the Port District caused or permitted waste to be discharged into San Diego Bay, creating a condition of pollution and/or nuisance in the Bay at the Shipyard Sediment Site, consistent with its responsibility for the actions, omissions and operations of its tenants.

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memoranda issued by the State Board Office of Chief Counsel. (See e.g., State Board Order Nos. WQ 87-6, 87-5, 86-18, 86-16, 86-15, 86-11, 84-6, 90-03; Memorandum dated May 8, 1987 from William R. Attwater to Regional Board Executive Officers entitled "Inclusion of Landowners in Waste Discharge Requirements and Enforcement Orders").

[104] See State Water Resources Control Board Order Nos. WQ 84-6 and 86-15.

Based on these considerations, and to the extent indicated by previous State Water Resources Control Board and San Diego Water Board orders, the Port District is referred to as "Discharger(s)" herein.

11.2. The Port District Should Not Bear Merely Secondary Responsibility at this Time

In certain situations, the State Water Board has found it appropriate to consider a lessee primarily responsible and the lessor secondarily responsible for compliance with a cleanup and abatement order. A secondarily responsible party is one that is not obligated to comply with the cleanup and abatement order unless the primarily responsible party fails to do so. State Water Board Orders WQ 86-10 and 87-6 identified factors that should be considered in determining whether it is appropriate to assign secondary liability to the Port District for compliance with the Cleanup and Abatement Order. These factors include:

- The status of the lessee's compliance with the Order;
- The ability of the lessor to control the property, including the status of the lease agreement, the authority of the lessor under the lease, and the lessor's current ability to conduct the cleanup; and
- The lessor's role, if any, in the discharge of waste.

In general, the State Water Board Orders held that a landowner or lessor party may be placed in a position of secondary liability where it did not cause or permit the activity that led to the initial discharge into the environment and there is a primarily responsible party who is performing the cleanup. Other factors considered by the State Water Board include whether the landowner or lessor:

- Is a public entity that should be treated in a manner similar to the U.S. Forest Service in State Water Board Order No. WQ 87-05;
- Has a limited ability to conduct cleanup because another party has control over the site; and
- Contributed to or aggravated pollution conditions at the site.

The San Diego Water Board concludes that the Port District should be named as a "discharger" in the CAO consistent with its responsibility for the actions, omissions and operations of its tenants to the extent indicated by previous State Water Resources Control Board and San Diego Water Board orders. Although the Port District is a public government entity,[105] and there is no evidence in the record that the Port District initiated or contributed to the actual discharge of waste to the Shipyard Sediment Site, it is nevertheless appropriate to name the Port District as a discharger in the CAO to the extent the Port's tenants, past and present, have insufficient

[105] See ~~California~~ Harb.~~ors~~ and ~~Navigation~~ Nav. Code, Appendix I, section 28.

financial resources to cleanup the Shipyard Sediment Site and/or fail to comply with the order. (See egs. In the Matter of Petitions of Wenwest, Inc., et al., State Water Board Order No. WQ 92-13, p. 9; In the Matter of the Petitions of Arthur Spitzer, et al., State Water Board Order No. WQ 89-8, p. 21.) In the event the Port District's tenants, past and present, have sufficient financial resources to clean up the Shipyard Sediment Site and comply with the Order, then the San Diego Water Board may modify its status to secondarily responsible party in the future.

11.3. The San Diego Unified Port District Operates a Municipal Separate Storm Sewer System (MS4) Through Which It Discharges Urban Runoff

The San Diego Unified Port District (Port District) operates a municipal separate storm sewer system (MS4) through which it discharges waste commonly found in urban runoff to San Diego Bay subject to the terms and conditions of a NPDES Storm Water Permit (Order No. R9-2007-0001 NPDES No. CAS0108758). The Port District is the trustee of the tidelands property and lessor of the BAE Systems leasehold and NASSCO leasehold. The Port District is a co-permittee of current and prior NPDES Storm Water Permits which regulate the MS4 drains which outfall on the BAE Systems and NASSCO leaseholds as well as drains on other tidelands property over which the Port District is trustee. The permits specifically regulate the watershed of the Port District and the Port District is subject to all of the terms and conditions of the permits as an operator of the MS4 system.

The Port District's own ordinances, which date back to 1963, prohibit the deposit or discharge of any chemicals or waste to the tidelands or San Diego Bay and make it unlawful to discharge pollutants in non-storm water directly or indirectly into the storm water conveyance system.

The San Diego Water Board ~~alleges, but the Port District denies,~~ finds that the Port District has discharged urban storm water containing waste directly to San Diego Bay at the Shipyard Sediment Site through its MS4 conveyances. 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 SW4 (located on the BAE Systems leasehold) and SW9 (located on the NASSCO leasehold) MS4 conduit pipes as well as other minor drains on its tidelands property and watershed to the Shipyard Sediment Site.

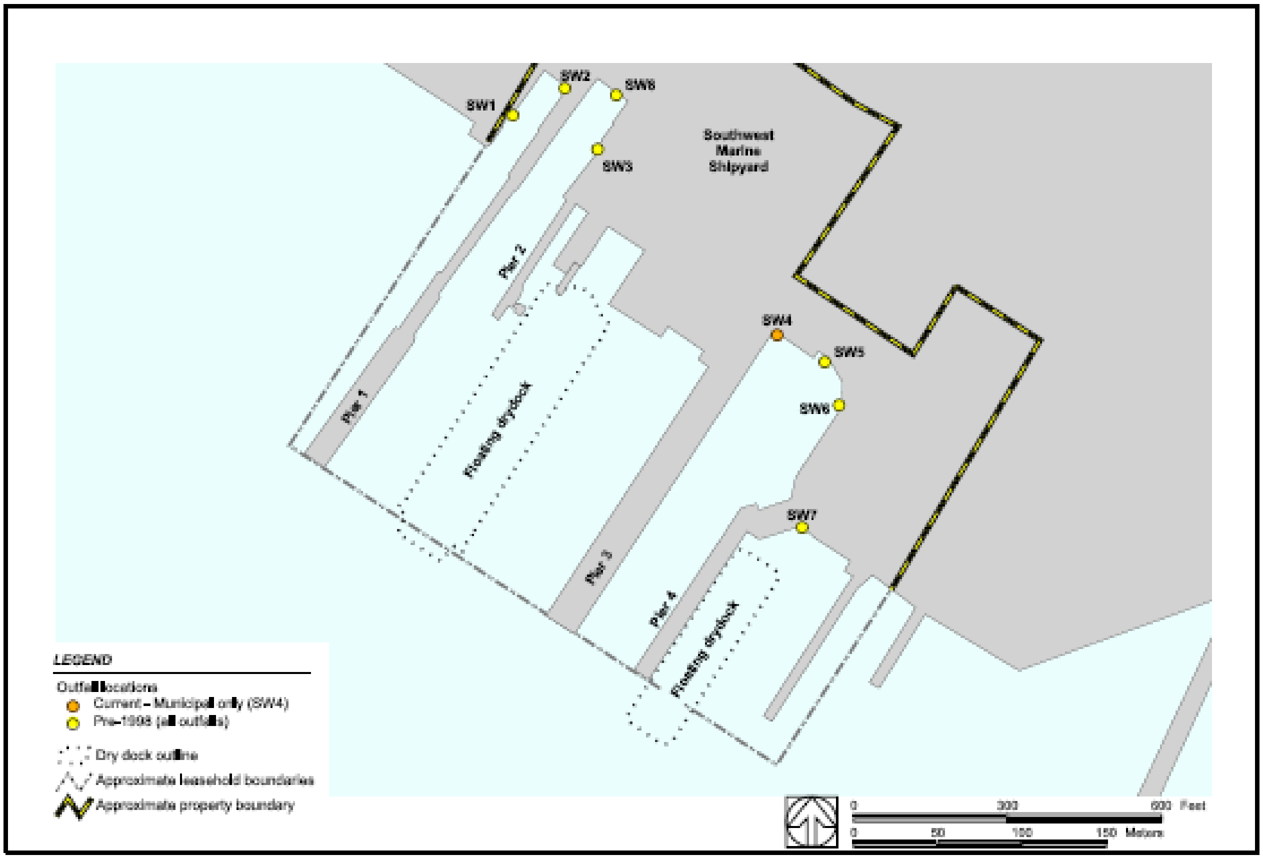
11.3.1. MS4 Description

The Port District operates an MS4 conveyance through which it discharges urban runoff into waters of the United States within the San Diego Region. The Port District's MS4 conveys urban runoff from the urbanized and largely industrial tidelands area storm drain structures and storm drain pipes that discharge into the Shipyards Site and greater San Diego Bay.

The Port District operates an ~~the following~~ MS4 ~~storm drains which~~ that conveys urban runoff from source areas up-gradient of the Shipyard Sediment Site's property and discharge ~~directly or~~ indirectly into San Diego Bay within the NASSCO and BAE Systems leasehold or directly through the following outfalls:

- **Storm Drain SW4**
  The storm drain outfall identified as SW4 in the Shipyard Report (Exponent, 2003) enters BAE Systems leasehold with two contributing storm pipes located at the foot of Sampson and Sicard Streets. These pipes join together somewhere beneath BAE Systems' leasehold, ultimately discharging into San Diego Bay at the SW4 outfall located at a point between Piers 3 and Pier 4 on the BAE Systems leasehold[106] at the Shipyard Sediment site. This storm drain receives runoff from Sicard, Belt, and Sampson streets and had historically received runoff directly from areas within the current BAE leasehold. Figure 11-1 shows the storm drain outfalls at the BAE Systems' leasehold.

Figure 11-1 Storm Drain Outfalls at BAE Systems' Leasehold

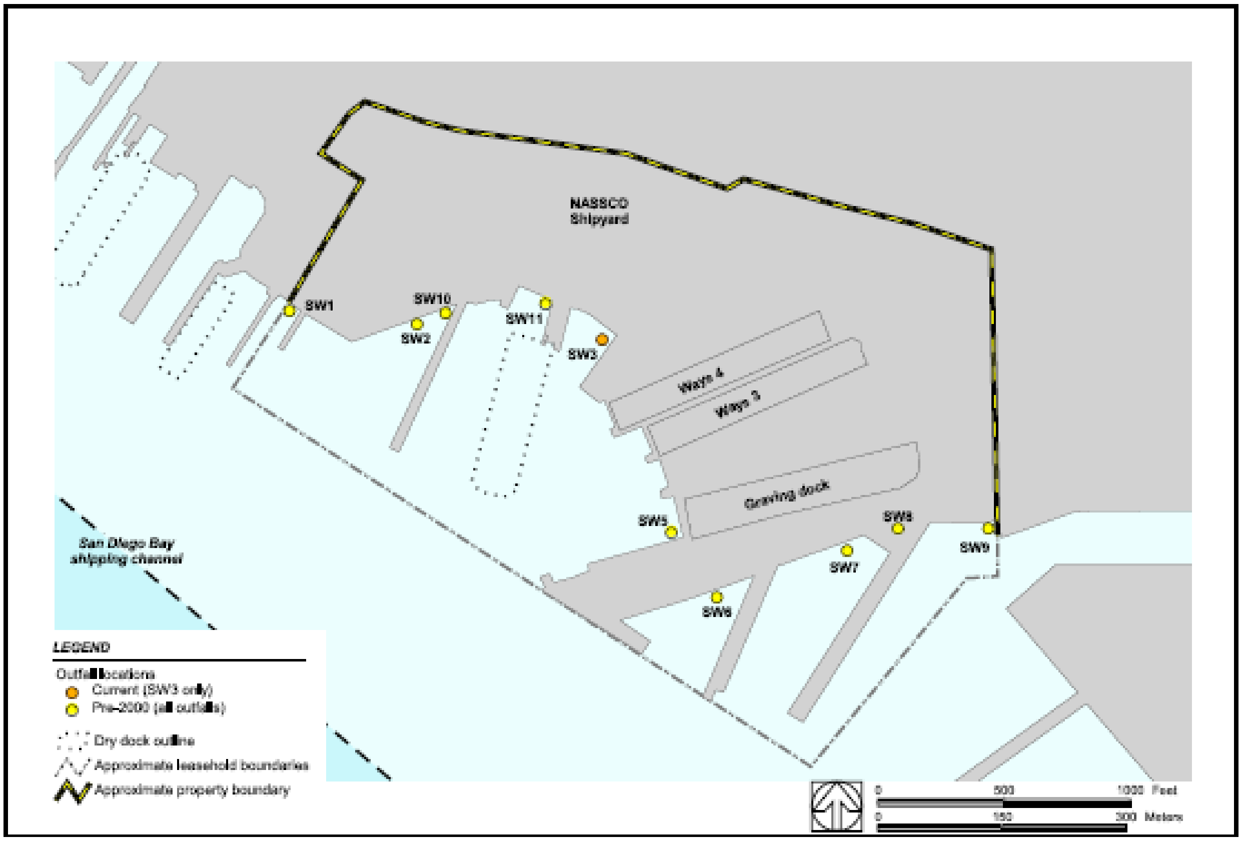


(Exponent, 2003)

106 A 1968 City of San Diego drainage easement figure shows a 42-inch storm drain, discharging into the Bay between Piers 3 and 4. No further information was provided by the City of San Diego concerning the SW4 outfall.

- **Storm Drain SW9**
  This storm drain outfall is identified as SW9 in the Shipyard Report (Exponent, 2003) and enters NASSCO's leasehold at the foot of 28th Street and discharges at the southeasterly corner of the leasehold into Chollas Creek, a tributary of San Diego Bay. (Exponent, 2003; ENV America, 2004a; City of San Diego, 2004a) Storm Drain SW9 collects flow from 28th Street, and stretches from the I-5 freeway to the bay including parts of Belt Street and Harbor Drive and historically received runoff from areas within the current NASSCO leasehold. Figure 11-2 shows the storm drain outfalls at NASSCO's leasehold.

Figure 11-2 Storm Drain Outfalls at NASSCO's Leasehold



(Exponent, 2003)

11.3.2. Urban Runoff is a "Waste" and a "Point Source Discharge" of Pollutants

Urban runoff is a waste, as defined in the ~~CWC~~ Water Code that contains pollutants and adversely affects the quality of the waters of the state.[107] The discharge of urban runoff from an MS4 conveyance is a "discharge of pollutants from a point source" into waters of the United States as defined in the Clean Water Act~~WA~~.[108]

The most common categories of pollutants in urban runoff include total suspended solids (TSS), sediment (due to anthropogenic activities), pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., copper, lead, zinc, and cadmium), petroleum products and polynuclear aromatic hydrocarbons (PAHs and HPAHs), synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash.[109]

11.4. The Port District Discharged Waste to San Diego Bay

The Port District has caused or permitted the discharge of urban storm water pollutants directly to San Diego Bay at the Shipyard Sediment Site. The pollutants include metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), TSS, 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, as well as other minor drains on its tidelands property and watershed to the Shipyard Sediment Site

Urban runoff discharges from the Port District are regulated under NPDES requirements prescribed by the San Diego Water Board pursuant to CWA section 402 and ~~CWC~~ Water Code section 13376. The Port District must comply with all conditions of the NPDES requirements. Any noncompliance of NPDES requirements constitutes a violation of the CWA and ~~CWC~~ Water Code and is grounds for enforcement action, including the issuance of a cleanup and abatement order under the circumstances described in ~~CWC~~ Water Code section 13304. ~~CWC~~ Water Code section 13304 contains the cleanup and abatement authority of the San Diego Water Board. Section 13304(a) provides, in relevant part, that the San Diego Water Board may issue a

[107] See ~~California~~ Wat.~~er~~ Code ~~(CWC)~~, § ~~Section~~ 13050, subd. (d). Waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.

[108] 40 CFR 122.2 defines "point source" as "any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff." 40 CFR 122.2 defines "discharge of a pollutant" as "Any addition of any 'pollutant' or combination of pollutants to 'waters of the United States' from any point source."

[109] Finding 7 of Order No. 2001-001, NPDES No. CAS0108758, Waste Discharge Requirements For Discharges Of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District.

cleanup and abatement order to any person "who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement…."

The Port District's NPDES Permit requirement urban runoff discharges are documented in the San Diego Water Board records via monitoring reports (filed by the *San Diego County Municipal Copermittees*).

11.5. The Port District Discharged Waste to San Diego Bay Creating Pollution, Contamination, and Nuisance Conditions in San Diego Bay

The Port District has contributed to the accumulation of pollutants in marine sediment at the Shipyard Sediment Site by discharging urban storm water pollutants from MS4 discharges at levels, which cause, and threaten to cause, conditions of pollution, contamination, and nuisance by exceeding applicable water quality objectives for toxic pollutants in San Diego Bay. ~~CWC~~ Water code section 13304 requires that any person who causes any waste to be discharged, or deposited where it probably will be discharged, into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance is subject to cleaning up or abating the effects of the waste.

The Porter-Cologne Water Quality Act defines "pollution" as "an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects … the waters for beneficial uses…."[110] "Contamination" is defined as "an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."[111]

Pollutants conveyed and discharged by the MS4 conveyance include metals, TSS, sediment, petroleum products, pesticides, herbicides, and PCBs. Many of these same pollutants are present in marine sediment at the Shipyard Sediment Site in highly elevated concentrations as compared to sediment chemistry levels found at off-site reference stations located in areas of San Diego Bay.[112]

As stated above, since 1990 the Port District's NPDES requirements have specifically prohibited urban runoff discharges that cause pollution, contamination or nuisance conditions in San Diego Bay or otherwise cause or contribute to violations of San Diego Bay water quality standards.

Based on the evidence presented in Section 11.4 of this Technical Report, the Port District has a history of discharging pollutants ~~from~~ through MS4 Storm Drains SW4, SW9, and other minor drains on its tidelands property and watershed to the Shipyard Sediment Site at levels that have contributed to a condition of pollution, contamination, or nuisance at the Shipyard Sediment Site.

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110 ~~Water~~ Wat. Code, § ~~section~~ 13050, subd. (l).

111 ~~Water~~ Wat. Code, § ~~section~~ 13050, subd. (k).

112 See Section 15 of this Technical Report.

As described in Sections 13 through 30 of this Technical Report these same pollutants in the discharges have accumulated in San Diego Bay sediment at levels that may:

14. Adversely affect the beneficial uses of San Diego Bay, violating a NPDES requirement prohibitions pertaining to discharges that cause pollution, contamination, or nuisance conditions in San Diego Bay; and

15. Violate NPDES requirements pertaining to discharges that degrade marine communities, cause adverse effects on the environment or the public health, or result in harmful concentrations of pollutants in marine sediment.

Accordingly, it is concluded that the Port District has caused or permitted the discharge of waste to San Diego Bay in a manner causing the creation of pollution or nuisance conditions and that it is appropriate for the San Diego Water Board to issue a cleanup and abatement order naming the Port District as a discharger pursuant to ~~CWC~~ Water Code section 13304.[113]

11.6. NPDES Requirement Regulations & Port District Ordinances

Urban runoff discharges from the Port District's MS4 are regulated under NPDES requirements prescribed by the San Diego Water Board pursuant to ~~CWA~~ Clean Water Act section 402 and ~~CWC~~ Water Code section 13376. These requirements are referred to as either NPDES requirements[114] or by the federal terminology "NPDES Permit." The Port District's first NPDES requirements started in 1990, when the San Diego Water Board issued WDRs for storm water and urban runoff. A listing of the successive NPDES requirements adopted by the San Diego Water Board to regulate the Port District's MS4 Urban Runoff discharges is provided in Table 11-1 below.

[113] The Port District asserts that under the Ninth Circuit opinion in Natural Resources Defense Council, Inc. v. County of Los Angeles, 636 F.3d 1235 (9th Cir. 2011) (NRDC Case), there is insufficient evidence in the record to support naming the Port District as a Discharger based upon urban runoff discharges. For the reasons stated in the San Diego Water Board Cleanup Team's Response to Comments Report, the NRDC Case is not applicable because it focused on whether an NPDES permittee had violated its NPDES permit limits. The weight of the evidence in this record supports finding that the Port District discharged waste to the Shipyard Sediment that caused a condition of pollution or nuisance. (See Response to Comments Report, August 23, 2011, pp. 11-16 through 11-17).

[114] Pursuant to Chapter 5.5 of the Porter-Cologne Water Quality Act, to avoid the issuance by the United States Environmental Protection Agency of separate and duplicative NPDES permits for discharges in California that would be subject to the Clean Water Act, the State's Waste Discharge Requirements (WDRs) for such discharges implement the NPDES regulations and entail enforcement provisions that reflect the penalties imposed by the Clean Water Act for violation of NPDES permits issued by the U.S. EPA. Thus, the State's WDRs that implement federal NPDES regulations (NPDES requirements) serve in lieu of NPDES permits.

Table 11-1 Port District NPDES Permits

Order Number / NPDES No.	Order Title	Adoption Date	Expiration Date
Order No. 90-42 NPDES No. CA0108758	Waste Discharge Requirements For Storm water and Urban Runoff from the County of San Diego the Incorporated Cities of San Diego County and the San Diego Unified Port District	July 16, 1990	February 21, 2001
Order No. 2001-01, NPDES No. CAS0108758	Waste Discharge Requirements For Discharges Of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cites of San Diego County, and the Unified Port District	February 21, 2001	Present
Order No. 2007-001, NPDES No. CAS0108758	Waste Discharge Requirements For Discharges Of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cites of San Diego County, and the Unified Port District	January 24, 2007	Present

The Port District must comply with all conditions of the NPDES requirements. Any noncompliance of NPDES requirements constitutes a violation of the CWA and ~~CWC~~ Water Code and is grounds for enforcement action, including the issuance of a cleanup and abatement order under the circumstances described in ~~CWC~~ Water Code section 13304.

Each of the Port District's successive NPDES requirements described here has specifically prohibited urban runoff discharges that cause pollution, contamination or nuisance conditions in San Diego Bay, or otherwise cause or contribute to violations of San Diego Bay water quality standards.

11.6.2. Order No. 90-42, NPDES No. CA0108758

Order 90-42, NPDES No. CA0108758, in effect from July 16, 1990 to February 21, 2001, contains the following narrative limits that relate to the discussions contained herein:

- VIII. ILLICIT CONNECTION/ILLEGAL DUMPING DETECTION PROGRAM B. The permittee shall effectively eliminate all identified illegal/illicit discharges in the shortest time practicable, and in no case later than July 16, 2005 … …If it is determined that any of the preceding discharges cause or contribute to violations of water quality standards or are significant contributors of pollutants to waters of the United States, the discharges shall be prohibited ~~form~~ from entering storm water conveyance systems; and

- XIII. PROVISIONS A. Neither the treatment nor the discharge of pollutants shall create a pollution, contamination, or nuisance as defined by section 13050 of the CWC.

11.6.3. Order No. 2001-01, NPDES No. CAS0108758

Order No. 2001-01, NPDES No. CAS0108758, in effect from February 21, 2001 contains the following provisions that relate to the discussions contained herein:

- A. PROHIBITIONS – DISCHARGES … 1. Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC § 13050), in waters of the state are prohibited.

- A. PROHIBITIONS DISCHARGES … 2. Discharges from MS4s which cause or contribute to exceedances of receiving water quality objectives for surface water or groundwater are prohibited.

- C. RECEIVING WATER LIMITATIONS … 1. Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) are prohibited.

11.6.4. Order No. 2007-0001, NPDES No. CAS0108758

Order No. 2007-0001, NPDES No. CAS0108758, in effect from January 24, 2007 contains the following provisions that relate to the discussions contained herein:

- A. PROHIBITIONS AND RECEIVING WATER LIMITATIONS… 1. Discharges into and from municipal separate storm sewer systems (MS4s) in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state are prohibited.

- A. PROHIBITIONS AND RECEIVING WATER LIMITATIONS … 3. Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) are prohibited.

The above NPDES requirement narrative limits are applicable to urban runoff discharges to San Diego Bay from the Port District MS4 Storm Drains SW4, SW9, and other minor drains on the Port District's tidelands property at the Site, which occurred during the effective terms of Order Nos. 90-42, 2001-01, and 2007-0001.

Additionally, the Port District's own ordinances, which date back to 1963, also prohibit the deposit or discharge of any chemicals or waste to the tidelands or San Diego Bay.[115] The Port District's ordinances make it unlawful to discharge pollutants in non-storm water directly or indirectly into storm water conveyance systems or receiving waters.[116] It is specifically among the powers of the Port District to "protect, preserve and enhance" the "natural resources of the

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[115] Ordinance No. 62, "An Ordinance Regulating Disposal of Refuse and Dumping on the Tidelands and into the Bay of San Diego; Amending Port District Code by adding § 8.50 (May 1963) (See § 8.50 (b), (c)).

[116] Article 10, San Diego Unified Port District Stormwater Management & Discharge Control, § 10.05. Prohibitions, San Diego Unified Port District code (26Sep2011)

Bay" and "the quality of water in the Bay."[117] The Port District has been charged with making and enforcing all necessary rules and regulations governing the use and control of the Bay waters and tidelands, including making and enforcing any local sanitary regulations relating to public services and public utilities in the District, which would include municipal storm water systems, since the San Diego Unified Port District Act was enacted in 1962.[118]

11.6.5. Port District, MS4 Storm Drain SW4

As described in Section 11.3.1, the Port District operates an MS4 storm drain identified as SW4 in the Shipyard Report (Exponent, 2003) (see Figure 11-1 above) which conveys urban runoff from source areas upgradient of BAE Systems and historically from BAE Systems' property and discharges(d) directly within the BAE Systems leasehold. Urban runoff discharged into the SW4 storm drain outfall is subject to the NPDES requirements cited in Section 11.6. Although no monitoring data is available for this outfall, it is highly probable that historical and current discharges from this outfall have discharged heavy metals and organics to San Diego Bay at the Shipyard Sediment Site.[119]

The Storm Drain SW4 discharges into the BAE Systems leasehold between Piers 3 and 4. Sample stations from the Detailed Sediment Investigation (Exponent, 2003) in the area of this outfall include SW20 through SW25. The sample results for PCBs and PAHs are presented in Table 11-2.

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[117] Harbors & Navigation Code, Appx. § 4.

[118] San Diego Unified Port District Act, §§ 55, 56.

[119] See Section Figure 0-132483072 for a description of the most common categories of pollutants found in urban runoff.

Table 11-2 NASSCO & BAE Systems Detailed Sediment Investigation PCB and PAH Results for SW20 through SW25

Constituent	SW20 µg/kg	SW21 µg/kg	SW22 µg/kg	SW23 µg/kg	SW24 µg/kg	SW25 µg/kg
Aroclor-1016	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1221	< 500	< 520	< 57	< 58	< 460	< 51
Aroclor-1232	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1242	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1248	< 250	< 260	< 29	< 29	< 230	< 26
Aroclor-1254	1,500	1,600	670	550	790	330
Aroclor-1260	1,600	1,800	790	710	870	380
Sum of Aroclors®	**3,100**	**3,400**	**1,500**	**1,300**	**1,700**	**710**
Naphthalene[1]	< 13	13	31	< 15	26	< 13
Acenaphthylene[1]	120	130	150	130	290	180
Acenaphthene[1]	16	14	17	19	14	13
Fluorene[1]	53	53	56	53	220	45
Phenanthrene[1]	300	220	330	360	810	260
Anthracene[1]	450	370	500	500	6,000	440
Fluoranthene[2]	930	580	910	960	7,100	750
Pyrene[2]	1,200	850	1,100	1,000	3,100	940
Benzo [a] Anthracene[2]	760	650	890	850	6,300	710
Chrysene[2]	1,800	1,400	1,900	1,800	11,000	1,300
Benzo [b] Fluoranthene[2]	1,500	1,600	1,800	1,500	7,000	2,000
Benzo [k] Fluoranthene[2]	1,200	1,100	1,300	1,200	7,300	1,600
Benzo [a] Pyrene[2]	1,400	1,500	1,700	1,500	8,800	2,000
Dibenz [a,h] Anthracene[2]	200	210	230	220	1,100	240
Benzo [g,h,i] Perylene[2]	770	780	830	820	2,800	800
Indeno [1,2,3-c, d] Pyrene[2]	970	990	1,100	1,000	3,700	1,100
Total PAHs	**11,669**	**10,460**	**12,844**	**11,912**	**65,560**	**12,378**

1. LPAH – low molecular weight polynuclear aromatic hydrocarbon

2. HPAH – high molecular weight polynuclear aromatic hydrocarbon
Non-detections are represented as less than the quantitation limit.
(Exponent, 2003)

PCBs in sediment from the laterals and catch basin of the storm water conveyance system were found at levels that exceed the ERL and ERM of 22.7 µg/kg and 180 µg/kg, respectively (Long et al., 1995), as well as the proposed Alternative Sediment Cleanup Levels.

Sediment PCB levels, specifically Aroclor-1254 and 1260, and sediment PAH levels reported in the storm water conveyance system are also reported in the bay sediment near the storm water outfall as indicated in Table 11-2.

As outlined above, SW4 has discharged pollutants, specifically Aroclor-1254 and 1260, and PAHs, into the BAE Systems leasehold and San Diego Bay at the Shipyard Sediment Site, for which the Port District is required under its NPDES permit and by its own ordinances to prevent. These facts provide evidence that the Port District has discharged and deposited pollutants to the Shipyard Sediment Site.

11.6.6. Port District, MS4 Storm Drain SW9

As described in Section 11.3.1, the Port District operates an MS4 storm drain identified as SW9 in the Shipyard Report (Exponent, 2003) (see Figure 11-2, above), which conveys urban runoff from source areas upgradient of NASSCO's property and historically from areas within the current NASSCO leasehold and discharges(d) directly within the NASSCO leasehold. Urban runoff discharged into the SW9 storm drain outfall is subject to the NPDES requirements cited in Section 11.6. Although no monitoring data is available for this outfall, it is highly probable that historical and current discharges from this outfall have discharged heavy metals and organics to San Diego Bay at the Shipyard Sediment Site.[120]

A review of maps of the storm drain outfalls shows that the storm drain SW9 outfall is located in the NASSCO leasehold at the foot of 28th St. near the mouth of Chollas Creek (Exponent, 2003; ENV America, 2004a; City of San Diego, 2004a). SW9 collects flow from 28th Street, and stretches from the I-5 freeway to the bay including parts of Belt Street and Harbor Drive.

Surface sediment data at NASSCO sample station NA22, which is located near the SW9 storm drain outfall shows elevated concentrations of total high-molecular-weight polynuclear aromatic hydrocarbons (Total HPAHs) at 3600 µg/kg), Dichlorodiphenyltrichloroethane (DDT) at 29.7 µg/kg), and Chlordane at 21.1 µg/kg. These pollutant levels are indicators of an urban runoff source (Exponent, 2003) and therefore indicate that historical urban runoff discharges occurred from the Port District's tidelands via the SW9 outfall.

As described above, the surface sediment data at NASSCO sample station NA22 provides evidence that the Storm Drain SW9 conveys the HPAHs pollutants into the NASSCO leasehold and San Diego Bay at the Shipyard Sediment Site and the Port District under its NPDES permit

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[120] See Section 1.3.2 for a description of the most common categories of pollutants found in urban runoff.

and by its own ordinances is responsible for preventing those discharges. The urban runoff characteristics of the sediment pollutants at Station NA22 adjacent to the Storm Drain SW9 provide evidence that the Port District has discharged pollutants to the Shipyard Sediment Site. The weight of evidence suggests that there are discharges from Storm Drain SW9 that are contributing to the accumulation of pollutant in marine sediment.